[MS-XLSX]:

Excel (.xlsx) Extensions to the Office Open XML SpreadsheetML File Format

Revision Summary

Date	Revision History	Revision Class	Comments
7/13/2009	0.1	Major	Initial Availability
8/28/2009	0.2	Editorial	Revised and edited the technical content
11/6/2009	0.3	Editorial	Revised and edited the technical content
2/19/2010	1.0	Major	Updated and revised the technical content
3/31/2010	1.01	Editorial	Revised and edited the technical content
4/30/2010	1.02	Editorial	Revised and edited the technical content
6/7/2010	1.03	Editorial	Revised and edited the technical content
6/29/2010	1.04	Editorial	Changed language and formatting in the technical content.
7/23/2010	1.04	None	No changes to the meaning, language, or formatting of the technical content.
9/27/2010	1.04	None	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	1.04	None	No changes to the meaning, language, or formatting of the technical content.
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3/18/2011	1.5	Minor	Clarified the meaning of the technical content.
6/10/2011	1.5	None	No changes to the meaning, language, or formatting of the technical content.
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7/16/2012	3.0	Major	Significantly changed the technical content.
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2/11/2013	4.1	Minor	Clarified the meaning of the technical content.
7/30/2013	4.1	None	No changes to the meaning, language, or formatting of the technical content.
11/18/2013	4.2	Minor	Clarified the meaning of the technical content.
2/10/2014	4.2	None	No changes to the meaning, language, or formatting of the technical content.
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7/31/2014	5.0	Major	Significantly changed the technical content.
10/30/2014	5.1	Minor	Clarified the meaning of the technical content.
3/16/2015	6.0	Major	Significantly changed the technical content.

Date	Revision History	Revision Class	Comments
9/4/2015	7.0	Major	Significantly changed the technical content.
9/29/2016	7.1	Minor	Clarified the meaning of the technical content.
11/14/2016	7.1	None	No changes to the meaning, language, or formatting of the technical content.
1/18/2017	8.0	Major	Significantly changed the technical content.
6/20/2017	8.0	None	No changes to the meaning, language, or formatting of the technical content.
12/12/2017	9.0	Major	Significantly changed the technical content.
4/27/2018	10.0	Major	Significantly changed the technical content.
5/9/2018	11.0	Major	Significantly changed the technical content.
6/8/2018	12.0	Major	Significantly changed the technical content.
8/1/2018	13.0	Major	Significantly changed the technical content.
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10/10/2018	15.0	Major	Significantly changed the technical content.
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1/11/2019	17.0	Major	Significantly changed the technical content.
3/19/2019	17.1	Minor	Clarified the meaning of the technical content.
11/19/2019	18.0	Major	Significantly changed the technical content.
2/19/2020	19.0	Major	Significantly changed the technical content.
10/15/2020	20.0	Major	Significantly changed the technical content.
4/22/2021	21.0	Major	Significantly changed the technical content.
8/17/2021	22.0	Major	Significantly changed the technical content.
11/16/2021	23.0	Major	Significantly changed the technical content.
2/15/2022	23.0	None	No changes to the meaning, language, or formatting of the technical content.
5/17/2022	23.1	Minor	Clarified the meaning of the technical content.

Table of Contents

1   Introduction

The Excel (.xlsx) Extensions to the Office Open XML SpreadsheetML File Format specifies extensions to the Office Open XML file formats described in [ISO/IEC29500-1:2016]. The extensions are specified using conventions provided by the Office Open XML file formats described in [ISO/IEC29500-3:2015]. The extensions are a collection of structures and parts in a container that specify appropriate content, which can include unstructured or semi-structured tables of numbers, text, or both numbers and text, equations or functions, external **data connections**, charts, and images. Content in such a container is typically organized in a grid-based layout, and often includes numeric data, structured data, and formulas.

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

1.1   Glossary

This document uses the following terms:

add-in: Supplemental functionality that is provided by an external application or macro to extend the capabilities of an application.

adjacent cell: A cell that is in the same row as and adjoins the current cell in a worksheet.

attribute: A characteristic of some object or entity, typically encoded as a name/value pair.

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

AutoComplete: A feature that suggests text automatically based on the first few characters that a user types.

AutoFilter: A mechanism that can be used to filter tabular data based on user-defined criteria such as values, strings, and formatting.

binary large image or picture (BLIP): A binary data structure that stores information about a metafile image or bitmap picture.

Boolean: An operation or expression that can be evaluated only as either true or false.

bottom N filter: A filter that matches the smallest numerical values or oldest time and date values in a specified range.

calculate: The process by which computations in a workbook are performed.

calculated column: A **column** in a table that contains a formula that is copied automatically to each record in the column.

cell: A box that is formed by the intersection of a **row** and a **column** in a worksheet or a table. A cell can contain numbers, strings, and formulas, and various formats can be applied to that data.

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

cell reference: A set of coordinates that a cell occupies on a worksheet. For example, "B3" is the reference of a cell that appears at the intersection of column "B" and row "3".

cell value: The text or numeric content of a cell, or the results of a formula. A cell value does not include a formula expression, cell formatting, or other metadata.

character set: A mapping between the characters of a written language and the values that are used to represent those characters to a computer.

color scale: A specific range of colors that is used to give additional meaning to data by assigning certain values to colors in the spectrum.

column: A single set of data that is displayed vertically in a worksheet or a table.

comment: An annotation that is associated with a cell, text, or other object to provide context-specific information or reviewer feedback.

comment thread: A collection of annotations that is associated with a cell to provide context-specific information, viewer feedback and collaborative discussion, which is made of a main comment and its replies, if there are any.

condition: A logical expression comparing one or more properties in all incoming Message objects against a set of clauses. This logical expression can evaluate to TRUE or FALSE.

conditional formatting: A mechanism that changes the appearance of a user interface element based on the evaluation of a rule or expression.

control: A graphical user interface object that users interact with when working with applications, forms, documents, webpages, and other types of files.

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

cube function: A function that is used to extract and display Online Analytical Processing (OLAP) data sets and values.

custom filter: A filter that contains preconfigured expressions in which users can optionally enter a string to filter data.

custom list: A user-defined list or enumeration that can be used to sort data in a worksheet.

data bar: A graphical representation of cell content as a bar graph.

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

data marker: A customizable symbol or shape that identifies a data point on a line, scatter, or radar chart. A data marker can be formatted with various sizes and colors.

data point: A representation of a PivotTable item in a PivotTable data field contained in a PivotChart report.

data provider: A known data source that is specific to a target type and that provides data to a collector type.

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

data table: A range of cells that is designated to perform what-if analysis for formulas, based on various input values.

data type: A property of a field that defines the kind of data that is stored in the field, or defines the kind of data returned by an expression when the expression is evaluated.

data validation: The process of testing the accuracy of data; a set of rules that specify the type and range of data that users can enter.

defined name: A word or string of characters in a formula that represents a cell, range of cells, formula, or constant value.

descendant: A member that is below the current member in a hierarchy.

dimension: A structural attribute of a cube, which is an organized hierarchy of categories (levels) that describe data in a fact table. These categories typically describe a similar set of members upon which the user bases an analysis.

display folder: A folder into which attributes, measures, calculated members, and key performance indicators can be organized to facilitate browsing.

drillthrough: A query that is used to retrieve individual records that were used to calculate an aggregate value.

dynamic array: An array resulting from a formula whose dimensions may change when the formula is evaluated.

email address: A string that identifies a user and enables the user to receive Internet messages.

English Metric Unit (EMU): A measurement in computer typography. There are 635 EMUs per twip, 6,350 EMUs per half-point, 12,700 EMUs per point, and 914,400 EMUs per inch. These units are used to translate on-screen layouts to printed layouts for specified printer hardware.

field: An element or **attribute** in a data source that can contain data.

filter: A mechanism by which a set of data is scoped to display only those entries that meet specified logical criteria.

formula: A logical equation or function that produces a result in a spreadsheet application.

future function: A function that can be written to but is not implemented in a file.

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

hash: A fixed-size result that is obtained by applying a one-way mathematical function, which is sometimes referred to as a hash algorithm, to an arbitrary amount of data. If the input data changes, the hash also changes. The hash can be used in many operations, including authentication and digital signing.

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

hierarchy: A logical tree structure that organizes the members of a dimension such that each member has one parent member and zero or more child members.

icon: A graphical image used to supplement alphanumeric text in the visual identification of an object on a computer monitor. **Icons** are typically small, relative to the size of the area on which they are displayed.

icon set: A collection of icons that can be used to comment and classify data into categories.

Input Method Editor (IME): An application that is used to enter characters in written Asian languages by using a standard 101-key keyboard. An IME consists of both an engine that converts keystrokes into phonetic and ideographic characters and a dictionary of commonly used ideographic words.

key value pair (KVP): A set of two linked data items: a key that is an identifier for some data item, and a value that is a value associated with the data item for the identifier represented by the key.

left-to-right: A reading order in which characters in words are read from left to right, and words are read from left to right in sentences.

locale: A collection of rules and data that are specific to a language and a geographical area. A locale can include information about sorting rules, date and time formatting, numeric and monetary conventions, and character classification.

locked: The condition of a cell, worksheet, or other object that restricts edits or modifications to it by users.

MDX unique name: A unique identifier for a multidimensional expression (MDX) member or value in a given Online Analytical Processing (OLAP) cube, for example "[Customer].[Customer Geography].[Country].&[Australia]".

measure: In a cube, a set of values that are typically numeric and are based on a column in the fact table of the cube. Measures are the central values that are aggregated and analyzed.

mention: A part of a threaded comment that provides a reference to a person's information.

Multidimensional Expressions (MDX): A syntax that is used for defining multidimensional objects, and for querying and manipulating multidimensional data.

named sheet view: A named set of sort and/or filter conditions that can be easily restored onto a given sheet.

nsvfilter: A set of sort and/or filter conditions associated with a single autofilter. Part of a named sheet view.

Object Linking and Embedding (OLE): A technology for transferring and sharing information between applications by inserting a file or part of a file into a compound document. The inserted file can be either embedded or linked. See also embedded object and linked object.

object model: A collection of object-oriented APIs that represent data structures and are designed to promote software interoperability.

OLAP All level: An optional level at the top of a hierarchy. It typically contains an **OLAP All member** that represents an aggregation of all of the lower-level members of that hierarchy.

OLAP All member: A multidimensional expression (MDX) that evaluates a hierarchy and returns a set that contains all of the members of the specified hierarchy.

OLAP allocation: An operation in which the values for members at lower levels in an **OLAP hierarchy** are changed based on changes to values for members at higher levels in that hierarchy.

OLAP hierarchy: An attribute hierarchy or a user-defined hierarchy in a data structure. By default, each dimension **attribute** has an attribute hierarchy. A user-defined hierarchy is a set of related attribute hierarchies that is used to facilitate browsing an OLAP cube.

OLAP level: Within an **OLAP hierarchy**, a set of data that is organized into a lower or higher level of detail, such as Year, Quarter, Month, and Day levels in a Time hierarchy.

OLAP measure: A set of numeric values in an OLAP cube that is used in aggregation and analysis.

OLAP member: An item that is in an **OLAP level**. For example, a Canada member in a Country level of a Geography hierarchy.

OLAP named set: A collection of **OLAP tuples** that have the same dimensionality. Also referred to as OLAP set.

OLAP subselect: The ability to execute multiple SELECT commands in a FROM clause that is inside a multidimensional expression (MDX) statement.

OLAP tuple: An ordered collection of members that are from different dimensions of an OLAP cube. A single member is a special case of a tuple.

OLAP weight expression: A multidimensional expression (MDX) that is used to apply and allocate modified values to an **Online Analytical Processing (OLAP)** provider. It typically returns a decimal value between "0" and "1".

OLE DB: A set of interfaces that are based on the Component Object Model (COM) programming model and expose data from a variety of sources. These interfaces support the amount of Database Management System (DBMS) functionality that is appropriate for a data store and they enable a data store to share data.

Online Analytical Processing (OLAP): A technology that uses multidimensional structures to provide access to data for analysis. The source data for OLAP is stored in data warehouses in a relational database. See also cube.

PivotTable: An interactive table that summarizes large amounts of data from various sources by using format and calculation methods. Row and column headings can be rotated to view different summaries of the source data, filter the data, or display detail data for specific areas.

PivotTable data field: A PivotTable field that is contained in the PivotTable area where data values are shown.

PivotTable field list: A user interface element that displays a list of all of the fields in a PivotTable report. It can be used to populate a PivotTable report and to manipulate the fields.

pixel: A discrete unit of display on a computer display device.

plot area: A portion of a chart area that contains the plotted data and axes.

point: A unit of measurement for fonts and spacing. A point is equal to 1/72 of an inch.

protection: A mechanism that helps restrict users from making unwanted changes to the data or structure of a workbook.

query table: A two-dimensional table that presents data from an external data source.

range: An addressable region that is in a workbook. A range typically consists of zero or more cells and represents a single, contiguous rectangle of cells on a single sheet.

rich array: A type of rich value data that is a two-dimensional array of values.

rich value: A complex representation of data that contains a **rich value type**, a **rich value fallback**, and a collection of **key value pairs (KVP)**. A rich value can exist as the value of a cell or nested as the value in a key value pair.

rich value data: The value part of the **key value pair (KVP)**.

rich value fallback: A value that will be used for any feature that does not know how to interpret a given **rich value type**.

rich value key: The name of the key in the **key value pair (KVP)**.

rich value key flag: A rich value flag assigned to a particular **rich value key**. Each flag is assigned a Boolean value that indicates particular behaviors for the key.

rich value type: A collection of required **key value pairs (KVP)** and key flag definitions.

right-to-left: A reading and display order that is optimized for right-to-left languages.

root element: The top-level element in an XML document. It contains all other elements and is not contained by any other element, as described in [XML].

row: A single set of data that is displayed horizontally in a worksheet or a table.

salt: An additional random quantity, specified as input to an encryption function that is used to increase the strength of the encryption.

security descriptor: A data structure containing the security information associated with a securable object. A **security descriptor** identifies an object's owner by its security identifier (SID). If access control is configured for the object, its **security descriptor** contains a discretionary access control list (DACL) with SIDs for the security principals who are allowed or denied access. Applications use this structure to set and query an object's security status. The **security descriptor** is used to guard access to an object as well as to control which type of auditing takes place when the object is accessed. The **security descriptor** format is specified in [MS-DTYP] section 2.4.6; a string representation of **security descriptors**, called SDDL, is specified in [MS-DTYP] section 2.5.1.

selected: The condition of a set of items that has focus in a workbook.

service: A process or agent that is available on the network, offering resources or services for clients. Examples of services include file servers, web servers, and so on.

shape: A collection of qualifiers, such as names, and quantifiers, such as coordinates, that is used to represent a geometric object. A shape can be contained in a document, file structure, run-time structure, or other medium.

sheet: A part of an Excel workbook. There are four types of sheets: **worksheet**, macro sheet, dialog sheet, and chart sheet. Multiple sheets are stored together within a workbook.

sort: A process that arranges cells in ascending or descending order, based on cell content.

sort condition: A condition that determines how to sort cells in a range.

sort order: A specific arrangement of cells that is based on cell content. The order can be ascending or descending.

source data: The data that is used as the basis for charts, PivotTable reports, and other data visualization features.

sparkline: A miniature chart that can be inserted into text or embedded in a cell on a worksheet to illustrate highs, lows, and trends in data.

spreadsheet data model: A local **Online Analytical Processing (OLAP)** storage of data used by a spreadsheet application.

style: A set of formatting options that is applied to text, tables, charts, and other objects in a document.

supporting property bag: A set of GLOSSARY: [key value pairs (KVP)]. A supporting property bag can exist as the value of a **rich value** or nested as the value in another supporting property bag.

supporting property bag array: A type of **supporting property bag data** that is a one-dimensional array of values.

supporting property bag data: The value part of the **key value pair (KVP)**.

supporting property bag key: The name of the key in a **key value pair (KVP)**.

table: A list that is defined in a workbook.

threaded comment: A comment in a comment thread. It can be a main comment or a reply.

top N filter: A filter that matches the top or bottom N items or N% of items in a specified **column**.

Unicode: A character encoding standard developed by the Unicode Consortium that represents almost all of the written languages of the world. The **Unicode** standard [UNICODE5.0.0/2007] provides three forms (UTF-8, UTF-16, and UTF-32) and seven schemes (UTF-8, UTF-16, UTF-16 BE, UTF-16 LE, UTF-32, UTF-32 LE, and UTF-32 BE).

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

unique identifier (UID): A pair consisting of a **GUID** and a version sequence number to identify each resource uniquely. The UID is used to track the object for its entire lifetime through any number of times that the object is modified or renamed.

workbook: A container for a collection of **sheets**.

worksheet: A single logical container for a set of tabular data and other objects in a workbook.

XML: The Extensible Markup Language, as described in [XML1.0].

XML namespace: A collection of names that is used to identify elements, types, and attributes in XML documents identified in a URI reference [RFC3986]. A combination of XML namespace and local name allows XML documents to use elements, types, and attributes that have the same names but come from different sources. For more information, see [XMLNS-2ED].

XML schema definition (XSD): The World Wide Web Consortium (W3C) standard language that is used in defining XML schemas. Schemas are useful for enforcing structure and constraining the types of data that can be used validly within other XML documents. XML schema definition refers to the fully specified and currently recommended standard for use in authoring XML schemas.

XOR obfuscation: A type of file encryption that helps protect private data by using an exclusive or bitwise operation. This is done by adding a mathematical expression that prevents a simple reverse-engineering process.

zoom level: The degree to which a portion of an image, document, or other screen object is made to appear closer or farther away relative to its default appearance. This value is usually expressed as a percentage of the default appearance.

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

1.2   References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the Errata.

1.2.1 Normative References

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

[CSS-Level2-2009] World Wide Web Consortium, "Cascading Style Sheets Level 2 Revision 1 (CSS 2.1) Specification", W3C Candidate Recommendation 08 September 2009, http://www.w3.org/TR/2009/CR-CSS2-20090908/

[ISO/IEC29500-1:2016] ISO/IEC, "Information technology -- Document description and processing languages -- Office Open XML File Formats -- Part 1: Fundamentals and Markup Language Reference", ISO/IEC 29500-1:2016, https://www.iso.org/standard/71691.html

[ISO/IEC29500-3:2015] ISO/IEC, "Information technology -- Document description and processing languages -- Office Open XML File Formats -- Part 3: Markup Compatibility and Extensibility", https://www.iso.org/standard/65533.html

[ISO/IEC29500-4:2016] ISO/IEC, "Information technology -- Document description and processing languages -- Office Open XML File Formats -- Part 4: Transitional Migration Features", https://www.iso.org/standard/71692.html

[MS-DTYP] Microsoft Corporation, "Windows Data Types".

[MS-ODRAWXML] Microsoft Corporation, "Office Drawing Extensions to Office Open XML Structure".

[MS-OFFCRYPTO] Microsoft Corporation, "Office Document Cryptography Structure".

[MS-OSHARED] Microsoft Corporation, "Office Common Data Types and Objects Structures".

[MS-OWEXML] Microsoft Corporation, "Office Web Extensibility Extensions to Office Open XML Structure Specification".

[MS-XLDM] Microsoft Corporation, "Spreadsheet Data Model File Format".

[MS-XLSB] Microsoft Corporation, "Excel (.xlsb) Binary File Format".

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

[RFC3066] Alvestrand, H., "Tags for the Identification of Languages", BCP 47, RFC 3066, January 2001, http://www.ietf.org/rfc/rfc3066.txt

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

[RFC5646] Phillips, A, and Davis, M., "Tags for Identifying Languages", BCP 47, RFC 4646, September 2006, http://www.rfc-editor.org/rfc/bcp/bcp47.txt

[UNICODE5.1] The Unicode Consortium, "The Unicode Standard, Version 5.1.0, defined by: The Unicode Standard, Version 5.0 (Boston, MA, Addison-Wesley, 2007. ISBN 0-321-48091-0), as amended by Unicode 5.1.0", http://www.unicode.org/versions/Unicode5.1.0/

[W3C-XML] Bray, T., Paoli, J., Sperberg-McQueen, C.M., Maler, E., Yergeau, F., Eds., "Extensible Markup Language (XML) 1.1 (Second Edition)", W3C Recommendation, August 2006, http://www.w3.org/TR/2006/REC-xml11-20060816/

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

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

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

1.2.2 Informative References

[ISO/IEC29500-2:2012] ISO/IEC, "Information technology -- Document description and processing languages -- Office Open XML File Formats -- Part 2: Open Packaging Conventions", ISO/IEC 29500-2:2012, http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?csnumber=61796

[MS-AZOD] Microsoft Corporation, "Authorization Protocols Overview".

1.3 Structure Overview (Synopsis)

This document specifies spreadsheet-related extensions to Office Open XML file formats as described in [ISO/IEC29500-1:2016]. **Workbook** data is contained in a ZIP package conforming to the Open Packaging Conventions as described in [ISO/IEC29500-2:2012]. Individual files stored in the ZIP package, called parts [ISO/IEC29500-1:2016], contain information about the content and structure of a workbook, including workbook data, such as **worksheet** definitions. Some parts [ISO/IEC29500-1:2016]) store information by using **XML** and other parts [ISO/IEC29500-1:2016] store information by using binary data. The extensions specified in this document use the conventions specified by [ISO/IEC29500-3:2015], and they are both structures within parts specified by [ISO/IEC29500-1:2016] and extension parts within the package described by [ISO/IEC29500-2:2012].

1.4 Relationship to Protocols and Other Structures

This file format is a specified set of extensions to Office Open XML SpreadsheetML, specified in [ISO/IEC29500-1:2016]. This specification is dependent on the structures and concepts defined in the following references:

- [ISO/IEC29500-1:2016] for baseline SpreadsheetML persistence format.

- [ISO/IEC29500-2:2012] for open packaging conventions.

- [ISO/IEC29500-3:2015] for markup compatibility and extensibility.

- [ISO/IEC29500-4:2016] for backward compatibility considerations.

- [MS-OFFCRYPTO] for the persistence format for document signing, information rights management, document encryption, and obfuscation.

- [MS-ODRAWXML] for the persistence format for **shapes**.

1.5 Applicability Statement

This document specifies a persistence format for extensions to Office Open XML file formats as described in [ISO/IEC29500-1:2016] SpreadsheetML documents. The extensions specified in this document allow for expressing additional content and properties, and are not applicable as a stand-alone file format. Each structure specified in this document is integrated with SpreadsheetML documents as described in [ISO/IEC29500-1:2016] in a particular way, as specified in the section for that structure. All structures are integrated into SpreadsheetML documents in such a way that maintains compatibility with implementations of the Office Open XML file formats as described in [ISO/IEC29500-1:2016].

The extensions specified in this document do not require any other extensions to be used, and do not prohibit any other extensions from being used in the same document.

This persistence format provides interoperability with applications that create or read documents conforming to this structure.

1.6   Versioning and Localization

This document covers versioning issues in the following areas:

- **Structure Versions:** There is only one version of Excel Extensions to the Office Open XML SpreadsheetML File Format.

- **Localization:** The CT_ProtectedRange structure contains **fields** that specify locale-dependent meaning.

The Security Considerations section also specifies processes and data that are locale-dependent. See each structure and section description for more information.

1.7   Vendor-Extensible Fields

Specified in this document are extensions, using conventions described in [ISO/IEC29500-3:2015], both as structures within parts described in [ISO/IEC29500-1:2016] and as extension parts within the package described in [ISO/IEC29500-2:2012]. Implementations are not required to preserve or remove additional parts when modifying an existing document. See [ISO/IEC29500-3:2015] for more information.

2   Structures

In the following sections, the schema definition might be less restrictive than the processing rules imposed by the application. The XSD in this specification provides a base description of the file format. The text that introduces the XSD 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 application as specified restricts the same elements to being non-empty, not null, and present.

2.1   Part Enumerations

This section specifies parts in this file format that extend Office Open XML file formats as specified in [ISO/IEC29500-1:2016].

2.1.1   Control Properties

Content type: application /vnd.ms-excel.controlproperties+xml

Source relationship: http://schemas.openxmlformats.org/officeDocument/2006/relationships/ctrlProp

An instance of this part type specifies the properties of a form **control** embedded object in the package. A package can contain one or more control properties parts, and each part MUST be the target of an explicit relationship from a SpreadsheetML control, as specified in [ISO/IEC29500-1:2016] section 18.3.1.19.

If this relationship is present, the control MUST NOT have a relationship with an embedded control persistence part, as specified in [ISO/IEC29500-1:2016] section 15.2.9.

The syntax of the structures contained in this part uses **XML schema definition (XSD)**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **formControlPr** element, as specified in section 2.4.34.

2.1.2   Custom Data

Content type: application /binary

Source relationship:
http://schemas.openxmlformats.org/officeDocument/2006/relationships/customData

An instance of this part type specifies user-defined binary data.

A package MUST contain at most one custom data part per custom data properties part, as specified in section 2.1.3, and that part MUST be the target of an implicit relationship from a custom data properties part.

A custom data part MUST NOT have any implicit or explicit relationships to any other part specified by this protocol.

The content of this part consists of user-defined binary data that is stored on behalf of **add-ins**. The content is not specified in this protocol.

2.1.3 Custom Data Properties

Content type: application /vnd.openxmlformats-officedocument.customDataProperties+xml

Source relationship:
http://schemas.openxmlformats.org/officeDocument/2006/relationships/customDataProps

An instance of this part type specifies a single custom data properties part. This part specifies properties for the associated custom data part, as specified in section 2.1.2, specifically a **unique identifier (UID)** for the data storage.

A custom data properties part MUST be the target of an implicit relationship from the workbook part, as specified in [ISO/IEC29500-1:2016] section 12.3.23.

A custom data properties part is permitted to contain implicit relationships to the custom data part specified in section 2.1.2.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **datastoreItem** element, as specified in section 2.4.35.

2.1.4 Slicer Cache

Content type: application /vnd.ms-excel.slicerCache+xml

Source relationship: http://schemas.microsoft.com/office/2007/relationships/slicerCache

An instance of this part type specifies a single slicer cache part, as specified in section 3.1.1, in the **workbook**.

A package MUST contain one slicer cache part per **CT_SlicerCache** element, as specified in section 2.6.14, in the workbook part, a specified in [ISO/IEC29500-1:2016] section 12.3.23, and that part MUST be the target of an explicit relationship from the workbook part.

A slicer cache part MUST NOT have implicit or explicit relationships to any part specified by this protocol.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2] .

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **slicerCacheDefinition** element, as specified in section 2.4.38.

2.1.5 Slicers

Content type: application/vnd.ms-excel.slicer+xml

Source relationship: http://schemas.microsoft.com/office/2007/relationships/slicer

An instance of this part type specifies the slicer views, as specified in section 2.3.2.2, for a single **worksheet**.

The presence of a slicers part indicates that there is at least one slicer view on the associated worksheet, and that this part MUST be the target of an explicit relationship from the worksheet part, as specified in [ISO/IEC29500-1:2016] section 12.3.24.

A slicers part MUST NOT have implicit or explicit relationships to any part specified by this protocol.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **slicers** element, as specified in section 2.4.36.

2.1.6 Data Model

Content type: application/vnd.openxmlformats-officedocument.model+data

The presence of a model part indicates that there is a **spreadsheet data model** present in the workbook.

The content of this part is specified in [MS-XLDM]. In addition, this specification is extended by the **Annotations** property on different objects. Unless otherwise specified, all extensions in an **Annotations** object are written as **XML**.

2.1.6.1 Command Annotations

The **Annotations** property of a command object describing a **measure** ([MS-XLDM] section 2.6.9) can be extended with the following optional properties:

Type: MUST be either "Implicit" or "Explicit". "Implicit" specifies that the measure was created in the **field** list. "Explicit" specifies that the measure was created by the user specifying the definition of the measure.

Name: Specifies the name of the measure. MUST exist if **Type** is equal to "Implicit".

Table: Specifies the name of the source table for this measure. MUST exist if **Type** is equal to "Implicit".

Column: Specifies the name of the source field for this measure. MUST exist if **Type** is equal to "Implicit".

Aggregation: Specifies the aggregation type of an implicit measure. If this attribute is present, **Type** MUST be equal to "Implicit". This value MUST have the following form:

    AGGREGATION(TABLENAME.COLUMNNAME)

Where TABLENAME MUST be equal to **Table**, COLUMNNAME MUST be equal to **Column**, and the aggregation MUST be equal to one of the following:

Value	Meaning
SUM	The measure is the sum of the values in the source field specified by **Column**.

Value	Meaning
MAX	This measure is the maximum value in the source field specified by **Column**.
COUNTA	This measure is the count of values in the source field specified by **Column**.
AVERAGE	This measure is the average of the values in the source field specified by **Column**.
STDEV.S	This measure is the standard deviation of the values in the source field specified by **Column**.
STDEV.P	This measure is the standard deviation of the values in the source field specified by **Column**.
VAR.S	This measure is the variance in the values of the source field specified by **Column**.
DISTINCTCOUNT	This measure is the count of unique values in the source field specified by **Column**.

Application: Specifies the name of the application that created this measure. MUST exist if **Type** is equal to "Implicit"

2.1.6.2 DimensionAttribute Annotations

The **Annotations** property of a **DimensionAttribute** object describing a **column** in a **DimensionTabularModel** ([MS-XLDM] section 2.6.6) can be extended with the following optional properties:

ShortColumnId: Specifies the identifier used to represent this column in the command text when data is pushed to the model.

2.1.7 Timeline Cache

Content type: application /vnd.ms-excel.TimelineCache+xml

Source relationship: http://schemas.microsoft.com/office/2010/relationships/TimelineCache

An instance of this part type specifies a single **Timeline Cache** (section 2.3.5.1) in the **workbook**.

A package MUST contain one Timeline cache part per **CT_TimelineCacheRef** element, as specified in section 2.6.99, in the workbook part, as specified in [ISO/IEC29500-1:2016] section 12.3.23, and that part MUST be the target of an explicit relationship from the workbook part.

A **Timeline cache** part MUST NOT have implicit or explicit relationships to any part specified by this protocol.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **timelineCacheDefinition** element, as specified in section 2.4.58.

2.1.8 Timelines

Content type: application/vnd.ms-excel.Timeline+xml

Source relationship: http://schemas.microsoft.com/office/2010/relationships/Timeline

An instance of this part type specifies the Timeline views for a single **worksheet**.

The presence of a Timelines part indicates that there is at least one Timeline view on the associated worksheet, and that this part MUST be the target of an explicit relationship from the worksheet part, as specified in [ISO/IEC29500-1:2016] section 12.3.24.

A Timelines part MUST NOT have implicit or explicit relationships to any part specified by this protocol.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **timelines** element, as specified in section 2.4.57.

2.1.9 Survey

Content type: application/vnd.ms-excel.Survey+xml

Source relationship: http://schemas.microsoft.com/office/2010/relationships/Survey

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **survey** element, as specified in section 2.4.69.

2.1.10 Rich Value Data

Content type: application/vnd.ms-excel.rdRichValue+xml

Source relationship: http://schemas.microsoft.com/office/2017/06/relationships/rdRichValue

The presence of this part type indicates that there are **rich values** in the **workbook** and a **Rich Value Structure** (section 2.1.11) part MUST be part of the package.

A **Rich Value Data** part MUST be the target of an implicit relationship from the **Metadata** part, as specified in [ISO/IEC29500-1:2016] section 18.9.2.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **rvData** element, as specified in section 2.4.77.

2.1.11 Rich Value Structure

Content type: application/vnd.ms-excel.rdRichValueStructure+xml

Source relationship: http://schemas.microsoft.com/office/2017/06/relationships/rdRichValueStructure

The presence of this part type indicates that there are **rich values** in the **workbook** and a **Rich Value Data** (section 2.1.10) part MUST be part of the package.

A **Rich Value Structure** part MUST be the target of an implicit relationship from the **Rich Value Data** part, as specified in section 2.6.175.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **rvStructures** element, as specified in section 2.4.78.

2.1.12 Rich Value Array

Content type: application/vnd.ms-excel.rdArray+xml

Source relationship: http://schemas.microsoft.com/office/2017/06/relationships/rdArray

The presence of this part type indicates that there are **rich values** in the **workbook** and a **Rich Value Data** (section 2.1.10) part and a **Rich Value Structure** (section 2.1.11) part MUST be part of the package.

A **Rich Value Array** part MUST be the target of an implicit relationship from the **Rich Value Data** part, as specified in section 2.6.175.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **arrayData** element, as specified in section 2.4.74.

2.1.13 Rich Styles

Content type: application/vnd.ms-excel.richStyles+xml

Source relationship: http://schemas.microsoft.com/office/2017/06/relationships/richStyles

The presence of this part type indicates that there are **rich values** with **styles** in the **workbook** and a **Rich Value Data** (section 2.1.10) part, a **Rich Value Structure** (section 2.1.11) part, a **Supporting Property Bag Data** (section 2.1.14) part, and a **Supporting Property Bag Structure** (section 2.1.15) part MUST be part of the package.

A **Rich Styles** part MUST be the target of an implicit relationship from the **Supporting Property Bag Data** part (section 2.6.192), as specified in Special Keys and Key Flags in section 2.3.6.3.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **richStyleSheet** element, as specified in section 2.4.75.

2.1.14 Supporting Property Bag Data

Content type: application/vnd.ms-excel.rdSupportingPropertyBag+xml

Source relationship:
http://schemas.microsoft.com/office/2017/06/relationships/rdSupportingPropertyBag

The presence of this part type indicates that there are **rich values** with **supporting property bags** in the **workbook** and a **Rich Value Data** (section 2.1.10) part, a **Rich Value Structure** (section 2.1.11) part, and a **Supporting Property Bag Structure** (section 2.1.15) part MUST be part of the package.

A **Supporting Property Bag** part MUST be the target of an implicit relationship from the **Rich Value Data** part, as specified in section 2.6.175.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **supportingPropertyBags** element, as specified in section 2.4.81.

2.1.15 Supporting Property Bag Structure

Content type: application/vnd.ms-excel.rdSupportingPropertyBagStructure+xml

Source relationship:
http://schemas.microsoft.com/office/2017/06/relationships/rdSupportingPropertyBagStructure

The presence of this part type indicates that there are **rich values** with **supporting property bags** in the **workbook** and a **Rich Value Data** (section 2.1.10) part, a **Rich Value Structure** (section 2.1.11) part, and a **Supporting Property Bag Data** (section 2.1.14) part MUST be part of the package.

A **Supporting Property Bag Structure** part MUST be the target of an implicit relationship from the **Supporting Property Bag** part, as specified in section 2.6.188.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **spbStructures** element, as specified in section 2.4.80.

2.1.16 Rich Value Types

Content type: application/vnd.ms-excel.rdRichValuetypes+xml

Source relationship: http://schemas.microsoft.com/office/2017/06/relationships/rdRichValueTypes

The presence of this part type indicates that there is information about **rich value types** in the **workbook** and a **Rich Value Data** (section 2.1.10) part, and a **Rich Value Structure** (section 2.1.11) part MAY be part of the package.

A **Rich Value Types** part MAY be the target of an implicit relationship from the **RichValue Structure** part, as specified in section 2.3.6.3.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **rvTypesInfo** element, as specified in section 2.4.79.

2.1.17 Threaded Comments

Content type: application/vnd.ms-excel.threadedcomments+xml

Source relationship: http://schemas.microsoft.com/office/2017/10/relationships/threadedComment

An instance of this part type specifies the **Threaded Comments** (section 2.3.7) for a single **worksheet**.

The presence of a Threaded Comments part indicates that there is at least one Threaded Comment on the associated worksheet, and that this part MUST be the target of an implicit relationship from the worksheet part, as specified in [ISO/IEC29500-1:2016] section 12.3.24.

A Threaded Comments part MUST NOT have implicit or explicit relationships to any part specified by this protocol.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **ThreadedComments** element, as specified in section 2.4.86

2.1.18 Persons

Content type: application/vnd.ms-excel.person+xml

Source relationship: http://schemas.microsoft.com/office/2017/10/relationships/person

The presence of this part type indicates that there is information about **Persons** (section 2.3.7.1) in the **workbook**.

A **Persons** part MUST be the target of an implicit relationship from the workbook part, as specified in [ISO/IEC29500-1:2016] section 12.3.23.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **personList** element, as specified in section 2.4.85

2.1.19 Named Sheet Views

Content type: application/vnd.ms-excel.namedsheetviews+xml

Source relationship: http://schemas.microsoft.com/office/2019/04/relationships/namedSheetView

An instance of this part type specifies the **Named Sheet Views** (section 2.3.8) for a single **worksheet**.

The presence of a Named Sheet Views part indicates that there is at least one Named Sheet View on the associated worksheet, and that this part MUST be the target of an implicit relationship from the worksheet part, as specified in [ISO/IEC29500-1:2016] section 12.3.24.

A Named Sheet Views part MUST NOT have implicit or explicit relationships to any part specified by this protocol.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **namedSheetViews** element, as specified in section 2.4.88

2.1.20 Web Image Supporting Rich Data

Content type: application/vnd.ms-excel.rdrichvaluewebimage+xml

Source relationship: http://schemas.microsoft.com/office/2020/07/relationships/rdrichvaluewebimage

The presence of this part type indicates that there is supporting information for web image **rich values** in the **workbook** and a **Rich Value Data** (section 2.1.10) part, and a **Rich Value Structure** (section 2.1.11) part MUST be part of the package.

A **Web Image Supporting Rich Data** part MUST be the target of an implicit relationship from the **Rich Value Data** part, as specified in section 2.3.6.1.10.

The syntax of the structures contained in this part uses **XSD**, as specified in [XMLSCHEMA1/2] and [XMLSCHEMA2/2].

This specification defines and references various **XML namespaces** by using the mechanisms specified in [XMLNS].

The content of this part is **XML**, and the **root element** for the part is the **webImagesSrd** element, as specified in section 2.4.90.

2.2 Extensions

Extensions are specified by using the conventions provided by Office Open XML file formats as specified in [ISO/IEC29500-3:2015].The following namespaces are utilized by the extensions specified in this document:

- "http://schemas.microsoft.com/office/drawingml/2010/slicer"<1>

- "http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"<2>

- "http://schemas.microsoft.com/office/spreadsheetml/2009/9/ac"<3>

- "http://schemas.microsoft.com/office/excel/2006/main"

- "http://schemas.microsoft.com/office/spreadsheetml/2010/11/main"<4>

- "http://schemas.microsoft.com/office/drawing/2012/timeslicer"<5>

2.2.1 SpreadsheetML Extensibility Elements

When the global elements **f**, **ref**, or **sqref** are contained within an **ext** ([ISO/IEC29500-1:2016] section 18.2.7) element and contain **cell references**, an application can adjust these cell references when the **worksheet** layout changes, even when the containing **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) is not recognized by the application. See [ISO/IEC29500-3:2015] section 10.1.2 for more details about how extension lists are used.

2.2.2 Formulas

The following ABNF grammar is used by formulas in other parts of this document.

```
formula = expression

expression= ref-expression / *whitespace nospace-expression *whitespace
ref-expression= *whitespace ref-nospace-expression *whitespace
nospace-expression = "("  expression  ")" / constant / prefix-operator expression /
expression infix-operator expression / expression postfix-operator / function-call
ref-nospace-expression = "("  ref-expression  ")" / ref-constant / ref-expression ref-infix-
operator ref-expression / cell-reference / ref-function-call / name-reference / structure-
reference
constant = error-constant / logical-constant / numerical-constant / string-constant / array-
constant
ref-constant = "#REF!"
error-constant = ref-constant / "#DIV/0!"  /  "#N/A"  /  "#NAME?"  /  "#NULL!" / "#NUM!"  /
"#VALUE!" / "#GETTING_DATA"
logical-constant = "FALSE"  /  "TRUE"
numerical-constant = [neg-sign] significand-part [exponent-part]
significand-part = whole-number-part [fractional-part] / fractional-part
whole-number-part = digit-sequence
fractional-part = full-stop digit-sequence
exponent-part = exponent-character [ sign ] digit-sequence
full-stop = "."
sign = "+"  / neg-sign
neg-sign = "-"
exponent-character = "E"
digit-sequence = 1*decimal-digit
decimal-digit=  %x30-39
nonzero-decimal-digit = %x31-39
string-constant = double-quote [string-chars] double-quote
string-chars = string-char *string-char
```

```
string-char = escaped-double-quote / character ; MUST NOT be a double-quote
escaped-double-quote = 2double-quote
double-quote = %x22
;character = as defined by the production Char in the [W3C-XML] section 2.2
array-constant = "{" constant-list-rows "}"
constant-list-rows =  constant-list-row *(semicolon  constant-list-row)
semicolon =  ";"
constant-list-row = constant *(comma constant)
;An array-constant MUST NOT contain an array-constant or columns of unequal length or rows of
unequal length.
operator = ":" / comma / space / "^" / "*" / "/" / "+" / "-" / "&" / "=" / "<>" / "<" / "<="
/ ">" / ">=" / "%"
infix-operator = ref-infix-operator / value-infix-operator
value-infix-operator = "^" / "*" / "/" / "+" / "-" / "&"/ "=" / "<>" / "<" / "<=" / ">" /
">="
ref-infix-operator = range-operator / union-operator / intersection-operator
union-operator = comma
intersection-operator = space
range-operator = ":"
postfix-operator =  "%"
prefix-operator =  "+"  /  "-"
cell-reference = external-cell-reference / local-cell-reference
local-cell-reference = A1-reference
external-cell-reference = bang-reference / sheet-range-reference / single-sheet-reference
book-prefix = workbook-index "!"
bang-reference = "!" (A1-reference / "#REF!")
sheet-range-reference = sheet-range "!" A1-reference
single-sheet-prefix = single-sheet "!"
single-sheet-reference = single-sheet-prefix (A1-reference / "#REF!")
single-sheet-area = single-sheet-prefix A1-area
single-sheet = [workbook-index] sheet-name / apostrophe [workbook-index] sheet-name-special
apostrophe
sheet-range = [workbook-index] sheet-name ":" sheet-name / apostrophe [workbook-index] sheet-
name-special ":" sheet-name-special apostrophe
workbook-index = "[" whole-number-part "]"
sheet-name = sheet-name-characters
sheet-name-characters = 1*sheet-name-character
sheet-name-character = character ; MUST NOT be an operator, ', [, ], \, or ?
apostrophe= "'"
space = " "
whitespace = space / %x0D %x0A
sheet-name-special = sheet-name-base-character  [*sheet-name-character-special sheet-name-
base-character]
sheet-name-character-special = 2apostrophe / sheet-name-base-character
sheet-name-base-character = character ; MUST NOT be ', *, [, ], \, :, /, ?, or Unicode
character 'END OF TEXT'
parameter-name = "xlpm." Name
lambda-parameter-name = parameter-name / "xlop." Name
A1-reference = (A1-column ":" A1-column) / (A1-row ":" A1-row) / A1-cell / A1-area
A1-cell = A1-column A1-row
A1-area = A1-cell ":" A1-cell
A1-column = A1-relative-column / A1-absolute-column
A1-relative-column = 1*2letter / A-to-W 2letter / "X" A-to-E letter / "XF" A-to-D
A-to-D = %x41-44 / %x61-64
A-to-E = A-to-D / "E"
A-to-W = %x41-57 / %x61-77
letter = %x41-5A / %x61-7A
A1-absolute-column = "$" A1-relative-column
A1-row = A1-relative-row / A1-absolute-row
A1-relative-row = row-digit-sequence
row-digit-sequence = nonzero-decimal-digit *5decimal-digit /  "10" %x30-33 4decimal-digit /
"104" %x30-37 3decimal-digit / "1048" %x30-34 2decimal-digit / "10485" %x30-36 decimal-digit
/ "104857" %x30-36
A1-absolute-row = "$" A1-relative-row
cell-function-call = A1-cell "(" argument-list ")"
user-defined-function-call = user-defined-function-name "(" argument-list ")"
user-defined-function-name = name-reference
argument-list = argument *253(comma argument)
comma= ","
```

```
argument = *whitespace [argument-expression]
argument-expression= ref-argument-expression / *whitespace nospace-argument-expression
*whitespace
ref-argument-expression= *whitespace ref-argument-nospace-expression *whitespace
nospace-argument-expression = "("  expression  ")" / constant / prefix-operator argument-
expression / argument-expression argument-infix-operator argument-expression / argument-
expression postfix-operator / function-call
ref-argument-nospace-expression = "("  ref-expression  ")" / ref-constant / ref-argument-
expression ref-argument-infix-operator ref-argument-expression / cell-reference / ref-
function-call / name-reference / structure-reference
argument-infix-operator = ref-argument-infix-operator / value-infix-operator

ref-argument-infix-operator = range-operator / intersection-operator
unicode-digit = (any code points which are digits as defined by the Unicode character
properties, [UNICODE5.1] chapter 4)
R1C1-cell-reference = R1C1-row / R1C1-column / R1C1-row R1C1-column / R1C1-column R1C1-row
R1C1-row = "R" row-number

R1C1-column = "C" column-number
column-number = 1-16384
; A string composed of unicode-digits that represents an unsigned integer that is greater
than or equal to 1 and less than or equal to 16384

row-number = 1-1048576
; A string composed of unicode-digits that represents an unsigned integer that is greater
than or equal to 1 and less than or equal to 1048576.

name-reference = name / external-name
external-name = bang-name / (single-sheet-prefix / book-prefix ) name
bang-name = "!" name
name = name-start-character [ name-characters ]
name-start-character = underscore  /  backslash  /  letter / name-base-character
underscore = "_"
backslash = "\"
name-base-character = (any code points which are characters as defined by the Unicode
character properties, [UNICODE5.1] chapter 4 ; MUST NOT be 0x0-0x7F)
name-characters= 1*name-character
name-character = name-start-character / decimal-digit / full-stop  / questionmark
questionmark = "?"
;A name MUST NOT have any of the following forms:
;TRUE or FALSE
;cell-reference
;function-list
;command-list
;future-function-list
;R1C1-cell-reference

structure-reference = [table-identifier] intra-table-reference
table-identifier = [book-prefix] table-name
table-name = name
;table-name is the name of the table the structure reference refers to. If it is missing, the
formula containing the structure reference MUST be entered into a cell which belongs to a
table and that table's name is used as the table-name. table-name MUST be the value of the
displayName attribute of some table element ([ISO/IEC29500-1:2016] section 18.5.1.2). It MUST
NOT be any other user-defined name.
intra-table-reference = spaced-lbracket inner-reference spaced-rbracket / keyword / ("["
[simple-column-name] "]")
inner-reference = keyword-list / ([keyword-list spaced-comma] column-range)
keyword = "[#All]" / "[#Data]" / "[#Headers]" / "[#Totals]" / "[#This Row]"
keyword-list = keyword / ("[#Headers]" spaced-comma "[#Data]") / ("[#Data]" spaced-comma
"[#Totals]")
column-range = column [":" column]
column = simple-column-name / ("[" *space simple-column-name *space "]")
simple-column-name = [any-nospace-column-character *any-column-character] any-nospace-column-
character
escape-column-character = tick / "[" / "]" / "#"
tick = %x27
unescaped-column-character = character    ; MUST NOT match escape-column-character or space
any-column-character = any-nospace-column-character / space
```

```
any-nospace-column-character = unescaped-column-character / (tick escape-column-character)
spaced-comma = [space] comma [space]
spaced-lbracket = "[" [space]
spaced-rbracket = [space] "]"
function-list = "ABS" / "ABSREF" / "ACCRINT" / "ACCRINTM" / "ACOS" / "ACOSH" / "ACTIVE.CELL"
/ "ADD.BAR" / "ADD.COMMAND" / "ADD.MENU" / "ADD.TOOLBAR" / "ADDRESS" / "AMORDEGRC" /
"AMORLINC" / "AND" / "APP.TITLE" / "AREAS" / "ARGUMENT" / "ASC" / "ASIN" / "ASINH" / "ATAN" /
"ATAN2" / "ATANH" / "AVEDEV" / "AVERAGE" / "AVERAGEA" / "AVERAGEIF" / "AVERAGEIFS" /
"BAHTTEXT" / "BESSELI" / "BESSELJ" / "BESSELK" / "BESSELY" / "BETADIST" / "BETAINV" /
"BIN2DEC" / "BIN2HEX" / "BIN2OCT" / "BINOMDIST" / "BREAK" / "CALL" / "CALLER" / "CANCEL.KEY"
/ "CEILING" / "CELL" / "CHAR" / "CHECK.COMMAND" / "CHIDIST" / "CHIINV" / "CHITEST" / "CHOOSE"
/ "CLEAN" / "CODE" / "COLUMN" / "COLUMNS" / "COMBIN" / "COMPLEX" / "CONCAT" / "CONCATENATE" /
"CONFIDENCE" / "CONVERT" / "CORREL" / "COS" / "COSH" / "COUNT" / "COUNTA" / "COUNTBLANK" /
"COUNTIF" / "COUNTIFS" / "COUPDAYBS" / "COUPDAYS" / "COUPDAYSNC" / "COUPNCD" / "COUPNUM" /
"COUPPCD" / "COVAR" / "CREATE.OBJECT" / "CRITBINOM" / "CUBEKPIMEMBER" / "CUBEMEMBER" /
"CUBEMEMBERPROPERTY" / "CUBERANKEDMEMBER" / "CUBESET" / "CUBESETCOUNT" / "CUBEVALUE" /
"CUMIPMT" / "CUMPRINC" / "CUSTOM.REPEAT" / "CUSTOM.UNDO" / "DATE" / "DATEDIF" / "DATESTRING"
/ "DATEVALUE" / "DAVERAGE" / "DAY" / "DAYS360" / "DB" / "DBCS" / "DCOUNT" / "DCOUNTA" / "DDB"
/ "DEC2BIN" / "DEC2HEX" / "DEC2OCT" / "DEGREES" / "DELETE.BAR" / "DELETE.COMMAND" /
"DELETE.MENU" / "DELETE.TOOLBAR" / "DELTA" / "DEREF" / "DEVSQ" / "DGET" / "DIALOG.BOX" /
"DIRECTORY" / "DISC" / "DMAX" / "DMIN" / "DOCUMENTS" / "DOLLAR" / "DOLLARDE" / "DOLLARFR" /
"DPRODUCT" / "DSTDEV" / "DSTDEVP" / "DSUM" / "DURATION" / "DVAR" / "DVARP" / "ECHO" / "EDATE"
/ "EFFECT" / "ELSE" / "ELSE.IF" / "ENABLE.COMMAND" / "ENABLE.TOOL" / "END.IF" / "EOMONTH" /
"ERF" / "ERFC" / "ERROR" / "ERROR.TYPE" / "EVALUATE" / "EVEN" / "EXACT" / "EXEC" / "EXECUTE"
/ "EXP" / "EXPONDIST" / "FACT" / "FACTDOUBLE" / "FALSE" / "FCLOSE" / "FDIST" / "FILES" /
"FIND" / "FINDB" / "FINV" / "FISHER" / "FISHERINV" / "FIXED" / "FLOOR" / "FOPEN" / "FOR" /
"FOR.CELL" / "FORECAST" / "FORMULA.CONVERT" / "FPOS" / "FREAD" / "FREADLN" / "FREQUENCY" /
"FSIZE" / "FTEST" / "FV" / "FVSCHEDULE" / "FWRITE" / "FWRITELN" / "GAMMADIST" / "GAMMAINV" /
"GAMMALN" / "GCD" / "GEOMEAN" / "GESTEP" / "GET.BAR" / "GET.CELL" / "GET.CHART.ITEM" /
"GET.DEF" / "GET.DOCUMENT" / "GET.FIELD" / "GET.FORMULA" / "GET.ITEM" / "GET.LINK.INFO" /
"GET.MOVIE" / "GET.NAME" / "GET.NOTE" / "GET.OBJECT" / "GET.TOOL" / "GET.TOOLBAR" /
"GET.VIEW" / "GET.WINDOW" / "GET.WORKBOOK" / "GET.WORKSPACE" / "GETPIVOTDATA" / "GOTO" /
"GROUP" / "GROWTH" / "HALT" / "HARMEAN" / "HELP" / "HEX2BIN" / "HEX2DEC" / "HEX2OCT" /
"HLOOKUP" / "HOUR" / "HYPERLINK" / "HYPGEOMDIST" / "IF" / "IFS" / "IFERROR" / "IMABS" /
"IMAGINARY" / "IMARGUMENT" / "IMCONJUGATE" / "IMCOS" / "IMDIV" / "IMEXP" / "IMLN" / "IMLOG10"
/ "IMLOG2" / "IMPOWER" / "IMPRODUCT" / "IMREAL" / "IMSIN" / "IMSQRT" / "IMSUB" / "IMSUM" /
"INDEX" / "INDIRECT" / "INFO" / "INITIATE" / "INPUT" / "INT" / "INTERCEPT" / "INTRATE" /
"IPMT" / "IRR" / "ISBLANK" / "ISERR" / "ISERROR" / "ISEVEN" / "ISLOGICAL" / "ISNA" /
"ISNONTEXT" / "ISNUMBER" / "ISODD" / "ISPMT" / "ISREF" / "ISTEXT" / "ISTHAIDIGIT" / "KURT" /
"LARGE" / "LAST.ERROR" / "LCM" / "LEFT" / "LEFTB" / "LEN" / "LENB" / "LINEST" / "LINKS" /
"LN" / "LOG" / "LOG10" / "LOGEST" / "LOGINV" / "LOGNORMDIST" / "LOOKUP" / "LOWER" / "MATCH" /
"MAX" / "MAXA" / "MAXIFS" / "MDETERM" / "MDURATION" / "MEDIAN" / "MID" / "MIDB" / "MIN" /
"MINA" / "MINIFS" / "MINUTE" / "MINVERSE" / "MIRR" / "MMULT" / "MOD" / "MODE" / "MONTH" /
"MOVIE.COMMAND" / "MROUND" / "MULTINOMIAL" / "N" / "NA" / "NAMES" / "NEGBINOMDIST" /
"NETWORKDAYS" / "NEXT" / "NOMINAL" / "NORMDIST" / "NORMINV" / "NORMSDIST" / "NORMSINV" /
"NOT" / "NOTE" / "NOW" / "NPER" / "NPV" / "NUMBERSTRING" / "OCT2BIN" / "OCT2DEC" / "OCT2HEX"
/ "ODD" / "ODDFPRICE" / "ODDFYIELD" / "ODDLPRICE" / "ODDLYIELD" / "OFFSET" / "OPEN.DIALOG" /
"OPTIONS.LISTS.GET" / "OR" / "PAUSE" / "PEARSON" / "PERCENTILE" / "PERCENTRANK" / "PERMUT" /
"PHONETIC" / "PI" / "PMT" / "POISSON" / "POKE" / "POWER" / "PPMT" / "PRESS.TOOL" / "PRICE" /
"PRICEDISC" / "PRICEMAT" / "PROB" / "PRODUCT" / "PROPER" / "PV" / "QUARTILE" / "QUOTIENT" /
"RADIANS" / "RAND" / "RANDBETWEEN" / "RANK" / "RATE" / "RECEIVED" / "REFTEXT" / "REGISTER" /
"REGISTER.ID" / "RELREF" / "RENAME.COMMAND" / "REPLACE" / "REPLACEB" / "REPT" / "REQUEST" /
"RESET.TOOLBAR" / "RESTART" / "RESULT" / "RESUME" / "RETURN" / "RIGHT" / "RIGHTB" / "ROMAN" /
"ROUND" / "ROUNDBAHTDOWN" / "ROUNDBAHTUP" / "ROUNDDOWN" / "ROUNDUP" / "ROW" / "ROWS" / "RSQ"
/ "RTD" / "SAVE.DIALOG" / "SAVE.TOOLBAR" / "SCENARIO.GET" / "SEARCH" / "SEARCHB" / "SECOND" /
"SELECTION" / "SERIES" / "SERIESSUM" / "SET.NAME" / "SET.VALUE" / "SHOW.BAR" / "SIGN" / "SIN"
/ "SINH" / "SKEW" / "SLN" / "SLOPE" / "SMALL" / "SPELLING.CHECK" / "SPREADBASE.DATA.FIELD" /
"SQRT" / "SQRTPI" / "STANDARDIZE" / "STDEV" / "STDEVA" / "STDEVP" / "STDEVPA" / "STEP" /
"STEYX" / "SUBSTITUTE" / "SUBTOTAL" / "SUM" / "SUMIF" / "SUMIFS" / "SUMPRODUCT" / "SUMSQ" /
"SUMX2MY2" / "SUMX2PY2" / "SUMXMY2" / "SWITCH" / "SYD" / "T" / "TAN" / "TANH" / "TBILLEQ" /
"TBILLPRICE" / "TBILLYIELD" / "TDIST" / "TERMINATE" / "TEXT" / "TEXT.BOX" / "TEXTJOIN" /
"TEXTREF" / "THAIDAYOFWEEK" / "THAIDIGIT" / "THAIMONTHOFYEAR" / "THAINUMSOUND" /
"THAINUMSTRING" / "THAISTRINGLENGTH" / "THAIYEAR" / "TIME" / "TIMEVALUE" / "TINV" / "TODAY" /
"TRANSPOSE" / "TREND" / "TRIM" / "TRIMMEAN" / "TRUE" / "TRUNC" / "TTEST" / "TYPE" /
"UNREGISTER" / "UPPER" / "USDOLLAR" / "VALUE" / "VAR" / "VARA" / "VARP" / "VARPA" / "VDB" /
"VIEW.GET" / "VLOOKUP" / "VOLATILE" / "WEEKDAY" / "WEEKNUM" / "WEIBULL" / "WHILE" /
"WINDOW.TITLE" / "WINDOWS" / "WORKDAY" / "XIRR" / "XNPV" / "YEAR" / "YEARFRAC" / "YIELD" /
"YIELDDISC" / "YIELDMAT" / "ZTEST"
```

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command-list = ("A1.R1C1" / "ACTIVATE" / "ACTIVATE.NEXT" / "ACTIVATE.NOTES" / "ACTIVATE.PREV"
/ "ACTIVE.CELL.FONT" / "ADD.ARROW" / "ADD.CHART.AUTOFORMAT" / "ADD.LIST.ITEM" / "ADD.OVERLAY"
/ "ADD.PRINT.AREA" / "ADD.TOOL" / "ADDIN.MANAGER" / "ALERT" / "ALIGNMENT" / "APP.ACTIVATE" /
"APP.ACTIVATE.MICROSOFT" / "APP.MAXIMIZE" / "APP.MINIMIZE" / "APP.MOVE" / "APP.RESTORE" /
"APP.SIZE" / "APPLY.NAMES" / "APPLY.STYLE" / "ARRANGE.ALL" / "ASSIGN.TO.OBJECT" /
"ASSIGN.TO.TOOL" / "ATTACH.TEXT" / "ATTACH.TOOLBARS" / "ATTRIBUTES" / "AUTO.OUTLINE" /
"AUTOCORRECT" / "AXES" / "BEEP" / "BORDER" / "BRING.TO.FRONT" / "CALCULATE.DOCUMENT" /
"CALCULATE.NOW" / "CALCULATION" / "CANCEL.COPY" / "CELL.PROTECTION" / "CHANGE.LINK" /
"CHART.ADD.DATA" / "CHART.TREND" / "CHART.WIZARD" / "CHECKBOX.PROPERTIES" / "CLEAR" /
"CLEAR.OUTLINE" / "CLEAR.PRINT.AREA" / "CLEAR.ROUTING.SLIP" / "CLOSE" / "CLOSE.ALL" /
"COLOR.PALETTE" / "COLUMN.WIDTH" / "COMBINATION" / "CONSOLIDATE" / "CONSTRAIN.NUMERIC" /
"COPY" / "COPY.CHART" / "COPY.PICTURE" / "COPY.TOOL" / "CREATE.NAMES" / "CREATE.PUBLISHER" /
"CUSTOMIZE.TOOLBAR" / "CUT" / "DATA.DELETE" / "DATA.FIND" / "DATA.FIND.NEXT" /
"DATA.FIND.PREV" / "DATA.FORM" / "DATA.LABEL" / "DATA.SERIES" / "DEFINE.NAME" /
"DEFINE.STYLE" / "DELETE.ARROW" / "DELETE.CHART.AUTOFORMAT" / "DELETE.FORMAT" / "DELETE.NAME"
/ "DELETE.NOTE" / "DELETE.OVERLAY" / "DELETE.STYLE" / "DELETE.TOOL" / "DEMOTE" /
"DISABLE.INPUT" / "DISPLAY" / "DUPLICATE" / "EDIT.COLOR" / "EDIT.DELETE" / "EDIT.OBJECT" /
"EDIT.REPEAT" / "EDIT.SERIES" / "EDIT.TOOL" / "EDITBOX.PROPERTIES" / "EDITION.OPTIONS" /
"ENABLE.OBJECT" / "ENABLE.TIPWIZARD" / "ENTER.DATA" / "ERRORBAR.X" / "ERRORBAR.Y" /
"EXTEND.POLYGON" / "EXTRACT" / "FILE.CLOSE" / "FILE.DELETE" / "FILL.AUTO" / "FILL.DOWN" /
"FILL.GROUP" / "FILL.LEFT" / "FILL.RIGHT" / "FILL.UP" / "FILTER" / "FILTER.ADVANCED" /
"FILTER.SHOW.ALL" / "FIND.FILE" / "FONT" / "FONT.PROPERTIES" / "FORMAT.AUTO" / "FORMAT.CHART"
/ "FORMAT.CHARTTYPE" / "FORMAT.FONT" / "FORMAT.LEGEND" / "FORMAT.MAIN" / "FORMAT.MOVE" /
"FORMAT.NUMBER" / "FORMAT.OVERLAY" / "FORMAT.SHAPE" / "FORMAT.SIZE" / "FORMAT.TEXT" /
"FORMULA" / "FORMULA.ARRAY" / "FORMULA.FILL" / "FORMULA.FIND" / "FORMULA.FIND.NEXT" /
"FORMULA.FIND.PREV" / "FORMULA.GOTO" / "FORMULA.REPLACE" / "FREEZE.PANES" / "FULL" /
"FULL.SCREEN" / "FUNCTION.WIZARD" / "GALLERY.3D.AREA" / "GALLERY.3D.BAR" /
"GALLERY.3D.COLUMN" / "GALLERY.3D.LINE" / "GALLERY.3D.PIE" / "GALLERY.3D.SURFACE" /
"GALLERY.AREA" / "GALLERY.BAR" / "GALLERY.COLUMN" / "GALLERY.CUSTOM" / "GALLERY.DOUGHNUT" /
"GALLERY.LINE" / "GALLERY.PIE" / "GALLERY.RADAR" / "GALLERY.SCATTER" / "GOAL.SEEK" /
"GRIDLINES" / "HIDE" / "HIDE.DIALOG" / "HIDE.OBJECT" / "HIDEALL.INKANNOTS" / "HIDEALL.NOTES"
/ "HIDECURR.NOTE" / "HLINE" / "HPAGE" / "HSCROLL" / "INSERT" / "INSERT.MAP.OBJECT" /
"INSERT.OBJECT" / "INSERT.PICTURE" / "INSERT.TITLE" / "INSERTDATATABLE" / "JUSTIFY" /
"LABEL.PROPERTIES" / "LAYOUT" / "LEGEND" / "LINE.PRINT" / "LINK.COMBO" / "LINK.FORMAT" /
"LIST.NAMES" / "LISTBOX.PROPERTIES" / "MACRO.OPTIONS" / "MAIL.ADD.MAILER" /
"MAIL.DELETE.MAILER" / "MAIL.EDIT.MAILER" / "MAIL.FORWARD" / "MAIL.LOGOFF" / "MAIL.LOGON" /
"MAIL.NEXT.LETTER" / "MAIL.REPLY" / "MAIL.REPLY.ALL" / "MAIL.SEND.MAILER" / "MAIN.CHART" /
"MAIN.CHART.TYPE" / "MENU.EDITOR" / "MERGE.STYLES" / "MESSAGE" / "MOVE.BRK" / "MOVE.TOOL" /
"MSOCHECKS" / "NEW" / "NEW.WINDOW" / "NEWWEBQUERY" / "NORMAL" / "OBJECT.PROPERTIES" /
"OBJECT.PROTECTION" / "ON.DATA" / "ON.DOUBLECLICK" / "ON.ENTRY" / "ON.KEY" / "ON.RECALC" /
"ON.SHEET" / "ON.TIME" / "ON.WINDOW" / "OPEN" / "OPEN.LINKS" / "OPEN.MAIL" / "OPEN.TEXT" /
"OPTIONS.CALCULATION" / "OPTIONS.CHART" / "OPTIONS.EDIT" / "OPTIONS.GENERAL" /
"OPTIONS.LISTS.ADD" / "OPTIONS.LISTS.DELETE" / "OPTIONS.ME" / "OPTIONS.MENONO" /
"OPTIONS.SAVE" / "OPTIONS.SPELL" / "OPTIONS.TRANSITION" / "OPTIONS.VIEW" / "OUTLINE" /
"OVERLAY" / "OVERLAY.CHART.TYPE" / "PAGE.SETUP" / "PARSE" / "PASTE" / "PASTE.LINK" /
"PASTE.PICTURE" / "PASTE.PICTURE.LINK" / "PASTE.SPECIAL" / "PASTE.TOOL" / "PATTERNS" /
"PICKLIST" / "PIVOT.ADD.FIELDS" / "PIVOT.FIELD" / "PIVOT.FIELD.GROUP" /
"PIVOT.FIELD.PROPERTIES" / "PIVOT.FIELD.UNGROUP" / "PIVOT.ITEM" / "PIVOT.ITEM.PROPERTIES" /
"PIVOT.REFRESH" / "PIVOT.SHOW.PAGES" / "PIVOT.TABLE.CHART" / "PIVOT.TABLE.WIZARD" /
"POST.DOCUMENT" / "PRECISION" / "PREFERRED" / "PRINT" / "PRINT.PREVIEW" / "PRINTER.SETUP" /
"PROMOTE" / "PROTECT.DOCUMENT" / "PROTECT.REVISIONS" / "PUSHBUTTON.PROPERTIES" / "QUIT" /
"REMOVE.LIST.ITEM" / "REMOVE.PAGE.BREAK" / "RENAME.OBJECT" / "REPLACE.FONT" / "RESET.TOOL" /
"RM.PRINT.AREA" / "ROUTE.DOCUMENT" / "ROUTING.SLIP" / "ROW.HEIGHT" / "RUN" / "SAVE" /
"SAVE.AS" / "SAVE.COPY.AS" / "SAVE.NEW.OBJECT" / "SAVE.WORKBOOK" / "SAVE.WORKSPACE" / "SCALE"
/ "SCENARIO.ADD" / "SCENARIO.CELLS" / "SCENARIO.DELETE" / "SCENARIO.EDIT" / "SCENARIO.MERGE"
/ "SCENARIO.SHOW" / "SCENARIO.SHOW.NEXT" / "SCENARIO.SUMMARY" / "SCROLLBAR.PROPERTIES" /
"SELECT" / "SELECT.ALL" / "SELECT.CHART" / "SELECT.END" / "SELECT.LAST.CELL" /
"SELECT.LIST.ITEM" / "SELECT.PLOT.AREA" / "SELECT.SPECIAL" / "SEND.KEYS" / "SEND.MAIL" /
"SEND.TO.BACK" / "SERIES.AXES" / "SERIES.ORDER" / "SERIES.X" / "SERIES.Y" /
"SET.CONTROL.VALUE" / "SET.CRITERIA" / "SET.DATABASE" / "SET.DIALOG.DEFAULT" /
"SET.DIALOG.FOCUS" / "SET.EXTRACT" / "SET.LIST.ITEM" / "SET.PAGE.BREAK" / "SET.PREFERRED" /
"SET.PRINT.AREA" / "SET.PRINT.TITLES" / "SET.UPDATE.STATUS" / "SHARE" / "SHARE.NAME" /
"SHEET.BACKGROUND" / "SHORT.MENUS" / "SHOW.ACTIVE.CELL" / "SHOW.CLIPBOARD" / "SHOW.DETAIL" /
"SHOW.DIALOG" / "SHOW.INFO" / "SHOW.LEVELS" / "SHOW.TOOLBAR" / "SORT" / "SORT.SPECIAL" /
"SOUND.NOTE" / "SOUND.PLAY" / "SPELLING" / "SPLIT" / "STANDARD.FONT" / "STANDARD.WIDTH" /
"STYLE" / "SUBSCRIBE.TO" / "SUBTOTAL.CREATE" / "SUBTOTAL.REMOVE" / "SUMMARY.INFO" /
"TAB.ORDER" / "TABLE" / "TEXT.TO.COLUMNS" / "TRACER.CLEAR" / "TRACER.DISPLAY" /
"TRACER.ERROR" / "TRACER.NAVIGATE" / "TRAVERSE.NOTES" / "UNDO" / "UNGROUP" / "UNGROUP.SHEETS"
/ "UNHIDE" / "UNLOCKED.NEXT" / "UNLOCKED.PREV" / "UNPROTECT.REVISIONS" / "UPDATE.LINK" /
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"VBA.INSERT.FILE" / "VBA.MAKE.ADDIN" / "VBA.PROCEDURE.DEFINITION" / "VBAActivate" / "VIEW.3D"
/ "VIEW.DEFINE" / "VIEW.DELETE" / "VIEW.SHOW" / "VLINE" / "VPAGE" / "VSCROLL" / "WAIT" /
"WEB.PUBLISH" / "WINDOW.MAXIMIZE" / "WINDOW.MINIMIZE" / "WINDOW.MOVE" / "WINDOW.RESTORE" /
"WINDOW.SIZE" / "WORKBOOK.ACTIVATE" / "WORKBOOK.ADD" / "WORKBOOK.COPY" / "WORKBOOK.DELETE" /
"WORKBOOK.HIDE" / "WORKBOOK.INSERT" / "WORKBOOK.MOVE" / "WORKBOOK.NAME" / "WORKBOOK.NEW" /
"WORKBOOK.NEXT" / "WORKBOOK.OPTIONS" / "WORKBOOK.PREV" / "WORKBOOK.PROTECT" /
"WORKBOOK.SCROLL" / "WORKBOOK.SELECT" / "WORKBOOK.TAB.SPLIT" / "WORKBOOK.UNHIDE" /
"WORKGROUP" / "WORKGROUP.OPTIONS" / "WORKSPACE" / "ZOOM") ["?"]
future-function-list = ("_xlfn." ("AGGREGATE" / "ACOT" / "ACOTH" / "ARABIC" / "BASE" /
"BETA.DIST" / "BETA.INV" / "BINOM.DIST" / "BINOM.DIST.RANGE" / "BINOM.INV" / "BITAND" /
"BITLSHIFT" / "BITOR" / "BITRSHIFT" / "BITXOR" / "BYCOL" / "BYROW" / "CEILING.MATH" /
"CEILING.PRECISE" / "CHISQ.DIST" / "CHISQ.DIST.RT" / "CHISQ.INV" / "CHISQ.INV.RT" /
"CHISQ.TEST" / "COMBINA" / "CONFIDENCE.NORM" / "CONFIDENCE.T" / "COT" / "COTH" /
"COVARIANCE.P" / "COVARIANCE.S" / "CSC" / "CSCH" / "DAYS" / "DECIMAL" / "ERF.PRECISE" /
"ERFC.PRECISE" / "EXPON.DIST" / "F.DIST" / "F.DIST.RT" / "F.INV" / "F.INV.RT" / "F.TEST" /
"FIELDVALUE" / "FILTERXML" / "FLOOR.MATH" / "FLOOR.PRECISE" / "FORMULATEXT" / "GAMMA" /
"GAMMA.DIST" / "GAMMA.INV" / "GAMMALN.PRECISE" / "GAUSS" / "HYPGEOM.DIST" / "IFNA" / "IMCOSH"
/ "IMCOT" / "IMCSC" / "IMCSCH" / "IMSEC" / "IMSECH" / "IMSINH" / "IMTAN" / "ISFORMULA" /
"ISOMITTED" / "ISOWEEKNUM" / "LAMBDA" / "LET" / "LOGNORM.DIST" / "LOGNORM.INV" / "MAKEARRAY"
/ "MAP" / "MODE.MULT" / "MODE.SNGL" / "MUNIT" / "NEGBINOM.DIST" / "NORM.DIST" / "NORM.INV" /
"NORM.S.DIST" / "NORM.S.INV" / "NUMBERVALUE" / "PDURATION" / "PERCENTILE.EXC" /
"PERCENTILE.INC" / "PERCENTRANK.EXC" / "PERCENTRANK.INC" / "PERMUTATIONA" / "PHI" /
"POISSON.DIST" / "QUARTILE.EXC" / "QUARTILE.INC" / "QUERYSTRING" / "RANDARRAY" / "RANK.AVG" /
"RANK.EQ" / "REDUCE" / "RRI" / "SCAN" / "SEC" / "SECH" / "SEQUENCE" / "SHEET" / "SHEETS" /
"SKEW.P" / "SORTBY" / "STDEV.P" / "STDEV.S" / "T.DIST" / "T.DIST.2T" / "T.DIST.RT" / "T.INV"
/ "T.INV.2T" / "T.TEST" / "UNICHAR" / "UNICODE" / "UNIQUE" / "VAR.P" / "VAR.S" / "WEBSERVICE"
/ "WEIBULL.DIST" / "XLOOKUP" /"XOR" / "Z.TEST")) / "ECMA.CEILING" / "ISO.CEILING" /
"NETWORKDAYS.INTL" / "WORKDAY.INTL" / "FORECAST.ETS" / "FORECAST.ETS.CONFINT" /
"FORECAST.ETS.SEASONALITY" / "FORECAST.LINEAR" / "FORECAST.ETS.STAT"
ref-function-call = "CHOOSE" choose-params / "IF" if-params / "INDEX" index-params /
"INDIRECT" indirect-params / "OFFSET" offset-params
future-function-call = ("_xlfn." ( ("ACOT" acot-params) / ("ACOTH" acoth-params) /
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params) / ("BINOM.DIST.RANGE" binom-dist-range-params) / ("BINOM.INV" binom-inv-params) /
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("CHISQ.INV" chisq-inv-params) / ("CHISQ.INV.RT" chisq-inv-rt-params) / ("CHISQ.TEST" chisq-
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("ERF.PRECISE" erf-precise-params) / ("ERFC.PRECISE" erfc-precise-params) / ("EXPON.DIST"
expon-dist-params) / ("F.DIST" f-dist-params) / ("F.DIST.RT" f-dist-rt-params) / ("F.INV" f-
inv-params) / ("F.INV.RT" f-inv-rt-params) / ("F.TEST" f-test-params) / ("FIELDVALUE"
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38 / 385

/ ("T.DIST.2T" t-dist-2t-params) / ("T.DIST.RT" t-dist-rt-params) / ("T.INV" t-inv-params) /
("T.INV.2T" t-inv-2t-params) / ("T.TEST" t-test-params) / ("UNICHAR" unichar-params) /
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("FORECAST.ETS" forecast-ets-params) / ("FORECAST.ETS.CONFINT" forecast-ets-confint-params) /
("FORECAST.ETS.SEASONALITY" forecast-ets-seasonality-params) / ("FORECAST.LINEAR" forecast-
linear-params) / ("FORECAST.ETS.STAT" forecast-ets-stat-params)
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params / "AMORLINC" amorlinc-params / "AND" and-params / "AREAS" areas-params / "ASC" asc-
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accrint-params = "(" argument "," argument "," argument "," argument "," argument ","
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acos-params = "(" argument-expression ")"
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acot-params = "(" argument-expression ")"
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arabic-params = "(" argument-expression ")"
areas-params = "(" ref-argument-expression ")"
asc-params = "(" argument-expression ")"
asinh-params = "(" argument-expression ")"
asin-params = "(" argument-expression ")"
atan2-params = "(" argument "," argument ")"
atanh-params = "(" argument-expression ")"

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atan-params = "(" argument-expression ")"
avedev-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
averagea-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
averageif-params = "(" ref-argument-expression "," argument ["," ref-argument-expression ]
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averageifs-params = "(" ref-argument-expression "," ref-argument-expression "," argument
*126("," ref-argument-expression "," argument) ")"
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bahttext-params = "(" argument-expression ")"
base-params = "(" argument "," argument ["," argument] ")"
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besselj-params = "(" argument "," argument ")"
besselk-params = "(" argument "," argument ")"
bessely-params = "(" argument "," argument ")"
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beta-inv-params = "(" argument "," argument "," argument ["," argument ["," argument]] ")"
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bin2hex-params = "(" (argument-expression / (argument "," argument)) ")"
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binom-inv-params = "(" argument "," argument "," argument ")"
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bitxor-params = "(" argument "," argument ")"
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byrow-params = "(" argument ["," argument] ")"
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ceiling-params = "(" argument "," argument ")"
ceiling-precise-params = "(" argument "," argument ")"
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char-params = "(" argument-expression ")"
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chiinv-params = "(" argument "," argument ")"
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chisq-dist-rt-params = "(" argument "," argument ")"
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chisq-test-params = "(" argument "," argument ")"
chitest-params = "(" argument "," argument ")"
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clean-params = "(" argument-expression ")"
code-params = "(" argument-expression ")"
column-params = "(" [ref-argument-expression ] ")"
columns-params = "(" argument-expression ")"
combina-params = "(" argument "," argument ")"
combin-params = "(" argument "," argument ")"
complex-params = "(" argument "," argument ["," argument] ")"
concat-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
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confidence-params = "(" argument "," argument "," argument ")"
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coth-params = "(" argument-expression ")"
cot-params = "(" argument-expression ")"
counta-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
countblank-params = "(" ref-argument-expression ")"
countif-params = "(" ref-argument-expression "," argument ")"
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"," argument) ")"
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date-params = "(" argument "," argument "," argument ")"
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datevalue-params = "(" argument-expression ")"
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day-params = "(" argument-expression ")"
days360-params = "(" argument "," argument ["," argument] ")"
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dbcs-params = "(" argument-expression ")"
db-params = "(" argument "," argument "," argument "," argument ["," argument] ")"
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dcount-params = "(" ref-argument-expression "," argument "," argument ")"
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dec2oct-params = "(" (argument-expression / (argument "," argument)) ")"
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degrees-params = "(" argument-expression ")"
delta-params = "(" (argument-expression / (argument "," argument)) ")"
devsq-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
dget-params = "(" ref-argument-expression "," argument "," argument ")"
disc-params = "(" argument "," argument "," argument "," argument ["," argument] ")"
dmax-params = "(" ref-argument-expression "," argument "," argument ")"
dmin-params = "(" ref-argument-expression "," argument "," argument ")"
dollarde-params = "(" argument "," argument ")"
dollarfr-params = "(" argument "," argument ")"
dollar-params = "(" (argument-expression / (argument "," argument)) ")"
dproduct-params = "(" ref-argument-expression "," argument "," argument ")"
dstdev-params = "(" ref-argument-expression "," argument "," argument ")"
dstdevp-params = "(" ref-argument-expression "," argument "," argument ")"
dsum-params = "(" ref-argument-expression "," argument "," argument ")"
duration-params = "(" argument "," argument "," argument "," argument "," argument ["," 
argument] ")"
dvar-params = "(" ref-argument-expression "," argument "," argument ")"
dvarp-params = "(" ref-argument-expression "," argument "," argument ")"
ecma-ceiling-params = "(" argument "," argument ")"
edate-params = "(" argument "," argument ")"
effect-params = "(" argument "," argument ")"
eomonth-params = "(" argument "," argument ")"
erfc-params = "(" argument-expression ")"
erfc-precise-params = "(" argument-expression ")"
erf-params = "(" (argument-expression / (argument "," argument)) ")"
erf-precise-params = "(" argument-expression ")"
```

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error-type-params = "(" argument-expression ")"
even-params = "(" argument-expression ")"
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expon-dist-params = "(" argument "," argument "," argument ")"
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f-dist-params = "(" argument "," argument "," argument "," argument ")"
f-dist-rt-params = "(" argument "," argument "," argument ")"
fieldvalue-params = "(" argument "," argument ")"
filterxml-params = "(" argument "," argument ")"
findb-params = "(" argument "," argument ["," argument] ")"
find-params = "(" argument "," argument ["," argument] ")"
finv-params = "(" argument "," argument "," argument ")"
f-inv-params = "(" argument "," argument "," argument ")"
f-inv-rt-params = "(" argument "," argument "," argument ")"
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fisher-params = "(" argument-expression ")"
fixed-params = "(" (argument-expression / (argument "," argument ["," argument])) ")"
floor-math-params = "(" (argument-expression / (argument "," argument ["," argument])) ")"
floor-params = "(" argument "," argument ")"
floor-precise-params = "(" argument "," argument ")"
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forecast-linear-params = "(" argument "," argument "," argument ")"
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["," argument] ")"
forecast-ets-confint-params = "(" argument "," argument "," argument ["," argument] [","
argument] ["," argument] ["," argument] ")"
forecast-ets-seasonality-params = "(" argument "," argument ["," argument] ["," argument] ")"
forecast-ets-stat-params = "(" argument "," argument "," argument ["," argument] [","
argument] ["," argument] ")"
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frequency-params = "(" argument "," argument ")"
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f-test-params = "(" argument "," argument ")"
fv-params = "(" argument "," argument "," argument ["," argument ["," argument]] ")"
fvschedule-params = "(" argument "," argument ")"
gammadist-params = "(" argument "," argument "," argument "," argument ")"
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gammainv-params = "(" argument "," argument "," argument ")"
gamma-inv-params = "(" argument "," argument "," argument ")"
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gammaln-precise-params = "(" argument-expression ")"
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gauss-params = "(" argument-expression ")"
gcd-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
geomean-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
gestep-params = "(" (argument-expression / (argument "," argument)) ")"
getpivotdata-params = "(" argument "," argument ["," argument ["," argument *125("," argument
"," argument)]] ")"
growth-params = "(" (argument-expression / (argument "," argument ["," argument ["," 
argument]])) ")"
harmean-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
hex2bin-params = "(" (argument-expression / (argument "," argument)) ")"
hex2dec-params = "(" argument-expression ")"
hex2oct-params = "(" (argument-expression / (argument "," argument)) ")"
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hypgeom-dist-params = "(" argument "," argument "," argument "," argument "," argument ")"
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ifna-params = "(" argument "," argument ")"
if-params = "(" (argument-expression / (argument "," argument ["," argument])) ")"
ifs-params = "(" argument "," argument *126(","argument "," argument) ")"
imabs-params = "(" argument-expression ")"
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imargument-params = "(" argument-expression ")"
imconjugate-params = "(" argument-expression ")"
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imcos-params = "(" argument-expression ")"
imcot-params = "(" argument-expression ")"
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impower-params = "(" argument "," argument ")"
improduct-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
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imsin-params = "(" argument-expression ")"
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imsum-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
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info-params = "(" argument-expression ")"
intercept-params = "(" argument "," argument ")"
int-params = "(" argument-expression ")"
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argument]] ")"
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iserr-params = "(" argument-expression ")"
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iso-ceiling-params = "(" (argument-expression / (argument "," argument)) ")"
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isomitted-params = "(" argument-expression ")"
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istext-params = "(" argument-expression ")"
isthaidigit-params = "(" argument-expression ")"
kurt-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
lambda-params = "(" *252(lambda-parameter-name ",") argument ")"
large-params = "(" argument "," argument ")"
lcm-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
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left-params = "(" (argument-expression / (argument "," argument)) ")"
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len-params = "(" argument-expression ")"
let-params = "(" 1*126(parameter-name "," argument) "," argument ")"
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argument]])) ")"
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log10-params = "(" argument-expression ")"
logest-params = "(" (argument-expression / (argument "," argument ["," argument ["," 
argument]])) ")"
loginv-params = "(" argument "," argument "," argument ")"
lognormdist-params = "(" argument "," argument "," argument ")"
lognorm-dist-params = "(" argument "," argument "," argument "," argument ")"
lognorm-inv-params = "(" argument "," argument "," argument ")"
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lookup-params = "(" argument "," argument ["," argument] ")"
lower-params = "(" argument-expression ")"
makearray-params = "(" argument "," argument "," argument ")"
map-params = "(" 2*252(argument ",") argument ")"
match-params = "(" argument "," argument ["," argument] ")"
maxa-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
max-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
maxifs-params = "(" ref-argument-expression "," ref-argument-expression "," argument *125(","
ref-argument-expression "," argument) ")"
mdeterm-params = "(" argument-expression ")"
mduration-params = "(" argument "," argument "," argument "," argument "," argument [","
argument] ")"
median-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
midb-params = "(" argument "," argument "," argument ")"
mid-params = "(" argument "," argument "," argument ")"
mina-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
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ref-argument-expression "," argument) ")"
minute-params = "(" argument-expression ")"
minverse-params = "(" argument-expression ")"
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mode-mult-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
mode-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
mode-sngl-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
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month-params = "(" argument-expression ")"
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networkdays-params = "(" argument "," argument ["," argument] ")"
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norminv-params = "(" argument "," argument "," argument ")"
norm-inv-params = "(" argument "," argument "," argument ")"
norm-s-dist-params = "(" argument "," argument ")"
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norm-s-inv-params = "(" argument-expression ")"
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numbervalue-params = "(" (argument-expression / (argument "," argument ["," argument])) ")"
oct2bin-params = "(" (argument-expression / (argument "," argument)) ")"
oct2dec-params = "(" argument-expression ")"
oct2hex-params = "(" (argument-expression / (argument "," argument)) ")"
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argument "," argument "," argument ["," argument] ")"
oddlprice-params = "(" argument "," argument "," argument "," argument "," argument ","
argument "," argument ["," argument] ")"
oddlyield-params = "(" argument "," argument "," argument "," argument "," argument ","
argument "," argument ["," argument] ")"
odd-params = "(" argument-expression ")"
offset-params = "(" ref-argument-expression "," argument "," argument ["," argument [","
argument]] ")"
or-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
pduration-params = "(" argument "," argument "," argument ")"
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```
pearson-params = "(" argument "," argument ")"
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percentile-inc-params = "(" argument "," argument ")"
percentile-params = "(" argument "," argument ")"
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percentrank-inc-params = "(" argument "," argument ["," argument] ")"
percentrank-params = "(" argument "," argument ["," argument] ")"
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permut-params = "(" argument "," argument ")"
phi-params = "(" argument-expression ")"
phonetic-params = "(" ref-argument-expression ")"
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poisson-dist-params = "(" argument "," argument "," argument ")"
poisson-params = "(" argument "," argument "," argument ")"
power-params = "(" argument "," argument ")"
ppmt-params = "(" argument "," argument "," argument "," argument ["," argument ["," 
argument]] ")"
pricedisc-params = "(" argument "," argument "," argument "," argument ["," argument] ")"
pricemat-params = "(" argument "," argument "," argument "," argument "," argument ["," 
argument] ")"
price-params = "(" argument "," argument "," argument "," argument "," argument "," argument 
["," argument] ")"
prob-params = "(" argument "," argument "," argument ["," argument] ")"
product-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
proper-params = "(" argument-expression ")"
pv-params = "(" argument "," argument "," argument ["," argument ["," argument]] ")"
quartile-exc-params = "(" argument "," argument ")"
quartile-inc-params = "(" argument "," argument ")"
quartile-params = "(" argument "," argument ")"
querystring-params = "(" argument "," argument *126( "," argument "," argument) ")"
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radians-params = "(" argument-expression ")"
randarray-params = "(" [argument *4("," argument)] ")"
randbetween-params = "(" argument "," argument ")"
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rank-avg-params = "(" argument "," ref-argument-expression ["," argument] ")"
rank-eq-params = "(" argument "," ref-argument-expression ["," argument] ")"
rank-params = "(" argument "," ref-argument-expression ["," argument] ")"
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reduce-params = "(" argument "," argument "," argument ")"
replaceb-params = "(" argument "," argument "," argument "," argument ")"
replace-params = "(" argument "," argument "," argument "," argument ")"
rept-params = "(" argument "," argument ")"
rightb-params = "(" (argument-expression / (argument "," argument)) ")"
right-params = "(" (argument-expression / (argument "," argument)) ")"
roman-params = "(" (argument-expression / (argument "," argument)) ")"
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roundbahtup-params = "(" argument-expression ")"
rounddown-params = "(" argument "," argument ")"
round-params = "(" argument "," argument ")"
roundup-params = "(" argument "," argument ")"
row-params = "(" [ref-argument-expression ] ")"
rows-params = "(" argument-expression ")"
rri-params = "(" argument "," argument "," argument ")"
rsq-params = "(" argument "," argument ")"
rtd-params = "(" argument "," argument "," argument *252("," argument) ")"
scan-params = "(" argument "," argument "," argument ")"
searchb-params = "(" argument "," argument ["," argument] ")"
search-params = "(" argument "," argument ["," argument] ")"
sech-params = "(" argument-expression ")"
second-params = "(" argument-expression ")"
sec-params = "(" argument-expression ")"
sequence-params = "("argument *3("," argument) ")"
series-params = "(" argument "," argument "," argument "," argument ["," argument] ")"
seriessum-params = "(" argument "," argument "," argument "," argument ")"
sheet-params = "(" argument ")"
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sheets-params = "(" argument ")"
sign-params = "(" argument-expression ")"
sinh-params = "(" argument-expression ")"
sin-params = "(" argument-expression ")"
skew-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
skew-p-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
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slope-params = "(" argument "," argument ")"
small-params = "(" argument "," argument ")"
sortby-params = "(" argument "," argument ["," argument *125("," argument "," argument)] ")"
sqrt-params = "(" argument-expression ")"
sqrtpi-params = "(" argument-expression ")"
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stdev-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
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stdevp-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
stdev-s-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
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substitute-params = "(" argument "," argument "," argument ["," argument] ")"
subtotal-params = "(" argument "," ref-argument-expression *253("," ref-argument-expression )
")"
sumif-params = "(" ref-argument-expression "," argument ["," ref-argument-expression ] ")"
sumifs-params = "(" ref-argument-expression "," ref-argument-expression "," argument *126(","
ref-argument-expression "," argument) ")"
sum-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
sumproduct-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
sumsq-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
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sumxmy2-params = "(" argument "," argument ")"
switch-params = "(" argument "," argument "," argument 1*251("," argument) ")"
syd-params = "(" argument "," argument "," argument "," argument ")"
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tan-params = "(" argument-expression ")"
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tbillprice-params = "(" argument "," argument "," argument ")"
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tdist-params = "(" argument "," argument "," argument ")"
t-dist-params = "(" argument "," argument "," argument ")"
t-dist-rt-params = "(" argument "," argument ")"
text-params = "(" argument "," argument ")"
textjoin-params = "(" argument "," argument "," argument *251("," argument) ")"
thaidayofweek-params = "(" argument-expression ")"
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thaimonthofyear-params = "(" argument-expression ")"
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thaiyear-params = "(" argument-expression ")"
time-params = "(" argument "," argument "," argument ")"
timevalue-params = "(" argument-expression ")"
t-inv-2t-params = "(" argument "," argument ")"
tinv-params = "(" argument "," argument ")"
t-inv-params = "(" argument "," argument ")"
today-params = emptyparams
t-params = "(" argument-expression ")"
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trend-params = "(" (argument-expression / (argument "," argument ["," argument ["," 
argument]])) ")"
trimmean-params = "(" argument "," argument ")"
trim-params = "(" argument-expression ")"
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type-params = "(" argument-expression ")"
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```
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unicode-params = "(" argument-expression ")"
unique-params = "(" argument *2("," argument) ")"
upper-params = "(" argument-expression ")"
usdollar-params = "(" (argument-expression / (argument "," argument)) ")"
value-params = "(" argument-expression ")"
vara-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
varpa-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
var-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
var-p-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
varp-params = "(" (argument-expression / (argument 1*254("," argument))) ")"
var-s-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
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["," argument]] ")"
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webservice-params = "(" (argument-expression / (argument "," argument)) ")"
weekday-params = "(" (argument-expression / (argument "," argument)) ")"
weeknum-params = "(" (argument-expression / (argument "," argument)) ")"
weibull-dist-params = "(" argument "," argument "," argument "," argument ")"
weibull-params = "(" argument "," argument "," argument "," argument ")"
workday-intl-params = "(" argument "," argument ["," argument ["," argument]] ")"
workday-params = "(" argument "," argument ["," argument] ")"
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xnpv-params = "(" argument "," argument "," argument ")"
xlookup-params = "(" argument "," argument "," argument *3("," argument) ")"
xor-params = "(" (argument-expression / (argument 1*253("," argument))) ")"
yearfrac-params = "(" argument "," argument ["," argument] ")"
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yielddisc-params = "(" argument "," argument "," argument "," argument ["," argument] ")"
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argument] ")"
yield-params = "(" argument "," argument "," argument "," argument "," argument "," argument
["," argument] ")"
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z-test-params = "(" argument "," argument ["," argument] ")"


ref-macro-function-call = "ABSREF" absref-params / "ACTIVE.CELL" active-cell-params / "CALL"
call-params / "CALLER" caller-params / "EVALUATE" evaluate-params / "GET.DOCUMENT" get-
document-params / "INPUT" input-params / "LAST.ERROR" last-error-params / "SCENARIO.GET"
scenario-get-params / "SELECTION" selection-params / "TEXTREF" textref-params / "VIEW.GET"
view-get-params
macro-function-call = ref-macro-function-call / "ADD.BAR" add-bar-params / "ADD.COMMAND" add-
command-params / "ADD.MENU" add-menu-params / "ADD.TOOLBAR" add-toolbar-params / "APP.TITLE"
app-title-params / "ARGUMENT" argument-params / "BREAK" break-params / "CANCEL.KEY" cancel-
key-params / "CHECK.COMMAND" check-command-params / "CREATE.OBJECT" create-object-params /
"CUSTOM.REPEAT" custom-repeat-params / "CUSTOM.UNDO" custom-undo-params / "DELETE.BAR"
delete-bar-params / "DELETE.COMMAND" delete-command-params / "DELETE.MENU" delete-menu-params
/ "DELETE.TOOLBAR" delete-toolbar-params / "DEREF" deref-params / "DIALOG.BOX" dialog-box-
params / "DIRECTORY" directory-params / "DOCUMENTS" documents-params / "ECHO" echo-params /
"ELSE" else-params / "ELSE.IF" else-if-params / "ENABLE.COMMAND" enable-command-params /
"ENABLE.TOOL" enable-tool-params / "END.IF" end-if-params / "ERROR" error-params / "EXEC"
exec-params / "EXECUTE" execute-params / "FCLOSE" fclose-params / "FILES" files-params /
"FOPEN" fopen-params / "FOR" for-params / "FOR.CELL" for-cell-params / "FORMULA.CONVERT"
formula-convert-params / "FPOS" fpos-params / "FREAD" fread-params / "FREADLN" freadln-params
/ "FSIZE" fsize-params / "FWRITE" fwrite-params / "FWRITELN" fwriteln-params / "GET.BAR" get-
bar-params / "GET.CELL" get-cell-params / "GET.CHART.ITEM" get-chart-item-params / "GET.DEF"
get-def-params / "GET.FORMULA" get-formula-params / "GET.LINK.INFO" get-link-info-params /
"GET.MOVIE" get-movie-params / "GET.NAME" get-name-params / "GET.NOTE" get-note-params /
"GET.OBJECT" get-object-params / "GET.TOOL" get-tool-params / "GET.TOOLBAR" get-toolbar-
params / "GET.WINDOW" get-window-params / "GET.WORKBOOK" get-workbook-params /
"GET.WORKSPACE" get-workspace-params / "GOTO" goto-params / "GROUP" group-params / "HALT"
halt-params / "HELP" help-params / "INITIATE" initiate-params / "LINKS" links-params /
"MOVIE.COMMAND" movie-command-params / "NAMES" names-params / "NEXT" next-params / "NOTE"
note-params / "OPEN.DIALOG" open-dialog-params / "OPTIONS.LISTS.GET" options-lists-get-params
/ "PAUSE" pause-params / "POKE" poke-params / "PRESS.TOOL" press-tool-params / "REFTEXT"
reftext-params / "REGISTER" register-params / "REGISTER.ID" register-id-params / "RELREF"
relref-params / "RENAME.COMMAND" rename-command-params / "REQUEST" request-params /
"RESET.TOOLBAR" reset-toolbar-params / "RESTART" restart-params / "RESULT" result-params /
"RESUME" resume-params / "RETURN" return-params / "SAVE.DIALOG" save-dialog-params /
```

```
"SAVE.TOOLBAR" save-toolbar-params  / "SET.NAME" set-name-params / "SET.VALUE" set-value-
params / "SHOW.BAR" show-bar-params / "SPELLING.CHECK" spelling-check-params / "STEP" step-
params / "TERMINATE" terminate-params / "TEXT.BOX" text-box-params / "UNREGISTER" unregister-
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active-cell-font-params = "(" argument *13("," argument) ")"
add-arrow-params = "(" *space ")"
add-chart-autoformat-params = "(" argument ["," argument] ")"
add-list-item-params = "(" argument ["," argument] ")"
add-overlay-params = "(" *space ")"
add-print-area-params = "(" *space ")"
add-tool-params = "(" argument *2("," argument) ")"
addin-manager-params = "(" argument *2("," argument) ")"
alert-params = "(" argument *2("," argument) ")"
alignment-params = "(" argument *9("," argument) ")"
app-activate-params = "(" argument ["," argument] ")"
app-activate-microsoft-params = "(" argument ")"
app-maximize-params = "(" *space ")"
app-minimize-params = "(" *space ")"
app-move-params = "(" argument ["," argument] ")"
app-restore-params = "(" *space ")"
app-size-params = "(" argument ["," argument] ")"
apply-names-params = "(" argument *6("," argument) ")"
apply-style-params = "(" argument ")"
arrange-all-params = "(" argument *3("," argument) ")"
assign-to-object-params = "(" argument ")"
assign-to-tool-params = "(" argument *2("," argument) ")"
attach-text-params = "(" argument *2("," argument) ")"
attach-toolbars-params = "(" *space ")"
attributes-params = "(" argument ["," argument] ")"
auto-outline-params = "(" *space ")"
autocorrect-params = "(" argument ["," argument] ")"
axes-params = "(" argument *5("," argument) ")"
beep-params = "(" argument ")"
border-params = "(" argument *26("," argument) ")"
bring-to-front-params = "(" *space ")"
calculate-document-params = "(" *space ")"
calculate-now-params = "(" *space ")"
calculation-params = "(" argument *10("," argument) ")"
cancel-copy-params = "(" argument ")"
cell-protection-params = "(" argument ["," argument] ")"
change-link-params = "(" argument *2("," argument) ")"
chart-add-data-params = "(" argument *5("," argument) ")"
chart-trend-params = "(" argument *7("," argument) ")"
```

```
chart-wizard-params = "(" argument *13("," argument) ")"
checkbox-properties-params = "(" argument *4("," argument) ")"
clear-params = "(" argument ")"
clear-outline-params = "(" *space ")"
clear-print-area-params = "(" *space ")"
clear-routing-slip-params = "(" argument ")"
close-params = "(" argument ["," argument] ")"
close-all-params = "(" *space ")"
color-palette-params = "(" argument ")"
column-width-params = "(" argument *4("," argument) ")"
combination-params = "(" argument ")"
consolidate-params = "(" argument *4("," argument) ")"
constrain-numeric-params = "(" argument ")"
copy-params = "(" argument ["," argument] ")"
copy-chart-params = "(" argument ")"
copy-picture-params = "(" argument *2("," argument) ")"
copy-tool-params = "(" argument ["," argument] ")"
create-names-params = "(" argument *3("," argument) ")"
create-publisher-params = "(" argument *3("," argument) ")"
customize-toolbar-params = "(" argument ")"
cut-params = "(" argument ["," argument] ")"
data-delete-params = "(" *space ")"
data-find-params = "(" argument ")"
data-find-next-params = "(" *space ")"
data-find-prev-params = "(" *space ")"
data-form-params = "(" *space ")"
data-label-params = "(" argument *9("," argument) ")"
data-series-params = "(" argument *5("," argument) ")"
define-name-params = "(" argument *6("," argument) ")"
define-style-params = "(" argument *13("," argument) ")"
delete-arrow-params = "(" *space ")"
delete-chart-autoformat-params = "(" argument ")"
delete-format-params = "(" argument ")"
delete-name-params = "(" argument ")"
delete-note-params = "(" argument ")"
delete-overlay-params = "(" *space ")"
delete-style-params = "(" argument ")"
delete-tool-params = "(" argument ["," argument] ")"
demote-params = "(" argument ")"
disable-input-params = "(" argument ")"
display-params = "(" argument *8("," argument) ")"
duplicate-params = "(" *space ")"
edit-color-params = "(" argument *3("," argument) ")"
edit-delete-params = "(" argument ")"
edit-object-params = "(" argument ")"
edit-repeat-params = "(" *space ")"
edit-series-params = "(" argument *6("," argument) ")"
edit-tool-params = "(" argument ["," argument] ")"
editbox-properties-params = "(" argument *3("," argument) ")"
edition-options-params = "(" argument *6("," argument) ")"
enable-object-params = "(" argument ["," argument] ")"
enable-tipwizard-params = "(" argument ")"
enter-data-params = "(" argument ")"
errorbar-x-params = "(" argument *3("," argument) ")"
errorbar-y-params = "(" argument *3("," argument) ")"
extend-polygon-params = "(" argument ")"
extract-params = "(" argument ")"
file-close-params = "(" argument ["," argument] ")"
file-delete-params = "(" argument ")"
fill-auto-params = "(" argument ["," argument] ")"
fill-down-params = "(" *space ")"
fill-group-params = "(" argument ")"
fill-left-params = "(" *space ")"
fill-right-params = "(" *space ")"
fill-up-params = "(" *space ")"
filter-params = "(" argument *5("," argument) ")"
filter-advanced-params = "(" argument *4("," argument) ")"
filter-show-all-params = "(" *space ")"
find-file-params = "(" *space ")"
```

54 / 385

```
font-params = "(" argument ["," argument] ")"
font-properties-params = "(" argument *13("," argument) ")"
format-auto-params = "(" argument *6("," argument) ")"
format-chart-params = "(" argument *17("," argument) ")"
format-charttype-params = "(" argument *3("," argument) ")"
format-font-params = "(" argument *14("," argument) ")"
format-legend-params = "(" argument ")"
format-main-params = "(" argument *13("," argument) ")"
format-move-params = "(" argument *2("," argument) ")"
format-number-params = "(" argument ")"
format-overlay-params = "(" argument *13("," argument) ")"
format-shape-params = "(" argument *4("," argument) ")"
format-size-params = "(" argument *2("," argument) ")"
format-text-params = "(" argument *10("," argument) ")"
formula-params = "(" argument ["," argument] ")"
formula-array-params = "(" argument ["," argument] ")"
formula-fill-params = "(" argument ["," argument] ")"
formula-find-params = "(" argument *11("," argument) ")"
formula-find-next-params = "(" *space ")"
formula-find-prev-params = "(" *space ")"
formula-goto-params = "(" argument ["," argument] ")"
formula-replace-params = "(" argument *10("," argument) ")"
freeze-panes-params = "(" argument *2("," argument) ")"
full-params = "(" argument ")"
full-screen-params = "(" argument ")"
function-wizard-params = "(" argument ")"
gallery-3d-area-params = "(" argument ")"
gallery-3d-bar-params = "(" argument ")"
gallery-3d-column-params = "(" argument ")"
gallery-3d-line-params = "(" argument ")"
gallery-3d-pie-params = "(" argument ")"
gallery-3d-surface-params = "(" argument ")"
gallery-area-params = "(" argument ["," argument] ")"
gallery-bar-params = "(" argument ["," argument] ")"
gallery-column-params = "(" argument ["," argument] ")"
gallery-custom-params = "(" argument ")"
gallery-doughnut-params = "(" argument ["," argument] ")"
gallery-line-params = "(" argument ["," argument] ")"
gallery-pie-params = "(" argument ["," argument] ")"
gallery-radar-params = "(" argument ["," argument] ")"
gallery-scatter-params = "(" argument ["," argument] ")"
goal-seek-params = "(" argument *2("," argument) ")"
gridlines-params = "(" argument *6("," argument) ")"
hide-params = "(" *space ")"
hide-dialog-params = "(" argument ")"
hide-object-params = "(" argument ["," argument] ")"
hideall-inkannots-params = "(" argument ")"
hideall-notes-params = "(" argument ")"
hidecurr-note-params = "(" argument ["," argument] ")"
hline-params = "(" argument ")"
hpage-params = "(" argument ")"
hscroll-params = "(" argument ["," argument] ")"
insert-params = "(" argument ["," argument] ")"
insert-map-object-params = "(" *space ")"
insert-object-params = "(" argument *12("," argument) ")"
insert-picture-params = "(" argument ["," argument] ")"
insert-title-params = "(" argument *4("," argument) ")"
insertdatatable-params = "(" argument ")"
justify-params = "(" *space ")"
label-properties-params = "(" argument *2("," argument) ")"
layout-params = "(" *space ")"
legend-params = "(" argument ")"
line-print-params = "(" argument *10("," argument) ")"
link-combo-params = "(" argument ")"
link-format-params = "(" *space ")"
list-names-params = "(" *space ")"
listbox-properties-params = "(" argument *4("," argument) ")"
macro-options-params = "(" argument *9("," argument) ")"
mail-add-mailer-params = "(" *space ")"
```

```
mail-delete-mailer-params = "(" *space ")"
mail-edit-mailer-params = "(" argument *5("," argument) ")"
mail-forward-params = "(" *space ")"
mail-logoff-params = "(" *space ")"
mail-logon-params = "(" argument *2("," argument) ")"
mail-next-letter-params = "(" *space ")"
mail-reply-params = "(" *space ")"
mail-reply-all-params = "(" *space ")"
mail-send-mailer-params = "(" argument ["," argument] ")"
main-chart-params = "(" argument *9("," argument) ")"
main-chart-type-params = "(" argument ")"
menu-editor-params = "(" *space ")"
merge-styles-params = "(" argument ")"
message-params = "(" argument ["," argument] ")"
move-brk-params = "(" argument *3("," argument) ")"
move-tool-params = "(" argument *5("," argument) ")"
new-params = "(" argument *2("," argument) ")"
new-window-params = "(" *space ")"
newwebquery-params = "(" argument ")"
normal-params = "(" *space ")"
object-properties-params = "(" argument ["," argument] ")"
object-protection-params = "(" argument ["," argument] ")"
on-data-params = "(" argument ["," argument] ")"
on-doubleclick-params = "(" argument ["," argument] ")"
on-entry-params = "(" argument ["," argument] ")"
on-key-params = "(" argument ["," argument] ")"
on-recalc-params = "(" argument ["," argument] ")"
on-sheet-params = "(" argument *2("," argument) ")"
on-time-params = "(" argument *3("," argument) ")"
on-window-params = "(" argument ["," argument] ")"
open-params = "(" argument *16("," argument) ")"
open-links-params = "(" argument *14("," argument) ")"
open-mail-params = "(" argument ["," argument] ")"
open-text-params = "(" argument *16("," argument) ")"
options-calculation-params = "(" argument *9("," argument) ")"
options-chart-params = "(" argument *2("," argument) ")"
options-edit-params = "(" argument *10("," argument) ")"
options-general-params = "(" argument *13("," argument) ")"
options-lists-add-params = "(" argument ["," argument] ")"
options-lists-delete-params = "(" argument ")"
options-me-params = "(" argument *8("," argument) ")"
options-menono-params = "(" argument *4("," argument) ")"
options-save-params = "(" argument *3("," argument) ")"
options-spell-params = "(" argument *11("," argument) ")"
options-transition-params = "(" argument *4("," argument) ")"
options-view-params = "(" argument *17("," argument) ")"
outline-params = "(" argument *3("," argument) ")"
overlay-params = "(" argument *11("," argument) ")"
overlay-chart-type-params = "(" argument ")"
page-setup-params = "(" argument *29("," argument) ")"
parse-params = "(" argument ["," argument] ")"
paste-params = "(" argument ")"
paste-link-params = "(" *space ")"
paste-picture-params = "(" *space ")"
paste-picture-link-params = "(" *space ")"
paste-special-params = "(" argument *6("," argument) ")"
paste-tool-params = "(" argument ["," argument] ")"
patterns-params = "(" argument *12("," argument) ")"
picklist-params = "(" *space ")"
pivot-add-fields-params = "(" argument *4("," argument) ")"
pivot-field-params = "(" argument *3("," argument) ")"
pivot-field-group-params = "(" argument *3("," argument) ")"
pivot-field-properties-params = "(" argument *6("," argument) ")"
pivot-field-ungroup-params = "(" *space ")"
pivot-item-params = "(" argument *3("," argument) ")"
pivot-item-properties-params = "(" argument *6("," argument) ")"
pivot-refresh-params = "(" argument ")"
pivot-show-pages-params = "(" argument ["," argument] ")"
pivot-table-chart-params = "(" argument *15("," argument) ")"
```

```
pivot-table-wizard-params = "(" argument *15("," argument) ")"
post-document-params = "(" argument ")"
precision-params = "(" argument ")"
preferred-params = "(" *space ")"
print-params = "(" argument *16("," argument) ")"
print-preview-params = "(" argument ")"
printer-setup-params = "(" argument ")"
promote-params = "(" argument ")"
protect-document-params = "(" argument *6("," argument) ")"
protect-revisions-params = "(" *space ")"
pushbutton-properties-params = "(" argument *5("," argument) ")"
quit-params = "(" *space ")"
remove-list-item-params = "(" argument ["," argument] ")"
remove-page-break-params = "(" argument ["," argument] ")"
rename-object-params = "(" argument ")"
replace-font-params = "(" argument *9("," argument) ")"
reset-tool-params = "(" argument ["," argument] ")"
rm-print-area-params = "(" argument ")"
route-document-params = "(" *space ")"
routing-slip-params = "(" argument *5("," argument) ")"
row-height-params = "(" argument *3("," argument) ")"
run-params = "(" argument ["," argument] ")"
save-params = "(" *space ")"
save-as-params = "(" argument *6("," argument) ")"
save-copy-as-params = "(" argument ")"
save-new-object-params = "(" argument ")"
save-workbook-params = "(" argument *5("," argument) ")"
save-workspace-params = "(" argument ")"
scale-params = "(" argument *9("," argument) ")"
scenario-add-params = "(" argument *5("," argument) ")"
scenario-cells-params = "(" argument ")"
scenario-delete-params = "(" argument ")"
scenario-edit-params = "(" argument *6("," argument) ")"
scenario-merge-params = "(" argument ")"
scenario-show-params = "(" argument ")"
scenario-show-next-params = "(" *space ")"
scenario-summary-params = "(" argument ["," argument] ")"
scrollbar-properties-params = "(" argument *6("," argument) ")"
select-params = "(" argument ["," argument] ")"
select-all-params = "(" *space ")"
select-chart-params = "(" *space ")"
select-end-params = "(" argument ")"
select-last-cell-params = "(" *space ")"
select-list-item-params = "(" argument ["," argument] ")"
select-plot-area-params = "(" *space ")"
select-special-params = "(" argument *2("," argument) ")"
send-keys-params = "(" argument ["," argument] ")"
send-mail-params = "(" argument *2("," argument) ")"
send-to-back-params = "(" *space ")"
series-axes-params = "(" argument ")"
series-order-params = "(" argument *2("," argument) ")"
series-x-params = "(" argument ")"
series-y-params = "(" argument ["," argument] ")"
set-control-value-params = "(" argument ")"
set-criteria-params = "(" *space ")"
set-database-params = "(" *space ")"
set-dialog-default-params = "(" argument ")"
set-dialog-focus-params = "(" argument ")"
set-extract-params = "(" *space ")"
set-list-item-params = "(" argument ["," argument] ")"
set-page-break-params = "(" *space ")"
set-preferred-params = "(" argument ")"
set-print-area-params = "(" argument ")"
set-print-titles-params = "(" argument ["," argument] ")"
set-update-status-params = "(" argument *2("," argument) ")"
share-params = "(" *space ")"
share-name-params = "(" argument ")"
sheet-background-params = "(" argument ["," argument] ")"
short-menus-params = "(" argument ")"
```

```
show-active-cell-params = "(" *space ")"
show-clipboard-params = "(" *space ")"
show-detail-params = "(" argument *3("," argument) ")"
show-dialog-params = "(" argument ")"
show-info-params = "(" argument ")"
show-levels-params = "(" argument ["," argument] ")"
show-toolbar-params = "(" argument *9("," argument) ")"
sort-params = "(" argument *16("," argument) ")"
sort-special-params = "(" argument *13("," argument) ")"
sound-note-params = "(" argument *2("," argument) ")"
sound-play-params = "(" argument *2("," argument) ")"
spelling-params = "(" argument *5("," argument) ")"
split-params = "(" argument ["," argument] ")"
standard-font-params = "(" argument *8("," argument) ")"
standard-width-params = "(" argument ")"
style-params = "(" argument ["," argument] ")"
subscribe-to-params = "(" argument ["," argument] ")"
subtotal-create-params = "(" argument *5("," argument) ")"
subtotal-remove-params = "(" *space ")"
summary-info-params = "(" argument *4("," argument) ")"
tab-order-params = "(" *space ")"
table-params = "(" argument ["," argument] ")"
text-to-columns-params = "(" argument *13("," argument) ")"
tracer-clear-params = "(" *space ")"
tracer-display-params = "(" argument ["," argument] ")"
tracer-error-params = "(" *space ")"
tracer-navigate-params = "(" argument *2("," argument) ")"
traverse-notes-params = "(" argument ["," argument] ")"
undo-params = "(" *space ")"
ungroup-params = "(" *space ")"
ungroup-sheets-params = "(" *space ")"
unhide-params = "(" argument ")"
unlocked-next-params = "(" *space ")"
unlocked-prev-params = "(" *space ")"
unprotect-revisions-params = "(" *space ")"
update-link-params = "(" argument ["," argument] ")"
vba-insert-file-params = "(" argument ")"
vba-make-addin-params = "(" argument ")"
vba-procedure-definition-params = "(" *space ")"
vbaactivate-params = "(" argument ["," argument] ")"
view-3d-params = "(" argument *5("," argument) ")"
view-define-params = "(" argument *2("," argument) ")"
view-delete-params = "(" argument ")"
view-show-params = "(" argument ")"
vline-params = "(" argument ")"
vpage-params = "(" argument ")"
vscroll-params = "(" argument ["," argument] ")"
wait-params = "(" argument ")"
web-publish-params = "(" argument *8("," argument) ")"
window-maximize-params = "(" argument ")"
window-minimize-params = "(" argument ")"
window-move-params = "(" argument *2("," argument) ")"
window-restore-params = "(" argument ")"
window-size-params = "(" argument *2("," argument) ")"
workbook-activate-params = "(" argument ["," argument] ")"
workbook-add-params = "(" argument *2("," argument) ")"
workbook-copy-params = "(" argument *2("," argument) ")"
workbook-delete-params = "(" argument ")"
workbook-hide-params = "(" argument ["," argument] ")"
workbook-insert-params = "(" argument ")"
workbook-move-params = "(" argument *2("," argument) ")"
workbook-name-params = "(" argument ["," argument] ")"
workbook-new-params = "(" argument *2("," argument) ")"
workbook-next-params = "(" *space ")"
workbook-options-params = "(" argument *2("," argument) ")"
workbook-prev-params = "(" *space ")"
workbook-protect-params = "(" argument *2("," argument) ")"
workbook-scroll-params = "(" argument ["," argument] ")"
workbook-select-params = "(" argument *2("," argument) ")"
```

```
workbook-tab-split-params = "(" argument ")"
workbook-unhide-params = "(" argument ")"
workgroup-params = "(" argument ")"
workgroup-options-params = "(" *space ")"
workspace-params = "(" argument *15("," argument) ")"
zoom-params = "(" argument ")"
```

2.2.2.1 Cell Formulas

A **cell** formula is a **formula** that adheres to the grammar specified in section 2.2.2, with the following restrictions:

▪ The formula MUST NOT use the bang-reference or bang-name production rules.

All **f** elements of **CT_Cell** elements, as specified in [ISO/IEC29500-4:2016] section A.2, and all **calculatedColumnFormula** and **totalsRowFormula** elements of **CT_TableColumn** elements, as specified in [ISO/IEC29500-4:2016] section A.2, are cell formulas.

2.2.2.2 Conditional Formatting Formulas

A **conditional formatting** formula is a **formula** that adheres to the grammar specified in section 2.2.2, with the following restrictions:

▪ The formula MUST NOT use the union-operator, intersection-operator, range-operator, bang-reference, bang-name, array-constant, external-cell-reference, or structure-reference production rules.

All **val attributes** of **CT_Cfvo** elements, as specified in [ISO/IEC29500-4:2016] section A.2, and all **formula** elements of **CT_CfRule** elements, as specified in [ISO/IEC29500-4:2016] section A.2, are conditional formatting formulas.

2.2.2.3 Data Validation Formulas

A **data validation** formula is a **formula** that adheres to the grammar specified in section 2.2.2, with the following restrictions:

▪ The formula MUST NOT use the union-operator, intersection-operator, range-operator, bang-reference, bang-name, array-constant, sheet-range-reference, or structure-reference production rules.

All **formula1** and **formula2** elements of **CT_DataValidation** elements, as specified in [ISO/IEC29500-4:2016] section A.2, are data validation formulas.

2.2.2.4 External Name Formulas

An external name formula is a **formula** that adheres to the following grammar:

```
external-name-formula = ref-constant / sheet-range-reference / single-sheet-reference
```

When matching the single-sheet or sheet-range rules for an external name formula, the optional workbook-index in those rules MUST NOT be omitted.

All **refersTo** attributes of **CT_ExternalDefinedName** elements, as specified in [ISO/IEC29500-4:2016] section A.2, are external name formulas.

2.2.2.5 Name Formulas

A name formula is a **formula** that adheres to the grammar specified in section 2.2.2, with the following differences.

For name formulas, the function-call rule is expanded as follows:

```
function-call =/ (macro-function-call / command-function-call)
```

The formula MUST NOT use the local-cell-reference production rule.

All **formula** and **oldFormula** elements of **CT_RevisionDefinedName** elements, as specified in [ISO/IEC29500-4:2016] section A.2, and all **definedName** elements of **CT_DefinedNames** elements, as specified in [ISO/IEC29500-4:2016] section A.2, are name formulas.

2.2.2.6 Pivot Field Formulas

A pivot **field formula** is a formula that adheres to the grammar specified in section 2.2.2, with the following differences.

For pivot field formulas, the nospace-expression rule is expanded as follows:

```
nospace-expression =/ pivot-field-name
pivot-field-name = name / apostrophe 1*pivot-field-string-character apostrophe
pivot-field-string-character = apostrophe apostrophe / pivot-field-character
pivot-field-character = character ; MUST NOT be apostrophe
```

The formula MUST NOT use the ref-infix-operator, array-constant, getpivotdata-params, dcount-params, dcounta-params, dsum-params, daverage-params, dmin-params, dmax-params, dproduct-params, dstdev-params, dstdevp-params, dvar-params, dvarp-params, index-params, rand-params, now-params, areas-params, rows-params, columns-params, offset-params, cell-params, index-params, today-params, info-params, or randbetween-params production rules.

A name used in a pivot field formula MUST NOT have any of the following forms:

- All

- Blank

All **formula** attributes of **CT_CacheField** elements, as specified in [ISO/IEC29500-4:2016] section A.2, are pivot field formulas.

2.2.2.7 Pivot Item Formulas

A pivot item formula is a **formula** that adheres to the grammar specified in section 2.2.2, with the following differences.

For pivot item formulas, the nospace-expression rule is expanded as follows:

```
nospace-expression =/ pivot-items
pivot-items = pivot-item space *(*whitespace pivot-item)
pivot-item = pivot-field-name / pivot-field-name "[" pivot-item-value "]"
pivot-item-value = pivot-field-name / [sign] whole-number-part
```

The formula MUST NOT use the ref-infix-operator, array-constant, getpivotdata-params, dcount-params, dcounta-params, dsum-params, daverage-params, dmin-params, dmax-params, dproduct-

params, dstdev-params, dstdevp-params, dvar-params, dvarp-params, index-params, rand-params, now-params, areas-params, rows-params, columns-params, offset-params, cell-params, index-params, today-params, info-params, or randbetween-params production rules.

A name used in a pivot item formula MUST NOT have any of the following forms:

- All

- Blank

All **formula** attributes of **CT_CalculatedItem** elements, as specified in [ISO/IEC29500-4:2016] section A.2, are pivot item formulas.

2.2.3 Functions

The predefined functions ([ISO/IEC29500-1:2016] section 18.17.7) are extended by the following **future functions**.

Future function
_xlfn.ACOT
_xlfn.ACOTH
_xlfn.AGGREGATE
_xlfn.ARABIC
_xlfn.BASE
_xlfn.BETA.DIST
_xlfn.BETA.INV
_xlfn.BINOM.DIST
_xlfn.BINOM.DIST.RANGE
_xlfn.BINOM.INV
_xlfn.BITAND
_xlfn.BITLSHIFT
_xlfn.BITOR
_xlfn.BITRSHIFT
_xlfn.BITXOR
_xlfn.CEILING.MATH
_xlfn.CEILING.PRECISE
_xlfn.CHISQ.DIST
_xlfn.CHISQ.DIST.RT
_xlfn.CHISQ.INV
_xlfn.CHISQ.INV.RT
_xlfn.CHISQ.TEST

Future function
_xlfn.COMBINA
_xlfn.CONCAT
_xlfn.CONFIDENCE.NORM
_xlfn.CONFIDENCE.T
_xlfn.COT
_xlfn.COTH
_xlfn.COVARIANCE.P
_xlfn.COVARIANCE.S
_xlfn.CSC
_xlfn.CSCH
_xlfn.DAYS
_xlfn.DECIMAL
ECMA.CEILING
_xlfn.ERF.PRECISE
_xlfn.ERFC.PRECISE
_xlfn.EXPON.DIST
_xlfn.F.DIST
_xlfn.F.DIST.RT
_xlfn.F.INV
_xlfn.F.INV.RT
_xlfn.F.TEST
_xlfn.FIELDVALUE
_xlfn.FILTERXML
_xlfn.FLOOR.MATH
_xlfn.FLOOR.PRECISE
_xlfn.FORECAST.ETS
_xlfn.FORECAST.ETS.CONFINT
_xlfn.FORECAST.ETS.SEASONALITY
_xlfn.FORECAST.ETS.STAT
_xlfn.FORECAST.LINEAR
_xlfn.FORMULATEXT
_xlfn.GAMMA

Future function
_xlfn.GAMMA.DIST
_xlfn.GAMMA.INV
_xlfn.GAMMALN.PRECISE
_xlfn.GAUSS
_xlfn.HYPGEOM.DIST
_xlfn.IFNA
_xlfn.IFS
_xlfn.IMCOSH
_xlfn.IMCOT
_xlfn.IMCSC
_xlfn.IMCSCH
_xlfn.IMSEC
_xlfn.IMSECH
_xlfn.IMSINH
_xlfn.IMTAN
_xlfn.ISFORMULA
ISO.CEILING
_xlfn.ISOWEEKNUM
_xlfn.LET
_xlfn.LOGNORM.DIST
_xlfn.LOGNORM.INV
_xlfn.MAXIFS
_xlfn.MINIFS
_xlfn.MODE.MULT
_xlfn.MODE.SNGL
_xlfn.MUNIT
_xlfn.NEGBINOM.DIST
NETWORKDAYS.INTL
_xlfn.NORM.DIST
_xlfn.NORM.INV
_xlfn.NORM.S.DIST
_xlfn.NORM.S.INV

Future function
_xlfn.NUMBERVALUE
_xlfn.PDURATION
_xlfn.PERCENTILE.EXC
_xlfn.PERCENTILE.INC
_xlfn.PERCENTRANK.EXC
_xlfn.PERCENTRANK.INC
_xlfn.PERMUTATIONA
_xlfn.PHI
_xlfn.POISSON.DIST
_xlfn.QUARTILE.EXC
_xlfn.QUARTILE.INC
_xlfn.QUERYSTRING
_xlfn.RANDARRAY
_xlfn.RANK.AVG
_xlfn.RANK.EQ
_xlfn.RRI
_xlfn.SEC
_xlfn.SECH
_xlfn.SEQUENCE
_xlfn.SHEET
_xlfn.SHEETS
_xlfn.SKEW.P
_xlfn.SORTBY
_xlfn.STDEV.P
_xlfn.STDEV.S
_xlfn.SWITCH
_xlfn.T.DIST
_xlfn.T.DIST.2T
_xlfn.T.DIST.RT
_xlfn.T.INV
_xlfn.T.INV.2T
_xlfn.T.TEST

Future function
_xlfn.TEXTJOIN
_xlfn.UNICHAR
_xlfn.UNICODE
_xlfn.UNIQUE
_xlfn.VAR.P
_xlfn.VAR.S
_xlfn.WEBSERVICE
_xlfn.WEIBULL.DIST
WORKDAY.INTL
_xlfn.XLOOKUP
_xlfn.XOR
_xlfn.Z.TEST

The function syntax ([ISO/IEC29500-1:2016] section 18.17.2.4) is extended by changing the function-name rule to:

```
function-name =
    prefixed-function-name |
    predefined-function-name |
    user-defined-function-name |
    future-function-list;
```

The future-function-list rule is found in the Formulas grammar.

2.2.4 Extensions by Part

This section specifies the elements from Office Open XML file formats as specified in [ISO/IEC29500-1:2016] that are extended by this format. Either the **Ignorable** attribute ([ISO/IEC29500-3:2015] section 10.1.1), **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1), or the **extLst** element ([ISO/IEC29500-1:2016] section 18.2.10) MUST be used to maintain compatibility with Office Open XML file formats implementations as specified in [ISO/IEC29500-1:2016].

2.2.4.1 Connections

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **connection** element ([ISO/IEC29500-1:2016] section 18.13.1) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{D79990A0-CA42-45E3-83F4-45C500A0EAA5}	**connection**
{DE250136-89BD-433C-8126-D09CA5730AF9}	**connection**

See [ISO/IEC29500-3:2015] section 10.1.2 for more details about how extension lists are used.

2.2.4.2 Drawing

The **oneCellAnchor** element ([ISO/IEC29500-1:2016] section 20.5.2.24) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/drawingml/2010/slicer	**slicer**
Fallback	**sp** ([ISO/IEC29500-1:2016] section 20.5.2.29)

The **twoCellAnchor** element ([ISO/IEC29500-1:2016] section 20.5.2.33) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/drawingml/2010/slicer	**slicer**
Fallback	**sp** ([ISO/IEC29500-1:2016] section 20.5.2.29)

The **grpSp** element ([ISO/IEC29500-1:2016] section 20.5.2.17) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/drawingml/2010/slicer	**slicer**
Fallback	**sp** ([ISO/IEC29500-1:2016] section 20.5.2.29)

The **absoluteAnchor** element ([ISO/IEC29500-1:2016] section 20.5.2.1) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/drawingml/2010/slicer	**slicer**
Fallback	**sp** ([ISO/IEC29500-1:2016] section 20.5.2.29)

2.2.4.3 External Workbook References

The **oleItems** element ([ISO/IEC29500-1:2016] section 18.14.10) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**oleItem**
Fallback	**oleItem** ([ISO/IEC29500-1:2016] section 18.14.9)

2.2.4.4 Metadata

The **extLst** child element ([ISO/IEC29500-1:2016] section A.2) of the **futureMetadata** element ([ISO/IEC29500-1:2016] section 18.9.4) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section A.2) whose structure is specified in the following table. All **futureMetadata** elements are also linked to a **metadataType** ([ISO/IEC29500-1:2016] section 18.9.10) by the **name** attribute.

Ext URI	name attribute	Child element
{3E2802C4-A4D2-4D8B-9148-E3BE6C30E623}	"XLRICHVALUE"	**rvb**
{BDBB8CDC-FA1E-496E-A857-3C3F30C029C3}	"XLDAPR"	**dynamicArrayProperties**

2.2.4.5 Pivot Table

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **pivotTableDefinition** element ([ISO/IEC29500-1:2016] section 18.10.1.73) is extended by the addition of new child **ext** elements ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{962EF5D1-5CA2-4C93-8EF4-DBF5C05439D2}	**pivotTableDefinition**
{44433962-1CF7-4059-B4EE-95C3D5FFCF73}	**pivotTableData**
{C510F80B-63DE-4267-81D5-13C33094786E}	**pivotTableServerFormats**
{E67621CE-5B39-4880-91FE-76760E9C1902}	**pivotTableUISettings**
{747A6164-185A-40DC-8AA5-F01512510D54}	**pivotTableDefinition16**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **pivotField** element ([ISO/IEC29500-1:2016] section 18.10.1.69) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{2946ED86-A175-432A-8AC1-64E0C546D7DE}	**pivotField**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **dataField** element ([ISO/IEC29500-1:2016] section 18.10.1.22) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{E15A36E0-9728-4E99-A89B-3F7291B0FE68}	**dataField**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **pivotHierarchy** element ([ISO/IEC29500-1:2016] section 18.10.1.72) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{F1805F06-0CD304483-9156-8803C3D141DF}	**pivotHierarchy**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**iconFilter**
Fallback	**customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3)

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**customFilters**
Fallback	Either **customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3) or none

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**filter**
Fallback	**customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3)

The **filters** element ([ISO/IEC29500-1:2016] section 18.3.2.8) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**filter**
Fallback	Either **filter** ([ISO/IEC29500-1:2016] section 18.3.2.6) or none

The **sortState** element ([ISO/IEC29500-1:2016] section 18.3.1.92) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**sortCondition**
Fallback	**sortCondition** ([ISO/IEC29500-1:2016] section 18.3.1.91)

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **filter** element ([ISO/IEC29500-1:2016] section 18.10.1.33) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{0605FD5F-26C8-4aeb-8148-2DB25E43C511}	**pivotFilter**

2.2.4.6 Pivot Table Cache Definition

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **pivotCacheDefinition** element ([ISO/IEC29500-1:2016] section 18.10.1.67) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{725AE2AE-9491-48BE-B2B4-4EB974FC3084}	**pivotCacheDefinition**
{5DA0FC9A-693D-419c-AD59-312A39285967}	**timelinePivotCacheDefinition**
{ABF5C744-AB39-4b91-8756-CFA1BBC848D5}	**pivotCacheIdVersion**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **cacheField** element ([ISO/IEC29500-1:2016] section 18.10.1.3) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{63CAB8AC-B538-458D-9797-405883B0398D}	**cacheField**
{4F2E5C28-24EA-4EB8-9CBF-B6C8F9C3D259}	**cachedUniqueNames**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **cacheHierarchy** element ([ISO/IEC29500-1:2016] section 18.10.1.6) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{8CF416AD-EC4C-4ABA-99F5-12A058AE0983}	**cacheHierarchy**
{B97F6D7D-B522-45F9-BDA1-12C45D357490}	**cacheHierarchy**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **calculatedMember** element ([ISO/IEC29500-1:2016] section 18.10.1.10) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{0C70D0D5-359C-4A49-802D-23BBF952B5CE}	**calculatedMember**
{57DEB092-E4DC-418E-9C9A-C0C97F8552CB}	**calculatedMember**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **cacheSource** element ([ISO/IEC29500-1:2016] section 18.10.1.7) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{F057638F-6D5F-4E77-A914-E7F072B9BCA8}	**sourceConnection**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

2.2.4.7 Query Table

The **sortState** element ([ISO/IEC29500-1:2016] section 18.3.1.92) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**sortCondition**
Fallback	**sortCondition** ([ISO/IEC29500-1:2016] section 18.3.1.91)

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **queryTable** element ([ISO/IEC29500-1:2016] section 18.12.2) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{883FBD77-0823-4A55-B5E3-86C4891E6966}	**queryTable**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

2.2.4.8 SlicerCache

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **slicerCacheDefinition** element (section 2.4.38) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{03082B11-2C62-411c-B77F-237D8FCFBE4C}	**slicerCachePivotTables**
{2F2917AC-EB37-4324-AD4E-5DD8C200BD13}	**tableSlicerCache**
{470722E0-AACD-4C17-9CDC-17EF765DBC7E}	**slicerCacheHideItemsWithNoData**

2.2.4.9 Styles

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **styleSheet** element ([ISO/IEC29500-1:2016] section 18.8.39) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{EB79DEF2-80B8-43E5-95BD-54CBDDF9020C}	**slicerStyles**
{46F421CA-312F-682F-3DD2-61675219B42D}	**dxfs**
{9260A510-F301-46a8-8635-F512D64BE5F5}	**timelineStyles**
{A0A4C193-F2C1-4fcb-8827-314CF55A85BB}	**dxfs**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used. The **font** element ([ISO/IEC29500-1:2016] section 18.8.22) is extended by the addition of a **knownFonts** attribute. To maintain compatibility with implementations of Office Open XML file formats as specified in [ISO/IEC29500-1:2016], the namespace prefix of the attribute MUST be specified as an **Ignorable** attribute ([ISO/IEC29500-3:2015] section 10.1.1).

2.2.4.10   Table Definition

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **table** element ([ISO/IEC29500-1:2016] section 18.5.1.2) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{504A1906-F514-4F6F-8877-14C23A59335A}	**table**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**iconFilter**
Fallback	**customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3)

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**customFilters**
Fallback	Either **customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3) or none

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**filters**

AlternateContent components	Child element
	([ISO/IEC29500-1:2016] section 18.3.2.8) such that instead of any child **filter** ([ISO/IEC29500-1:2016] section 18.3.2.6) elements, there are **filter** elements
Fallback	**customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3)

The **filters** element ([ISO/IEC29500-1:2016] section 18.3.2.8) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**filter**
Fallback	Either **filter** ([ISO/IEC29500-1:2016] section 18.3.2.6) or none

The **sortState** element ([ISO/IEC29500-1:2016] section 18.3.1.92) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**sortCondition**
Fallback	**sortCondition** ([ISO/IEC29500-1:2016] section 18.3.1.91)

2.2.4.11 Workbook

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **workbook** element ([ISO/IEC29500-1:2016] section 18.2.27) is extended by the addition of new child **ext** elements ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{876F7934-8845-4945-9796-88D515C7AA90}	**pivotCaches**
{BBE1A952-AA13-448E-AADC-164F8A28A991}	**slicerCaches**
{79F54976-1DA5-4618-B147-ACDE4B953A38}	**workbookPr**
{841E416B-1EF1-43b6-AB56-02D37102CBD5}	**pivotCaches**
{983426D0-5260-488c-9760-48F4B6AC55F4}	**pivotTableReferences**
{A2CB5862-8E78-49c6-8D9D-AF26E26ADB89}	**timelineCachePivotCaches**
{D0CA8CA8-9F24-4464-BF8E-62219DCF47F9}	**timelineCacheRefs**
{140A7094-0E35-4892-8432-C4D2E57EDEB5}	**workbookPr**
{FCE2AD5D-F65C-4FA6-A056-5C36A1767C68}	**dataModel**
{B58B0392-4F1F-4190-BB64-5DF3571DCE5F}	**calcFeatures**
{FCE6A71B-6B00-49CD-AB44-F6B1AE7CDE65}	externalLinkPr

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **dataModel** element (section 2.4.62) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{9835A34E-60A6-4A7C-AAB8-D5F71C897F49}	**ModelTimeGroupings**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

2.2.4.12 Worksheet

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **worksheet** element ([ISO/IEC29500-1:2016] section 18.3.1.99) is extended by the addition of new child **ext** elements ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{78C0D931-6437-407D-A8EE-F0AAD7539E65}	**conditionalFormattings**
{CCE6A557-97BC-4B89-ADB6-D9C93CAAB3DF}	**dataValidations**
{05C60535-1F16-4FD2-B633-F4F36F0B64E0}	**sparklineGroups**
{A8765BA9-456A-4DAB-B4F3-ACF838C121DE}	**slicerList**
{FC87AEE6-9EDD-4A0A-B7FB-166176984837}	**protectedRanges**
{01252117-D84E-4E92-8308-4BE1C098FCBB}	**ignoredErrors**
{F7C9EE02-42E1-4005-9D12-6889AFFD525C}	**webExtensions**
{7E03D99C-DC04-49d9-9315-930204A7B6E9}	**timelineRefs**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The **extLst** child element ([ISO/IEC29500-1:2016] section 18.2.10) of the **cfRule** element ([ISO/IEC29500-1:2016] section 18.3.1.10) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{B025F937-C7B1-47D3-B67F-A62EFF666E3E}	**id**

See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.
The **sheetFormatPr** element ([ISO/IEC29500-1:2016] section 18.3.1.81) is extended by the addition of a **dyDescent** attribute. To maintain compatibility with Office Open XML file formats implementations as specified in [ISO/IEC29500-1:2016], the namespace prefix of the attribute MUST be specified as an **Ignorable** attribute ([ISO/IEC29500-3:2015] section 10.1.1).
The **row** element ([ISO/IEC29500-1:2016] section 18.3.1.73) is extended by the addition of a **dyDescent** attribute. To maintain compatibility with Office Open XML file formats implementations as specified in [ISO/IEC29500-1:2016], the namespace prefix of the attribute MUST be specified as an **Ignorable** attribute ([ISO/IEC29500-3:2015] section 10.1.1).

The **sortState** element ([ISO/IEC29500-1:2016] section 18.3.1.92) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**sortCondition**
Fallback	**sortCondition** ([ISO/IEC29500-1:2016] section 18.3.1.91)

The **sortState** element ([ISO/IEC29500-1:2016] section 18.3.1.92) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{0FC57C36-975A-43D2-8416-536B9B585D1B}	**richSortCondition**

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**iconFilter**
Fallback	**customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3)

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**customFilters**
Fallback	Either **customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3) or none

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**filters** ([ISO/IEC29500-1:2016] section 18.3.2.8) such that instead of child **filter** ([ISO/IEC29500-1:2016] section 18.3.2.6) elements, there are **filter** elements
Fallback	**customFilters** ([ISO/IEC29500-1:2016] section 18.3.2.3)

The **filterColumn** element ([ISO/IEC29500-1:2016] section 18.3.2.7) is extended by the addition of a new child **ext** element ([ISO/IEC29500-1:2016] section 18.2.7) whose structure is specified in the following table.

Ext URI	Child element
{68452572-C921-441B-96FD-77FB3E787301}	**filterColumn**

The **filters** element ([ISO/IEC29500-1:2016] section 18.3.2.8) is extended by the addition of a child **AlternateContent** element ([ISO/IEC29500-3:2015] section 10.2.1) whose structure is specified in the following table.

AlternateContent components	Child element
Choice: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main	**filter**
Fallback	Either **filter** ([ISO/IEC29500-1:2016] section 18.3.2.6) or none

2.3   Conceptual Overview

This section specifies how higher-level features of the file format are represented by combinations of low-level structures.

2.3.1   PivotTable What-if Analysis

PivotTable what-if analysis enables the editing of summarized values in an **OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) view, for example, editing summarized values in the PivotTable data area of the PivotTable view.

A **CT_PivotEdits** element, as specified in section 2.6.37, and its child **CT_PivotEdit** elements, as specified in section 2.6.38, specify the values in the OLAP PivotTable view that have been modified and the corresponding values in the OLAP PivotTable **source data**. The **CT_PivotUserEdit** child element, as specified in section 2.6.41, of the **CT_PivotEdit** element specifies a value or a **formula**. The location of the modified value in the OLAP PivotTable view is specified by a PivotTable rule specified by the **CT_PivotArea** element ([ISO/IEC29500-4:2016] section A.2) in this **CT_PivotEdit** element. The **OLAP tuple** that identifies the corresponding value in the OLAP PivotTable source data is specified by the **CT_TupleItems** element, as specified in section 2.6.43, in this **CT_PivotEdit** element.

A **CT_PivotChanges** element, as specified in section 2.6.39, and its child **CT_PivotChange** elements, as specified in section 2.6.40, specify the values in the OLAP PivotTable view that have been designated for **OLAP allocation** and the corresponding values in the OLAP PivotTable source data. The order of the **CT_PivotChange** elements determines the order in which they are designated for OLAP allocation. The **CT_PivotChange** element specifies a single edited value designated for OLAP allocation. An OLAP allocation value is specified by the **CT_PivotEditValue** child element, as specified in section 2.6.42, of the **CT_PivotChange** element. The **allocationMethod** attribute of the **CT_PivotChange** element specifies the OLAP allocation method. The OLAP tuple that identifies the location of the edited value in the OLAP PivotTable view and the corresponding value in the OLAP PivotTable source data is specified by the **CT_TupleItems** child element of the **CT_PivotChange** element.

For example, when an OLAP PivotTable is refreshed, the values designated for OLAP allocation, specified by the **CT_PivotChanges** element and its child **CT_PivotChange** elements, are sent to the OLAP **data provider** along with the OLAP allocation method indicating how to allocate the updated values. The OLAP data provider updates the values, and those new values are then refreshed and summarized in the data area of the PivotTable view, instead of summarizing the original values from the OLAP PivotTable source data.

If the **enableEdit** attribute of the **CT_PivotTableDefinition** element, as specified in section 2.6.32, is "false", **CT_PivotEdits** and **CT_PivotChanges** elements MUST NOT exist in this part. PivotTable what-if analysis is enabled if, and only if, the **enableEdit** attribute of the **CT_PivotTableDefinition** element is "true" and the PivotTable source data is OLAP.

2.3.2 Slicers

A slicer is a mechanism for filtering data in PivotTable ([ISO/IEC29500-1:2016] section 18.10) views, **cube functions**, **tables** ([ISO/IEC29500-1:2016] section 18.5.1.2) and Charts ([ISO/IEC29500-1:2016] section 21.2) based on Non-Worksheet PivotTables. A slicer is based on a **field** in the slicer source data, and the slicer filters on distinct values in that **column**. In the case of using **OLAP** slicer source data, a slicer is based on an **OLAP hierarchy**.

A slicer has two major parts, a slicer cache and a slicer view. There can be more than one slicer view based on a single slicer cache. When filtering multi-level OLAP hierarchies using slicers, separate slicer views are used for each **OLAP level**.

2.3.2.1 Slicer Cache

A slicer cache specifies the subset of slicer source data that is cached for display in slicer views, as well as properties related to slicer filtering. A slicer cache is specified by the **CT_SlicerCacheDefinition** element.

A slicer cache has an associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache as specified in section 2.3.2.1.2, or **Table** ([ISO/IEC29500-1:2016] section 18.5.1.2).

If the slicer source data is an **OLAP data source**, the **sourceName** attribute of the **CT_SlicerCacheDefinition** element specifies the **MDX unique name** of the associated **OLAP hierarchy**.

If the slicer source data is a non-OLAP data source, the **sourceName** attribute of the **CT_SlicerCacheDefinition** element specifies the associated PivotTable cache **field** of the associated PivotTable **PivotCache**.

If the slicer source data is a table data source, the **sourceName** attribute of the **CT_SlicerCacheDefinition** element specifies the associated **table** field.

If the slicer is used to **filter** PivotTable views, the slicer cache specifies the PivotTable views being filtered as specified in section 2.3.2.1.4.

2.3.2.1.1 Slicer Source Data

The **source data** for a slicer is specified by the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache as specified in Slicer Cache Relationship to PivotCache, or **Table** ([ISO/IEC29500-1:2016] section 18.5.1.2) as specified in Slicer Cache Relationship to Table.

2.3.2.1.2 Slicer Cache Relationship to PivotCache

A slicer cache can be associated with a PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache. The association is specified by the following rules:

- If the **CT_SlicerCacheDefinition** element has a child **CT_SlicerCacheData** element with a child **CT_OlapSlicerCache** element, then the type of slicer source data is **OLAP** and the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache of the slicer cache is specified by the **pivotCacheId** attribute of the CT_OlapSlicerCache element. The associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache MUST be based on an OLAP connection ([ISO/IEC29500-1:2016] section 18.13.5). The **slicerData** attribute of the **CT_PivotCacheDefinition** element MUST be "true".

- If the **CT_SlicerCacheDefinition** element has a child **CT_SlicerCacheData** element with a child **CT_TabularSlicerCache** element, the type of slicer source data is non-OLAP and the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache of the slicer cache is specified by the **pivotCacheId** attribute of the **CT_TabularSlicerCache** element. The associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache MUST be based on a non-OLAP connection

([ISO/IEC29500-1:2016] section 18.13). The **slicerData** attribute of the **CT_PivotCacheDefinition** element MUST be "false".

Multiple slicer caches can be associated with one PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache.

If a slicer cache is associated, as specified by Slicer Cache Relationship to PivotTable View, with one or more PivotTable ([ISO/IEC29500-1:2016] section 18.10) views, and the slicer source data type is non-OLAP, the slicer cache and each associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) view MUST be associated with the same PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache and the **slicerData** attribute of the CT_PivotCacheDefinition element MUST be "false".

If a slicer cache is associated, as specified by Slicer Cache Relationship to PivotTable View, with one or more PivotTable ([ISO/IEC29500-1:2016] section 18.10) views, and the slicer source data type is OLAP, the PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache that is associated with the slicer cache and all PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCaches that are associated with the PivotTable ([ISO/IEC29500-1:2016] section 18.10) views MUST be based on the same OLAP connection ([ISO/IEC29500-1:2016] section 18.13.5) and the PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCaches associated with the PivotTable ([ISO/IEC29500-1:2016] section 18.10) views MUST NOT be associated with any slicer cache. The **slicerData** attribute of the **CT_PivotCacheDefinition** element for each PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache associated with the PivotTable ([ISO/IEC29500-1:2016] section 18.10) views MUST be "false".

2.3.2.1.3 Slicer Cache Relationship to Table

A slicer cache can be associated with a **Table** ([ISO/IEC29500-1:2016] section 18.5.1.2). The association is specified by the following rule:

- If the **CT_SlicerCacheDefinition** element has a child **extLst** element with a child **CT_TableSlicerCache** element, the type of slicer source data is table and the associated **Table** ([ISO/IEC29500-1:2016] section 18.5.1.2) of the slicer cache is specified by the **tableId** attribute of the **CT_TableSlicerCache** element.

Multiple slicer caches can be associated with one **Table** ([ISO/IEC29500-1:2016] section 18.5.1.2).

2.3.2.1.4 Slicer Cache Relationship to PivotTable View

A slicer cache, as specified in section 2.3.2.1, can be associated with PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, views and Charts ([ISO/IEC29500-1:2016] section 21.2) based on Non-Worksheet PivotTables, by the **pivotTables** group element of the **CT_SlicerCacheDefinition** element, as specified in section 2.6.70.

If the associated PivotTable **PivotCache** of a slicer cache, as specified by the Slicer Cache Relationship to PivotCache, is an **OLAP** PivotTable **PivotCache**, the slicer items, as specified in section 2.3.2.1.6, in the slicer cache are used to apply PivotTable OLAP manual filters to the PivotTable **hierarchy** specified by the **sourceName** attribute of the **CT_SlicerCacheDefinition** element in all associated PivotTable views and Charts based on Non-Worksheet PivotTables, of the slicer cache. The **selected** slicer items in the slicer cache are converted into selected PivotTable items in the PivotTable OLAP manual filters by the application to apply the filter state of the slicer cache to the associated PivotTable views.

If the associated PivotTable **PivotCache** of a slicer cache, as specified by Slicer Cache Relationship to PivotCache, is a non-OLAP PivotTable **PivotCache**, the PivotTable **PivotCache** of the PivotTable views and the PivotTable **PivotCache** of the slicer cache MUST be the same.

When an OLAP PivotTable view is associated with an OLAP slicer cache, there MUST NOT be more than one slicer cache for each **OLAP hierarchy**. If the slicer cache is associated with at least one Chart based on Non-Worksheet PivotTable then the slicer cache MUST be OLAP sourced.

If the associated PivotTable **PivotCache** of a slicer cache, as specified by Slicer Cache Relationship to PivotCache, is a non-OLAP PivotTable **PivotCache**, the slicer items in the slicer cache are used to apply PivotTable non-OLAP manual filters to the **PivotTable field** specified by the **sourceName** attribute of the **CT_SlicerCacheDefinition** element in all associated PivotTable views of the slicer cache. The selected slicer items in the slicer cache are converted into selected PivotTable items in the PivotTable non-OLAP manual filters by the application to apply the filter state of the slicer cache to the associated PivotTable views. See the PivotTable items in [ISO/IEC29500-1:2016] section 18.10 for more details.

2.3.2.1.5 Slicer Cache Relationship to Table column

A slicer cache, as specified in section 2.3.2.1, can be associated with **column** in a **Table**, as specified in [ISO/IEC29500-1:2016] section 18.5.1.2. Associated column is specified by the **column** attribute of the **CT_TableSlicerCache** element.

2.3.2.1.6 Slicer Items

Slicer items in a slicer cache represent distinct values in a **column** of the slicer source data. In the case of slicers based on **OLAP** slicer source data, the slicer cache is based on an **OLAP hierarchy** and slicer items represent **OLAP members** within levels of that OLAP hierarchy.

For slicers associated with PivotTable ([ISO/IEC29500-1:2016] section 18.10) views, each slicer item specifies whether slicer source data exists for that slicer item. For more information, see Slicer Cross Filtering.

Each slicer item also specifies the item selection state, used for filtering, and can specify additional properties. For more information see Non-OLAP Slicer Items and OLAP Slicer Items.

2.3.2.1.6.1   Non-OLAP Slicer Items

The slicer items of a non–**OLAP** slicer are specified by an ordered sequence of CT_TabularSlicerCacheItem elements. Each slicer item is associated with a PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item of the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache **field** in the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache. For more information, see Slicer Cache Relationship to PivotCache.

The associated cache field is specified by the **sourceName** attribute of the **CT_SlicerCacheDefinition** element and MUST be equal to the **name** attribute of a **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) element in the collection of PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache fields ([ISO/IEC29500-4:2016] section A.2) of the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache. The associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item is specified by the **x** attribute of the **CT_TabularSlicerCacheItem** element, which contains a PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item index of the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item in the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache field. Two non–OLAP slicer items MUST NOT be associated with the same PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item.

The order of non–OLAP slicer items in the slicer cache is specified by the **sortOrder**, **crossFilter**, and **customListSort** attributes of the **CT_TabularSlicerCache** element.

The **CT_TabularSlicerCacheItem** element also specifies whether the non–OLAP slicer item is selected for filtering and whether data exists in the slicer source data for it. For more information, see Slicer Cross Filtering.

2.3.2.1.6.2   OLAP Slicer Items

A **CT_OlapSlicerCache** element specifies properties of an **OLAP** slicer cache, and its **descendant** elements specify OLAP slicer items.

A **CT_OlapSlicerCacheRanges** element specifies the cache for an **OLAP level** in an OLAP slicer cache.

The cache is organized into **ranges** of cached OLAP slicer items for each OLAP level in the slicer cache. Each range is specified in a **CT_OlapSlicerCacheRange** element. The **startItem** attribute of the **CT_OlapSlicerCacheRange** element specifies the zero-based index of the first OLAP slicer item in this cached range in the ordered collection of all **OLAP members** that exist in the slicer source data for the associated OLAP level. The collection in the slicer source data is ordered as specified by the **sortOrder** and **crossFilter** attributes of the earlier **CT_OlapSlicerCacheLevelData** element.

Each cached OLAP slicer item in a range is specified by a **CT_OlapSlicerCacheItem** element.

The OLAP slicer items that are selected for filtering are specified by the **CT_OlapSlicerCacheSelections** element.

Each individual OLAP slicer item selected for filtering is specified by a **CT_OlapSlicerCacheSelection** element.

2.3.2.1.7 Slicer Cross Filtering

Cross filtering is an application behavior that allows one slicer to reflect the results of filtering by another. This behavior exposes whether data exists in the slicer source data for each slicer item when the slicer source data is filtered by the selected slicer items of all associated slicer caches of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) view, as specified by Slicer Cache Relationship to PivotTable View, and all PivotTable ([ISO/IEC29500-1:2016] section 18.10) manual filters in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view.

If the type of slicer source data is **OLAP**, the existence of data, after filtering, for a slicer item is specified by the **nd** attribute of the **CT_OlapSlicerCacheItem** element. If the type of slicer source data is non-OLAP, the existence of data for a slicer item is specified by the **nd** attribute of the **CT_TabularSlicerCacheItem** element.

If the type of slicer source data is non-OLAP, the **crossFilter** attribute of the **CT_TabularSlicerCache** element specifies how the non-OLAP slicer items that have no data appear.

If the type of slicer source data is OLAP, the **crossFilter** attribute of the **CT_OlapSlicerCacheLevelData** element specifies how the OLAP slicer items that have no data are displayed for the **OLAP level** specified by the **uniqueName** attribute of the **CT_OlapSlicerCacheLevelData** element.

2.3.2.2 Slicer View

A slicer view specifies the display of a slicer on a **worksheet**. A slicer view is displayed as a list of slicer items. The slicer view is specified by a **CT_Slicer** element.

Each slicer view is associated with a slicer cache as specified in Slicer View Relationship to Slicer Cache. The filtering state of slicer items displayed in the slicer view is specified by the associated slicer cache.

Each slicer view is associated with a drawing ([ISO/IEC29500-1:2016] section 20.5), contained in the Drawings part ([ISO/IEC29500-1:2016] section 12.3.8). The associated drawing ([ISO/IEC29500-1:2016] section 20.5) contains a **CT_Slicer** element that has a **name** attribute that matches the **name** attribute of the **CT_Slicer** element that specifies the slicer view.

2.3.2.2.1 Slicer View Relationship to Slicer Cache

Each slicer view is associated with a slicer cache. The slicer view is associated with a slicer cache through the **name** attribute of the **CT_SlicerCacheDefinition** element in the slicer cache that matches the **cache** attribute of the **CT_Slicer** element that specifies this slicer view.

If a slicer view is associated with an **OLAP** slicer cache, the slicer view also has an associated **OLAP level**, specified by the **level** attribute of the **CT_Slicer** element. In this case, the slicer view displays OLAP Slicer Items of that OLAP level.

There can be multiple slicer views associated with a single slicer cache. There are two main reasons for this:

▪ For a user-defined **OLAP hierarchy** with several OLAP levels—for example, a Geography OLAP hierarchy with Country, State, and City OLAP levels —each slicer view is associated with a single OLAP level, providing a mechanism for filtering different OLAP levels of the OLAP hierarchy.

▪ Multiple slicer views associated with either the same slicer cache (for a non-OLAP slicer cache) or the same OLAP level (for an OLAP slicer cache) provide a mechanism for displaying the filter state in more than one location in the workbook.

2.3.2.3 Slicers and Cube Functions

Each slicer cache has a **defined name** associated with it as specified by the **name** attribute of the **CT_SlicerCacheDefinition** element.

The value of the **CT_DefinedName** ([ISO/IEC29500-1:2016] section 18.2.5) element specifying a defined name associated with a slicer cache MUST be #N/A.

If the slicer source data type of a slicer cache is **OLAP**, **cube functions** can use the defined name of the slicer cache as a parameter to refer to the selection state of the slicer cache.

2.3.2.4 Slicer Styles

Slicer styles specify the formatting to apply to visual components of slicer views. The **style** attribute of the **CT_Slicer** element specifies the slicer style to be applied. A slicer style can be either built-in or user-defined. Built-in slicer styles are specified in the **CT_Slicer** element. User-defined slicer styles are specified in the **CT_SlicerStyles** element.

A slicer style is an extension of a table style ([ISO/IEC29500-1:2016] section 18.8) with additional table style ([ISO/IEC29500-1:2016] section 18.8) elements specific to the formatting of slicer views. A user-defined slicer style is specified by a **CT_SlicerStyle** element and the table style ([ISO/IEC29500-1:2016] section 18.8) it references.

A user-defined slicer style consists of the table style ([ISO/IEC29500-1:2016] section 18.8) elements from the referenced table style ([ISO/IEC29500-1:2016] section 18.8) and table style ([ISO/IEC29500-1:2016] section 18.8) elements specified by a group of **CT_SlicerStyleElement** elements.

The **slicerStyleElements** element of a **CT_SlicerStyle** element specifies the slicer-style-specific table style ([ISO/IEC29500-1:2016] section 18.8) elements of the slicer style. The **name** attribute of the **CT_SlicerStyle** element references the user-defined table style ([ISO/IEC29500-1:2016] section 18.8) that specifies the non-slicer-style-specific table style ([ISO/IEC29500-1:2016] section 18.8) elements of the slicer style.

2.3.3 Non-Worksheet PivotTable

Non-Worksheet PivotTables provide a way for Charts ([ISO/IEC29500-1:2016] section 21.2) to be based on PivotTable data without having to show the data in a **worksheet**. For more information see [MS-ODRAWXML].

A Non-Worksheet PivotTable MUST only be referenced from **workbook**.

2.3.4 PivotValues

PivotValues specifies the collection of values that are in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area. The PivotValues contain a collection of PivotValueCells organized as a two dimensional array corresponding to the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

For a Non-Worksheet PivotTable the PivotValues are specified by the **pivotTableData** element (section 2.4.63).

For PivotTables on a **worksheet** the PivotValues are specified by the cells of the worksheet ([ISO/IEC29500-1:2016] section 18.3) cell table in the locations specified by the location element ([ISO/IEC29500-1:2016] section 18.10.1.49) of the PivotTable.

2.3.4.1 PivotValueCell

A PivotValueCell is a point in individual data unit in the data area of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area. PivotValueCells contain summarized values for associated PivotTable data items. Every PivotValueCell can have two kinds of information associated with it, the value and the server formatting information.

2.3.4.1.1 Value

The value of a PivotValueCell is specified to be the number, string, error, date associated with the PivotValueCell.

2.3.4.1.2 Server Formatting

The server formatting of a PivotValueCell specifies formatting to be applied to the PivotValueCell.

2.3.5 Timelines

A Timeline is a mechanism for filtering data in PivotTable ([ISO/IEC29500-1:2016] section 18.10) views, **cube functions** and Charts ([ISO/IEC29500-1:2016] section 21.2) based on Non-Worksheet PivotTables. In the case of using OLAP Timeline source data, a Timeline is based on a key **attribute** of an **OLAP hierarchy**. In the case of using native Timeline source data, a Timeline is based on a **data table column**.

A Timeline has two major parts: a Timeline cache, and a Timeline view. There can be more than one Timeline view based on a single Timeline cache.

2.3.5.1 Timeline Cache

A **Timeline cache** specifies the subset of **Timeline source data** (section 2.3.5.1.1) that is cached for display in **Timeline views** (section 2.3.5.2), as well as properties related to **Timeline** filtering (section 2.3.5). A **Timeline cache** is specified by the **CT_TimelineCacheDefinition** element (section 2.6.112).

A **Timeline cache** has an associated **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) **PivotCache** as specified in section 2.3.5.1.2.

If the **Timeline source data** is an **OLAP data source**, the **sourceName attribute** of the **CT_TimelineCacheDefinition** element specifies the key attribute name of the associated **OLAP hierarchy**. If the **Timeline source data** is a native data source, the **sourceName** attribute of the **CT_TimelineCacheDefinition** element specifies the name of the associated **data table column**.

If the timeline is used to **filter** **PivotTable** views, the **Timeline cache** specifies the **PivotTable** views being filtered as specified in **Timeline Cache Relationship to PivotTable View** (section 2.3.5.1.3).

2.3.5.1.1 Timeline Source Data

The **source data** for a Timeline is specified by the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache as specified in Timeline Cache Relationship to PivotCache.

2.3.5.1.2 Timeline Cache Relationship to PivotCache

A Timeline cache is associated with a PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache through the **pivotCacheId** attribute of the CT_TimelineState element. If the Timeline cache has an associated PivotTable PivotCache, the **timelineData** attribute of the CT_TimelinePivotCacheDefinition element MUST be "true".

Multiple Timeline caches can be associated with one PivotTable PivotCache.

If a Timeline cache is associated, as specified by Timeline Cache Relationship to PivotTable View, with one or more PivotTable views, the PivotTable PivotCache that is associated with the Timeline cache and all PivotTable PivotCaches that are associated with the PivotTable views MUST be based on the same source – an OLAP connection ([ISO/IEC29500-1:2016] section 18.13.5) if the Timeline source data is **OLAP** and a **data table** if the Timeline source data is native, and the PivotTable PivotCaches associated with the PivotTable views MUST NOT be associated with any Timeline cache. The **timelineData** attribute of the CT_TimelinePivotCacheDefinition element for each PivotTable PivotCache associated with the PivotTable views MUST be "false".

2.3.5.1.3 Timeline Cache Relationship to PivotTable View

A Timeline cache can be associated with PivotTable ([ISO/IEC29500-1:2016] section 18.10) views and Charts **(**[ISO/IEC29500-1:2016] section 21.2) based on Non-Worksheet PivotTables, as specified by the **pivotTables** group element of the CT_TimelineCacheDefinition element.

The Timeline State of the Timeline cache is used to apply the PivotTable date filter to the PivotTable **hierarchy** which belongs to the same **dimension** as the hierarchy associated with the **sourceName** attribute of the CT_TimelineState element, in all associated PivotTable views and Charts based on Non-Worksheet PivotTables of the Timeline cache. The **selected** date range in the Timeline cache is converted into selected PivotTable items in the PivotTable date filters by the application to apply the filter state of the Timeline cache to the associated PivotTable views and Charts based on Non-Worksheet PivotTables.

When an **OLAP** PivotTable view is associated with an OLAP Timeline cache, there MUST NOT be more than one Timeline cache for each **OLAP hierarchy**. If the Timeline cache has at least one Chart based on Non-Worksheet PivotTable, then the Timeline cache MUST be OLAP sourced. When a native PivotTable view is associated with a native Timeline cache, there MUST NOT be more than one Timeline cache for each **data table column**.

2.3.5.1.4 Timeline State

Timeline state specifies the information used for display in Timeline view. The **Timeline state** contains two elements, selection and bounds, of type CT_TimelineRange. The selection element specifies the start and end dates of the selection in the Timeline and is used for filtering data in PivotTable ([ISO/IEC29500-1:2016] section 18.10) views and **cube functions**. The bounds element specifies the minimum and maximum dates that can be displayed by the Timeline view.

2.3.5.2 Timeline View

A Timeline view specifies the display of a Timeline (section 2.1.8) on a **worksheet**. The Timeline view is specified by a CT_Timeline element.

Each Timeline view is associated with a Timeline cache as specified in Timeline View Relationship to Timeline Cache. The filtering state of Timeline displayed in the Timeline view is specified by the associated Timeline cache.

Each Timeline view is associated with a drawing ([ISO/IEC29500-1:2016] section 20.5), contained in the Drawings part ([ISO/IEC29500-1:2016] section 12.3.8).

2.3.5.2.1 Timeline View Relationship to Timeline Cache

Each Timeline view is associated with a Timeline cache. The Timeline view is associated with Timeline cache through the **name** attribute of the CT_TimelineCacheDefinition element in the Timeline cache that matches the **cache** attribute of the CT_Timeline element that specifies this Timeline view.

There can be multiple Timeline views associated with a single Timeline cache. The main reason for this is that multiple Timeline views associated with the same Timeline cache provide a mechanism for displaying the filter state in more than one location in the workbook.

2.3.5.3 Timelines and Cube Functions

Each Timeline cache has a **defined name** associated with it as specified by the **name** attribute of the CT_TimelineCacheDefinition element.

The value of the **CT_DefinedName** ([ISO/IEC29500-1:2016] section 18.2.5) element specifying a defined name associated with a Timeline Cache MUST be #N/A.

If the Timeline source data type of a Timeline cache is **OLAP**, **cube functions** can use the defined name of the Timeline cache as a parameter to refer to the selection state of the Timeline cache.

2.3.5.4 Timeline Styles

Timeline styles specify the formatting to apply to visual components of Timeline views. The **style** attribute of the CT_Timeline element specifies the Timeline style to be applied. A Timeline style can be either built-in or user-defined. Built-in Timeline styles are specified in the CT_Timeline element. User-defined Timeline styles are specified in the CT_TimelineStyles element.

A Timeline style is an extension of a table style ([ISO/IEC29500-1:2016] section 18.8) with additional table style elements specific to the formatting of Timeline views. A user-defined Timeline style is specified by a CT_TimelineStyle element and the table style it references.

A user-defined Timeline style consists of the table style elements from the referenced table style and table style elements specified by a group of CT_TimelineStyleElement elements.

The **TimelineStyleElements** element of a CT_TimelineStyle element specifies the Timeline-style-specific table style elements of the Timeline style. The **name** attribute of the CT_TimelineStyle element references the user-defined table style that specifies the Timeline-style-specific table style elements of the Timeline style.

2.3.6 Rich Data

Rich Data is an extensible mechanism to store compound data objects and their properties in a workbook.

2.3.6.1 Rich Values

Each rich value consists of three components, **rich value type**, **key value pairs (KVP)**, and an optional **rich value fallback**.

The rich value type is indicated by a **CT_RichValueStructure** (section 2.6.180). All type names, specified by the **t** attribute, that begin with an underscore symbol MAY have restrictions on required key value pairs (KVP) and other defined behavior.

The set of key value pairs (KVP) is defined in **CT_RichValue** (section 2.6.175) and **CT_RichValueStructure** (section 2.6.180).

The rich value fallback is optionally defined in **CT_RichValueFallback** (section 2.6.178) and stands in place of the rich value for some features.

While there are restrictions on required key value pairs (KVP) for some rich value types (see the sub-sections of this section for more details), additional key value pairs (KVP) are allowed.

2.3.6.1.1 Array Type

The **rich value type** for a **rich array**.

This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_array" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"array"	a	An index to a **CT_ArrayValue** (section 2.6.159). This is a zero-based index.

This rich value type has the following **rich value key flag** definitions for any other key value pairs (KVP). These rich value key flag definitions do not apply to the **rich value keys** listed above. See section 2.3.6.3 for more information.

Flag	Default Value
ShowInCardView	True
ShowInDotNotation	True
ShowInAutoComplete	True

2.3.6.1.2 Entity Type

The **rich value type** for an entity represents a set of **key value pairs (KVP)**.

This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_entity".

2.3.6.1.3 Error Types

The **rich value type** for errors is an extension of **cell error values**. This type represents a modern error in the file, which enables the storage of additional descriptive properties about the error.

This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	Integer, see following sub-sections for more information on specific errors.

This rich value type has the additional optional key value pair (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"subType"	i	Integer, used internally to differentiate help topic identifiers.

2.3.6.1.3.1 Blocked Error Type

A Blocked error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

A Blocked error will show as #BLOCKED!. These errors indicate that the connection to the **service** was blocked.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	10

2.3.6.1.3.2 Busy Error Types

A Busy error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

A Busy error will show as #BUSY!. These errors indicate that we are waiting on data from the service.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have one of the following sets of **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	14

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	17
"targetValue"	r	An index to a **rich value type** that is waiting on data.

2.3.6.1.3.3 Calc Error Type

A Calc error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

A Calc error will show as #CALC!. These errors indicate a scenario currently unsupported by the calculation engine.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	13

2.3.6.1.3.4 Connect Error Type

A Connect error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

A Connect error will show as #CONNECT!. These errors indicate that an attempt to connect to the **service** has failed.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	9

2.3.6.1.3.5   Name Error Type

A Name error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

A Name error will show as #NAME?. These errors indicate that that a **formula** contained unrecognized text.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	4

2.3.6.1.3.6   Field Error Type

A Field error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

A Field error will show as #FIELD!. These errors indicate that a **rich value key** was not found.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	12
"field"	s	A string representing the name of the rich value key that could not be found.

2.3.6.1.3.7   Spill Error Type

A Spill error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

A Spill error will show as #SPILL!. These errors indicate that a **formula** result cannot be shown due to non-empty **adjacent cells**.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	8
"colOffset"	i	An integer representing the count of additional columns in the result.
"rwOffset"	i	An integer representing the count of additional of rows in the result.

2.3.6.1.3.8   Unknown Error Type

An Unknown error is a subset of the **rich value type** for errors (section 2.3.6.1.3).

An Unknown error will show as #UNKNOWN!. These errors indicate a **rich value** with an unknown rich value type.
This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_error" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"errorType"	i	11

2.3.6.1.4 Formatted Number Type

The **rich value type** for formatted numbers. The number is stored as the fallback in **CT_RichValueFallback** (section 2.6.178).

This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_formattednumber" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"_Format"	spb	An index to a **supporting property bag**. For more information about _Format see section 2.3.6.3.

2.3.6.1.5 Hyperlink Type

The **rich value type** for a hyperlink contains a hyperlink and optional display text.

This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_hyperlink" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"Address"	s	String representation of the hyperlink

This rich value type has the additional optional key value pair (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"Text"	s	String representation of the display text associated with the hyperlink

This rich value type has the following **rich value key flag** definitions for any other key value pairs (KVP). These rich value key flag definitions do not apply to the **rich value keys** listed above. See section 2.3.6.3 for more information.

Flag	Default Value
ShowInCardView	False
ShowInDotNotation	False
ShowInAutoComplete	False

2.3.6.1.6 ImageUrl Type

The **rich value type** for an ImageUrl represents information for a URL to an image and associated optional properties.

This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_imageurl" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"Address"	s	String representation of the Url

This rich value type has the additional optional key value pairs (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"Attribution Size"	i	Integer value of the minimum size

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
		in pixels that requires the attribution to be rendered
"Attribution"	r	Index to a nested SourceAttribution rich value type (section 2.3.6.1.8)
"Text"	s	String representation of the alt text associated with the image
"More Images Address"	s	String representation of the Url for more images
"ComputedImage"	b	Boolean value that when true indicates the image can be generated on demand.

This rich value type has the following **rich value key flag** definitions for any other key value pairs (KVP). These rich value key flag definitions do not apply to the **rich value keys** listed above. See section 2.3.6.3 for more information.

Flag	Default Value
ShowInCardView	True
ShowInDotNotation	True
ShowInAutoComplete	True

2.3.6.1.7 Linked Entity Types

These types represent **service** connected **rich value types**.

2.3.6.1.7.1   Linked Entity and Linked Entity Core Types

All Linked Entities MUST contain a Linked Entity Core Value, which represents the information received from the **service**.

The Linked Entity **rich value type** is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_linkedentity" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%cvi"	r	Integer that identifies the index to the nested Linked Entity Core Value

Linked Entity Core rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_linkedentitycore" and MUST have the following key value pairs (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%EntityCulture"	s	String value for the service culture
"%EntityId"	s	String value that when combined with the "%EntityServiceId" and "%EntityCulture" creates a unique identifier
"%EntityServiceId"	i	Integer value that is an index to the service domain

Linked Entity Core rich value type has the additional optional key value pairs (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%DataProviderExternalLink"	s	String value that is provided by and targets the service.

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%DataProviderExternalLinkLogo"	s	String value that is a **URL** that points to a logo that identifies the service.
"%EntitySubDomainId"	i	Integer value that is an index to the service sub-domain.
"%IsRefreshable"	b	Boolean value that when true indicates the rich value is connected and can be refreshed to obtain the latest data.
"%ProviderInfo"	s	String value indicating the service provider.
"VDPID/VSID"	s	String value used by the service.

This rich value type has the following **rich value key flag** definitions for any other key value pairs (KVP). These rich value key flag definitions do not apply to the **rich value keys** listed above. See section 2.3.6.3 for more information.

Flag	Default Value
ShowInCardView	True
ShowInDotNotation	True
ShowInAutoComplete	True

2.3.6.1.7.2   Linked Entity 2 and Linked Entity 2 Core Types

Linked Entity 2s MAY reference a Linked Entity 2 Core Value, which represents the information received from the **service**.

The Linked Entity 2 **rich value type** is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_linkedentity2" and MUST have the following **key value pairs (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%EntityCulture"	s	String value for the service culture.
"%EntityId"	s	String value that when combined with the %EntityServiceId and %EntityCulture values will create a unique identifier for the service.
"%EntityServiceId"	i	Integer value that is an index to the service domain.

Linked Entity 2 rich value type has the additional optional key value pair (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%cvi"	r	Integer that identifies the index to the nested Linked Entity 2 Core Value.

Linked Entity 2 Core rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_linkedentity2core" and MUST have the following key value pairs (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%EntityCulture"	s	String value for the service culture
"%EntityId"	s	String value that when combined with the "%EntityServiceId" and "%EntityCulture" creates a unique identifier
"%EntityServiceId"	i	Integer value that is an index to the service domain

Linked Entity 2 Core rich value type has the additional optional key value pair (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"%IsRefreshable"	b	Boolean value that when true indicates the rich value is connected and can be refreshed to obtain the latest data.
"VDPID/VSID"	s	String value used by the **service (1)**.
"%EntityDomainIdString"	s	Optional string value used to supplement the %EntityServiceId integer value.
"%DataRetrievedTime"	n	Optional number value that is the date/time when the linked entity data was retrieved from the **data provider**.
"%InfoToolTipLabelNames"	a	Optional array of string values that are expected to have optional corresponding values in the %InfoToolTiplabelValues.
"%InfoToolTipLabelValues"	a	Optional array of string values that are expected to correspond to names in %InfoToolTipLabelnames.
"%InfoToolTipLabelValuesType"	a	Optional array of values for time zone localization.
"%ClassificationId"	s	Optional string value that is used to apply a Windows Information Protection (WIP) policy.
"%DataProviderString"	s	Optional string value that identifies the data provider.
"%OutdatedReason"	i	Optional integer that indicates why the rich value is outdated.

These rich value types has the following **rich value key flag** definitions for any other key value pairs (KVP). These rich value key flag definitions do not apply to the **rich value keys** listed above. See section 2.3.6.3 for more information.

Flag	Default Value
ShowInCardView	True
ShowInDotNotation	True
ShowInAutoComplete	True

2.3.6.1.8 SourceAttribution Type

The **rich value type** for SourceAttribution represents information about data source and license.

This rich value type is identified by having a a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_sourceattribution" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"Source"	s or r	String or a nested Hyperlink rich value type (section 2.3.6.1.5)

This rich value type has the additional optional key value pairs (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"License"	s or r	String or a nested Hyperlink rich value type (section 2.3.6.1.5)

This rich value type has the following **rich value key flag** definitions for any other key value pairs (KVP). These rich value key flag definitions do not apply to the **rich value keys** listed above. See section 2.3.6.3 for more information.

Flag	Default Value
ShowInCardView	True
ShowInDotNotation	True
ShowInAutoComplete	True

2.3.6.1.9 Stock History Cache Type

The **rich value type** for a stock history cache represents an optional cache of the historical stock data from the **service**. This rich value MAY not be persisted when saved. This cache exists for performance reasons only.

This rich value type is identified by having a a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_stockhistorycache".

2.3.6.1.10   Web Image Type

The **rich value type** for a web image represents information for an image from a URL and associated optional properties.

This rich value type is identified by having a **CT_RichValueStructure** (section 2.6.180) **t** attribute of "_webimage" and MUST have the following **key value pair (KVP)**:

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"WebImageIdentifier"	i	An integer for a zero-based index. This index MUST reference a **CT_WebImageSupportingRichData** (section 2.6.217).

This rich value type has the additional optional key value pairs (KVP):

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
"Attribution"	spb	An index to a **supporting property bag** containing information about data source and license.
"Text"	s	String representation of the alt text associated with the image.
"ComputedImage"	b	Boolean value that when true indicates the image can be generated on demand.
"ImageSizing"	i	Integer value that indicates the dimension modes of the image. There are 4 supported values: 0, 1, 2, 3. At 0, image fits to the cell and maintains its aspect ratio. At 1, image fits to the cell and ignore its aspect ratio. At 2, image maintains its original size and may exceed the cell boundary.

CT_Key "n" attribute	CT_Key "t" attribute	CT_Value
		At 3, image size is customized by "ImageHeight" and "ImageWidth".
"ImageHeight"	d	Real number representation of the image height in pixels. This property should only be present when "ImageSizing" is set to 3.
"ImageWidth"	d	Real number representation of the image width in pixels. This property should only be present when "ImageSizing" is set to 3

This rich value type has the following **rich value key flag** definitions for any other key value pairs (KVP). These rich value key flag definitions do not apply to the **rich value keys** listed above. See section 2.3.6.3 for more information.

Flag	Default Value
ShowInCardView	True
ShowInDotNotation	True
ShowInAutoComplete	True

2.3.6.2 Supporting Property Bags

Each **supporting property bag** is comprised of a set of **key value pairs (KVP)**.

The set of key value pairs (KVP) is defined in **CT_SupportingPropertyBag** (section 2.6.188) for the values and **CT_SupportingPropertyBagStructure** (section 2.6.195) for the keys.

Supporting property bags can be the data portion of a key value pair (KVP) in a **rich value** to give extra information.

2.3.6.3 Special Keys and Key Flags

All **rich value keys** that begin with a non-alphanumeric ASCII character MAY be used internally to define behavior.

The following rich value keys define special behavior.

Key name	Key definitions
"_Attribution"	This key MUST reference a **supporting property bag** that contains information about the source and license attribution.
"_CanonicalPropertyNames"	This key MUST reference a supporting property bag that contains **key value pairs (KVP)** of strings. The **supporting property bag key** in each pair contains a key that is localized. The corresponding value contains a string representation of the key that is not locale-specific.
"_ClassificationId"	This key references a string value used to apply a Windows Information Protection (WIP) policy.
"_CRID"	Some **rich value types** MAY put limitations on what type this key MUST reference. See individual rich value type descriptions (under section 2.3.6.1) for any limitations. If this key is a part of a **rich value** with an unknown rich value type (for more information see section 2.3.6.1.3.8), this rich value MUST be preserved.
"_Display"	This key MUST reference a supporting property bag that contains

Key name	Key definitions
	information that can be used to determine how the rich value is displayed.
"_DisplayString"	This key MUST reference a string that can be shown in the **cell**.
"_Flags"	This key MUST reference a supporting property bag that contains key value pairs (KVP) containing rich value keys and supporting property bags containing associated **rich value key flags**, which define behavior for the associated rich value key value pair (KVP).
"_Format"	This key MUST reference a supporting property bag that is a list of indices to a **CT_RichStyle** (section 2.6.170). The supporting property bag key of the key value pair (KVP) in the supporting property bag determines which rich value key the **CT_RichStyle** is associated with.
"_Icon"	This key contains a value that describes the icon that can be used in render.
"_Provider"	This key MUST reference a supporting property bag that contains information about the service provider.
"_Self"	This key SHOULD NOT exist in the file and will be removed when the file is saved. When a supporting property bag references this rich value key, it indicates the supporting property bag references the rich value itself, and not a key value pair (KVP) of the rich value.
"_SubLabel"	This key MUST reference a supporting property bag that contains key value pairs (KVP) containing rich value keys and supporting property bags containing strings, which define the label that can be used to describe the associated rich value key value pair (KVP).
"_ViewInfo"	This key MUST reference a supporting property bag that contains information that MAY be used to customize rich value visualizations.

The following supporting property bag key defines special behavior.

Key name	Key definitions
"^Order"	This supporting property bag key is associated with a **supporting property bag array** of strings that SHOULD be comprised of rich value keys in the associated rich value and can be used to display the rich value key value pairs (KVP) in a different order.

Rich value keys with defined behavior for all rich value types are listed in **CT_RichValueGlobalType** (section 2.6.179).
Rich value keys with defined behavior for a particular rich value type are listed in **CT_RichValueTypes** (section 2.6.186). The rich value type can be identified by matching the **CT_RichValueType** (section 2.6.182) **name** attribute to the **CT_RichValueStructure** (section 2.6.180) **t** attribute.
Both **CT_RichValueGlobalType** and **CT_RichValueTypes** contain **CT_RichValueType** (section 2.6.182), which defines the rich value key flags and their values for each of the reserved rich value keys.
Rich value key flags are associated with key value pairs (KVP) and control particular behavior. Any flags that are absent are treated as having a value of false unless the rich value type has a different default for that rich value key flag. See sections under section 2.3.6.1 for specific type definitions.
Rich value key flags are listed here:

Flag name	Flag definitions
ShowInCardView	False indicates that we hide this key value pair (KVP) in the default Card View

Flag name	Flag definitions
ShowInDotNotation	False indicates that we hide this key value pair (KVP) from **formulas** and the **object model**
ShowInAutoComplete	False indicates that we hide this key value pair (KVP) from **AutoComplete**, **sort**, **filter**, and Find
ExcludeFromFile	True indicates that we do not write this key value pair (KVP) into the file, it only exists in memory
ExcludeFromCalcComparison	True indicates that we exclude this key value pair (KVP) when comparing rich values.

CT_RichValueType information that is not recognized at runtime will be persisted unless the associated rich value type is removed. **CT_RichValueType** information that contradicts runtime expectations will be ignored and will not be persisted.

2.3.6.4 Rich Styles and Properties

Rich values MAY contain particular properties that are used to define the **style** for a given **key value pair (KVP)**. See **CT_RichFormatProperties** (section 2.6.167) and the "_Format" **rich value key** (section 2.3.6.3) for more information.

Property Name	Definition
IsHeroFlag	True indicates that the related key value pair (KVP) is the hero image for the rich value. This MAY be emphasized.
IsTitleFlag	True indicates that the related key value pair (KVP) is the title for the rich value. This MAY be used for visualizing the rich value.
IsPrimaryFlag	True indicates that the related key value pair (KVP) is the primary for the rich value. This MAY be emphasized.
IsSecondaryFlag	True indicates that the related key value pair (KVP) is the secondary for the rich value. This MAY be emphasized.
IsFooterFlag	True indicates that the related key value pair (KVP) is the footer for the rich value. This MAY be used for visualizing the rich value.
IsCellDisplayFlag	True indicates that the related **rich value data** MAY be shown in the **cell**.

2.3.7 Threaded Comments

Threaded comments represent a collaborative annotation system that replaces and/or works in addition to legacy comments ([ISO/IEC29500-1:2016] section 18.7). The **comment threads** attached to and associated with **cells** in a **worksheet** are stored separately from other cell content. A comment thread attached to a cell is comprised of a top-level **threaded comment** and its replies, if there are any, to provide annotations, assumptions, instructions, reminders, feedback, collaborative discussion among coauthors, and so forth. A threaded comment specified by complex type **CT_ThreadedComment** (section 2.6.205) contains information about the author, **mentions** in the comment, and its parent if it is not a top-level comment.

2.3.7.1 Persons

Information about people who have authored and/or have been mentioned in **threaded comments** is specified by complex type **CT_Person** (section 2.6.203), and is stored separately from the comments.

When a user creates a threaded comment, a person element of **CT_Person** (section 2.6.203) is generated for the author if it is their first threaded comment in this **workbook**. To associate the author to the comment, the **id** of the person element MUST correspond to the **personId** of the **threadedComment** element specified by complex type **CT_ThreadedComment** (section 2.6.205).

When a user creates a **mention** within a comment, a person element of **CT_Person** is generated for the person mentioned if it's the first time the person is mentioned. The **providerId** of the person element MUST be set to "PeoplePicker". To associate the person to the mention, the **id** of the person element MUST correspond to the **mentionpersonId** of the **mention** element specified by complex type **CT_Mention** (section 2.6.202).

2.3.7.2 Mentions

A **mention** is a portion of the text in a **threaded comment** associated with a person's information. The **startIndex** and the **length** attributes of **CT_Mention** (section 2.6.202) specify a range in the **text** element of **CT_ThreadedComment** (section 2.6.205) as the mention text.

2.3.7.3 Legacy Comment Placeholders

To integrate with legacy **comments** ([ISO/IEC29500-1:2016] section 18.7) and aid backward compatibility, a legacy comment placeholder is created along with each top-level **threaded comment**. This legacy comment MAY contain information about threaded comment compatibilities. This comment SHOULD NOT be displayed unless the file is opened in a version that does not support threaded comments. The **uid** ([ISO/IEC29500-1:2016] section 18.7.3) of the comment SHOULD correspond to the **id** attribute of the associated threaded comment specified by **CT_ThreadedComment** (section 2.6.205). Additionally, the **author** of the comment MUST contain "tc={uid}", where {uid} is the corresponding threaded comment **id.** The **ref** attribute specified in **comment**([ISO/IEC29500-1:2016] section 18.7.3) SHOULD correspond to the **ref** attribute specified in **CT_ThreadedComment**. If the **ref** attributes don't match, the **ref** specified in legacy comment placeholder will be used while displaying the threaded comment.

2.3.7.3.1 Reconciliation

After all parts are loaded, reconciliation will be done in two steps.

1. Enumerate all top-level **threaded comments** in **comment threads** in the entire **workbook** to adjust their location or delete them.

- If the corresponding placeholder is at a different location, adjust the comment thread to the location of the first placeholder that corresponds to the comment.

- If the corresponding placeholder is not found, delete the comment thread.

2. Enumerate all placeholders.

- If any comment thread has more than one placeholder, copy it for each additional placeholder. Each copied threaded comment, including top-level comment and reply, is assigned a new unique identifier.

- If a placeholder has no corresponding comment thread, remove the placeholder.

The following table shows how comment loading is handled if changes were made in a previous version of Excel.

Situation	Description	Reconciliation
Move	Corresponding placeholder is at a different location	Change the **ref** of all the **threaded comments** in the **comment thread** to the location of the placeholder.
Delete	Corresponding placeholder is not found	Delete the entire **comment thread**.
Copy	Multiple corresponding placeholders are found	Copy the entire **comment thread** for each additional placeholder and assign a new unique id.
Orphan	Placeholder with no corresponding **comment thread** are found	Delete the placeholder.

2.3.8 Named Sheet Views

Named sheet views represent a stored collection of sort and/or filter settings for the **AutoFilters** found on a specific sheet.

A **named sheet view** is associated with **worksheet**, and is made up of a set of **nsvfilters**, with each nsvfilter being associated with a single AutoFilter on the worksheet. A named sheet view only stores sort and/or filter settings that are associated with an AutoFilter and does not include other content.

2.3.8.1 Table Filters and Worksheet Filters

Each **AutoFilter** is described by a **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2), and those can be contained within a **CT_Table** ([ISO/IEC29500-1:2016] section A.2) element or within a **CT_Worksheet** ([ISO/IEC29500-1:2016] section A.2) element.

When **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2) that describes the AutoFilter is contained within a **CT_Table** ([ISO/IEC29500-1:2016] section A.2) element then the AutoFilter is considered to be owned by that **table**.

When the **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2) that describes the AutoFilter is contained within a **CT_Worksheet** ([ISO/IEC29500-1:2016] section A.2) element then the AutoFilter is considered to be owned by that **worksheet**.

2.3.8.2 Reconciliation

When loading a file, each **CT_NsvFilter** (section 2.6.212) needs to be matched with a specific **AutoFilter**. And beyond that each **columnFilter** and **sortRule** within the **nsvfilter** needs to be matched with specific columns within that AutoFilter.

After all parts are loaded this reconciliation is done as sequence of checks in priority order. The match with the highest priority SHOULD be taken. If all checks are exhausted with no match being found the nsvfilter SHOULD be dropped. Similarly, if a specific **columnFilter** or **sortRule** element cannot match to a specific column then those elements SHOULD be dropped.

To connect a **CT_NsvFilter** (section 2.6.212) with to a specific AutoFilter the priority sequence of checks is as follows

1. A match exists between the **filterId** attribute on the **CT_NsvFilter** (section 2.6.212) and a **uid** (section 2.5.10) attribute stored on a **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2).

2. The **tableId** attribute on the **CT_NsvFilter** (section 2.6.212) is not equal to 0 AND there is a table owned AutoFilter (as explained in section 2.3.8.1) such that the **tableId** attribute matches the **id** attribute on that **CT_Table** ([ISO/IEC29500-1:2016] section A.2)

3. The **tableId** attribute on the **CT_NsvFilter** (section 2.6.212) is 0 AND there is a worksheet owned AutoFilter (as explained in section 2.3.8.1)

To map each **columnFilter** element within **CT_NsvFilter** (section 2.6.212) to a specific column the sequence of checks is as follows

1. The matched AutoFilter is table owned (as explained in section section 2.3.8.1) and the **CT_Table** ([ISO/IEC29500-1:2016] section A.2) describing that **table** contains a **tableColumn** element which specifies **uid** (section 2.5.8) attribute that matches **id** attribute on **CT_ColumnFilter** (section 2.6.209). In this case **id** attribute on the matching **CT_TableColumn** ([ISO/IEC29500-1:2016] section A.2) identifies the column this **columnFilter** element applies to.

2. The **ref** attribute on the **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2) that describes the matched AutoFilter specifies a range large enough for the **colId** attribute on **CT_ColumnFilter** (section 2.6.209) to be a column within that range. In this case the **colId** identifies the column this **columnFilter** element applies to.

To map each **sortRule** element within **CT_SortRules** (section 2.6.214) to a specific column the sequence of checks is as follows

1. The matched AutoFilter is table owned (as explained in section section 2.3.8.1) and the **CT_Table** ([ISO/IEC29500-1:2016] section A.2) describing that table contains a **tableColumn** element which specifies **uid** (section 2.5.8) attribute that matches **id** attribute on **CT_SortRule** (section 2.6.213). In this case **id** attribute on the matching **CT_TableColumn** ([ISO/IEC29500-1:2016] section A.2) identifies the column this **sortRule** element applies to.

2. The **ref** attribute on the **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2) that describes the matched AutoFilter specifies a range large enough for the **colId** attribute on **CT_ SortRule** (section 2.6.213) to be a column within that range. In this case the **colId** identifies the column this **sortRule** element applies to.

2.4   Global Elements

2.4.1   pivotTableReference

A **pivotTableReference** element is a CT_PivotTableReference type element, as specified in section 2.6.87, that specifies a PivotTable ([ISO/IEC29500-1:2016] section 18.10) part identifier for the **workbook**. The PivotTable specified by this element MUST be a Non-Worksheet PivotTable. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

2.4.2   pivotTableServerFormats

A **pivotTableServerFormats** is a CT_PivotTableServerFormats element that specifies collection of numeric formats specified by elements of complex type **CT_ServerFormat** ([ISO/IEC29500-1:2016] section 18.10.1.86), for a PivotTable ([ISO/IEC29500-1:2016] section 18.10) that is specified by a pivotTableReference element in the extension of a **workbook**. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016]. If the PivotTable ([ISO/IEC29500-1:2016] section 18.10) is not a Non-Worksheet PivotTable, MUST NOT be specified.

2.4.3   f

Target namespace: http://schemas.microsoft.com/office/excel/2006/main

Referenced by: CT_WebExtension, CT_CfRule, CT_Cfvo, CT_DataValidationFormula, CT_SparklineGroup, CT_Sparkline, CT_PivotUserEdit

The **f** element is an **ST_Formula** element, as specified in [ISO/IEC29500-1:2016] section 18.18.35, that specifies a generic **formula** that adheres to section 2.2.2.

An application can adjust the **cell references** within this formula when the **worksheet** layout changes, even when the containing **ext** element, as specified in [ISO/IEC29500-1:2016] section 18.2.7, is not recognized by the application. See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="f" type="x:ST_Formula"/>
```

See section 5.1 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.4   ref

Target namespace: http://schemas.microsoft.com/office/excel/2006/main

The **ref** element is a **CT_Ref** type element, as specified in section 2.6.146, that specifies a **cell reference**.

An application can adjust this cell reference when the **worksheet** layout changes, even when the containing **ext** element, as specified in [ISO/IEC29500-1:2016] section 18.2.7, is not recognized by the application. See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ref" type="CT_Ref"/>
```

See section 5.1 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.5   sqref

Target namespace: http://schemas.microsoft.com/office/excel/2006/main

Referenced by: CT_ConditionalFormatting, CT_DataValidation, CT_Sparkline, CT_IgnoredError, CT_ProtectedRange

A **sqref** element is a **CT_Sqref** type element, as specified in section 2.6.147, that specifies a list of **cell references**.

An application can adjust these cell references when the **worksheet** layout changes, even when the containing **ext** element, as specified in [ISO/IEC29500-1:2016] section 18.2.7, is not recognized by the application. See [ISO/IEC29500-3:2015] section 10.1.2 for more information about how extension lists are used.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="sqref" type="CT_Sqref"/>
```

See section 5.1 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.6 conditionalFormattings

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **conditionalFormattings** element is a **CT_ConditionalFormattings** type element, as specified in section 2.6.1, that specifies **conditional formatting** information for the **worksheet**. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="conditionalFormattings" type="CT_ConditionalFormattings"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.7 dataValidations

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

The **dataValidations** element is a **CT_DataValidations** type element, as specified in section 2.6.3, that specifies a group of **data validation** items on the **sheet**. This element also specifies data validation properties of a sheet that are used by the application user interface. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dataValidations" type="CT_DataValidations"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.8 sparklineGroups

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **sparklineGroups** element is a **CT_SparklineGroups** type element, as specified in section 2.6.6, that specifies the groups of **sparklines** on the **sheet**. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="sparklineGroups" type="CT_SparklineGroups"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.9 slicerList

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **slicerList** element is a **CT_SlicerRefs** type element, as specified in section 2.6.11, that specifies a list of slicer, as specified in section 2.3.2, part identifiers for the **worksheet**. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicerList" type="CT_SlicerRefs"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.10 protectedRanges

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **protectedRanges** element is a **CT_ProtectedRanges** type element, as specified in section 2.6.55, that specifies a group of protected **ranges** on the **sheet**. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="protectedRanges" type="CT_ProtectedRanges"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.11 ignoredErrors

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

An **ignoredErrors** element is a **CT_IgnoredErrors** type element, as specified in section 2.6.53, that specifies a list of **cell ranges** and the types of cell errors that are to be ignored for each of those specific cell ranges. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ignoredErrors" type="CT_IgnoredErrors"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.12 pivotCaches

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **pivotCaches** element is a **CT_PivotCaches** element, as specified in [ISO/IEC29500-4:2016] section A.2, that specifies a list of **PivotTable**, as specified in [ISO/IEC29500-1:2016] section 18.10, **PivotCache** identifier elements. The list of elements specifies the PivotTable **PivotCaches** used by slicer caches, as specified in section 2.1.4, with **OLAP** slicer source data, as specified in section

2.3.2.1.1. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotCaches" type="x:CT_PivotCaches"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.13 slicerCaches

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **slicerCaches** element is a **CT_SlicerCaches** type element, as specified in section 2.6.13, that specifies a group of slicer cache, as specified in section 2.1.4, identifiers for the **workbook**. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicerCaches" type="CT_SlicerCaches"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.14 workbookPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **workbookPr** element is a **CT_WorkbookPr** element, as specified in section 2.6.10, that specifies additional properties for a **workbook**. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="workbookPr" type="CT_WorkbookPr"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.15 calculatedMember

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **calculatedMember** element is a **CT_CalculatedMember** type element, as specified in section 2.6.15, that specifies extended properties of a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, **OLAP calculated** member. See section 2.2.4.6 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="calculatedMember" type="CT_CalculatedMember"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.16 cacheHierarchy

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **cacheHierarchy** element is a **CT_CacheHierarchy** type element, as specified in section 2.6.24, that specifies the extended properties of a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, named set. See section 2.2.4.6 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="cacheHierarchy" type="CT_CacheHierarchy"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.17 dataField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **dataField** element is a **CT_DataField** type element, as specified in section 2.6.25, that specifies extended information about a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, data **field** item. See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dataField" type="CT_DataField"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.18 pivotField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **pivotField** element is a **CT_PivotField** element, as specified in section 2.6.31, that specifies properties of a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, **field**. See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotField" type="CT_PivotField"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.19 pivotTableDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **pivotTableDefinition** element is a **CT_PivotTableDefinition** type element, as specified in section 2.6.32, that specifies additional properties of the PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, view. See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotTableDefinition" type="CT_PivotTableDefinition"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.20 pivotCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **pivotCacheDefinition** element is a **CT_PivotCacheDefinition** type element, as specified in section 2.6.33, that specifies the extended properties of a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, **PivotCache** definition. See section 2.2.4.6 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotCacheDefinition" type="CT_PivotCacheDefinition"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.21 connection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **connection** element is a **CT_Connection** type element, as specified in section 2.6.34, that specifies the extended properties of an external connection, as specified in [ISO/IEC29500-1:2016] section 18.13. If this element exists, the **type** attribute of the ancestor **CT_Connection** element, as specified in [ISO/IEC29500-4:2016] section A.2, MUST be equal to "5". See section 2.2.4.1 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="connection" type="CT_Connection"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.22 table

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **table** element is a **CT_Table** type element, as specified in section 2.6.35, that specifies alternate text properties for the table. See section 2.2.4.10 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="table" type="CT_Table"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.23 slicerStyles

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **slicerStyles** element is a **CT_SlicerStyles** type element, as specified in section 2.6.51, that specifies a group of slicer styles, as specified in section 2.3.2.4. See section 2.2.4.9 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicerStyles" type="CT_SlicerStyles"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.24 dxfs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **dxfs** element is a **CT_Dxfs** element, as specified in [ISO/IEC29500-4:2016] section A.2, that specifies the list of style differential formats (DXFs), as specified in [ISO/IEC29500-1:2016] section 18.8. See section 2.2.4.9 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dxfs" type="x:CT_Dxfs"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.25 oleItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

An **oleItem** element is a **CT_OleItem** type element, as specified in section 2.6.46, that specifies an **Object Linking and Embedding (OLE)** data item, as specified in [ISO/IEC29500-1:2016] section 18.14, with associated cached values. See section 2.2.4.3 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="oleItem" type="CT_OleItem"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.26 pivotHierarchy

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **pivotHierarchy** element is a **CT_PivotHierarchy** type element, as specified in section 2.6.47, that specifies multiple data items based on the same **OLAP measure** that exists in a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, view. See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotHierarchy" type="CT_PivotHierarchy"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.27 cacheField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

The **cacheField** element is a **CT_CacheField** type element, as specified in section 2.6.48, that specifies that duplicate **OLAP measures** exist in a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, **PivotCache** definition. See section 2.2.4.6 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="cacheField" type="CT_CacheField"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.28 id

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

An **id** element is an **ST_Guid** element, as specified in [ISO/IEC29500-1:2016] section 22.9.2.4, that specifies an identifier for a **conditional formatting** rule. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="id" type="x:ST_Guid"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.29 iconFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

An **iconFilter** element is a **CT_IconFilter** type element, as specified in section 2.6.57, that specifies the properties of an **icon filter**. See section 2.2.4.5, section 2.2.4.10, and section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="iconFilter" type="CT_IconFilter"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.30 filter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **filter** element is a **CT_Filter** type element, as specified in section 2.6.58, that specifies the properties of a **filter**. See section 2.2.4.5, section 2.2.4.10, and section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="filter" type="CT_Filter"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.31 customFilters

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **customFilters** element is a **CT_CustomFilters** type element, as specified in section 2.6.59, that specifies the properties of **custom filters**. See section 2.2.4.5, section 2.2.4.10, and section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="customFilters" type="CT_CustomFilters"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.32 sortCondition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **sortCondition** element is a **CT_SortCondition** type element, as specified in section 2.6.61, that specifies a **sort condition** to apply to a **range**. See section 2.2.4.5, section 2.2.4.7, section 2.2.4.10, and section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="sortCondition" type="CT_SortCondition"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.33 sourceConnection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CacheSourceExt

A **sourceConnection** element is a **CT_SourceConnection** type element, as specified in section 2.6.62, that specifies the name of a connection of the cache source element on a pivot cache. See section 2.2.4.6 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="sourceConnection" type="CT_SourceConnection"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.34 formControlPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **formControlPr** element is a **CT_FormControlPr** type element, as specified in section 2.6.65, that specifies properties of form control objects. This element is the **root element** of the control properties part, as specified in section 2.1.1.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="formControlPr" type="CT_FormControlPr"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.35 datastoreItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **datastoreItem** element is a **CT_DatastoreItem** type element, as specified in section 2.6.66, that specifies properties for an embedded custom data part, as specified in section 2.1.2. This element is the **root element** of the custom data properties part, as specified in section 2.1.3.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="datastoreItem" type="CT_DatastoreItem"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.36 slicers

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **slicers** element is a **CT_Slicers** type element, as specified in section 2.6.67, that specifies all the slicer views, as specified in section 2.3.2.2, on the **sheet**. This element is the **root element** of the slicers part, as specified in section 2.3.2.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicers" type="CT_Slicers"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.37 slicer

Target namespace: http://schemas.microsoft.com/office/drawing/2010/slicer

A **slicer** element is a **CT_Slicer** type element, as specified in section 2.6.69, that specifies which slicer view, as specified in section 2.3.2.2, is associated with this drawing element. See section 2.2.4.2 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicer" type="CT_Slicer"/>
```

See section 5.2 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.38 slicerCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

A **slicerCacheDefinition** element is a **CT_SlicerCacheDefinition** type element, as specified in section 2.6.70, that specifies a slicer cache, as specified in section 2.3.2.1. This element is the **root element** of the slicer cache part.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicerCacheDefinition" type="CT_SlicerCacheDefinition"/>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.39 pivotCaches

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **pivotCaches** element is a **CT_PivotCaches** element, as specified in [ISO/IEC29500-4:2016] section A.2 that specifies a list of **PivotTable**, as specified in [ISO/IEC29500-1:2016] section 18.10,

PivotCache identifier elements. The list of elements specifies the PivotTable **PivotCaches.** See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016]. The **pivotCacheDefinition** ([ISO/IEC29500-1:2016] section 18.10.1.67) element identified by the relationship identifier in the **CT_PivotCache** ([ISO/IEC29500-4:2016] section A.2) child element of this element, MUST satisfy the following criteria.

- There MUST be a CT_PivotCacheIdVersion element in the extension of the element **pivotCacheDefinition**.

- The **type** attribute of the **CT_CacheSource** ([ISO/IEC29500-4:2016] section A.2) child element of the element **pivotCacheDefinition**, MUST have the value **external** specified by **ST_SourceType** ([ISO/IEC29500-1:2016] 18.18.75).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotCaches" type="x:CT_PivotCaches"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.40 pivotTableReferences

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **pivotTableReferences** element is a CT_PivotTableReferences element, as specified in section 2.6.86, that specifies a list of PivotTable ([ISO/IEC29500-1:2016] section 18.10) part identifiers for the **workbook**. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotTableReferences" type="CT_PivotTableReferences"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.41 queryTable

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **CT_QueryTable** element (section 2.6.88) that specifies extended properties of a **query table** ([ISO/IEC29500-1:2016] section 18.12).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="queryTable" type="CT_QueryTable"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.42 webExtensions

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_WebExtensions element that specifies a group of CT_WebExtension elements that specify Bindings on the Web Extensions, as specified by [MS-OWEXML] section 1.3, on the **worksheet**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="webExtensions" type="CT_WebExtensions"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.43 connection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_Connection element that specifies the extended properties of an external connection.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="connection" type="CT_Connection"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.44 calculatedMember

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_CalculatedMemberExt

A CT_CalculatedMember (section 2.6.93) element that specifies a definition for a custom member or measure that is applied to a pivot table.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="calculatedMember" type="CT_CalculatedMember"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.45 pivotTableUISettings

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_PivotTableUISettings element that specifies state of the **PivotTable field list** for this PivotTable ([ISO/IEC29500-1:2016] section 18.10).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotTableUISettings" type="CT_PivotTableUISettings"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.46 pivotFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_PivotFilter element that specifies the extended properties of a **filter (PivotTable Advanced Filter)**, as specified in ([ISO/IEC29500-1:2016] section 18.10.1.33). See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotFilter" type="CT_PivotFilter"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.47 slicerCaches

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_SlicerCaches element that specifies a group of slicer cache, as specified in section 2.1.4, identifiers for the **workbook**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicerCaches" type="x14:CT_SlicerCaches"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.48 tableSlicerCache

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_TableSlicerCache element that specifies a table **data source** for the slicer cache.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="tableSlicerCache" type="CT_TableSlicerCache"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.49 timelineCacheRefs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **timelineCacheRefs** element is a **CT_TimelineCacheRefs** type element, as specified in section 2.6.98, that specifies a group of **Timeline Cache** (section 2.3.5.1) identifiers for the **workbook**. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timelineCacheRefs" type="CT_TimelineCacheRefs"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.50 timelineRefs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **timelineRefs** element is a **CT_TimelineRefs** type element, as specified in section 2.6.100, that specifies a list of Timeline (section 2.3.5) part identifiers for the **worksheet**. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timelineRefs" type="CT_TimelineRefs"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.51 timelineCachePivotCaches

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **timelineCachePivotCaches** element is a **CT_PivotCaches** element, as specified in [ISO/IEC29500-4:2016] section A.2 that specifies a list of **PivotTable**, as specified in [ISO/IEC29500-1:2016] section 18.10, **PivotCache** identifier elements. The list of elements specifies the PivotTable **PivotCaches.** This element MUST be associated with a Timeline (section 2.3.5). See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timelineCachePivotCaches" type="x:CT_PivotCaches"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.52 cacheHierarchy

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_CacheHierarchy element that specifies the extended properties of an **OLAP measure**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="cacheHierarchy" type="CT_CacheHierarchy"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.53 slicerCacheHideItemsWithNoData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_SlicerCacheHideNoData element that specifies the extended properties of a slicer cache, as specified in section 2.3.2.1. If this element exists, the non-OLAP slicer items that have no data in its ancestor slicer cache are not displayed and the OLAP slicer items that have no data are not displayed for the **OLAP levels** specified by the **uniqueName** attribute of the CT_SlicerCacheOlapLevelName element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicerCacheHideItemsWithNoData" type="CT_SlicerCacheHideNoData"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.54 timelineStyles

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **timelineStyles** element is a **CT_TimelineStyles** type element, as specified in section 2.6.105, that specifies a group of timeline styles, as specified in section 2.3.5.4. See section 2.2.4.9 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timelineStyles" type="CT_TimelineStyles"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.55 dxfs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **dxfs** element is a **CT_Dxfs** element, as specified in [ISO/IEC29500-4:2016] section A.2, that specifies the list of style differential formats (DXFs), as specified in [ISO/IEC29500-1:2016] section 18.8. See section Styles for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dxfs" type="x:CT_Dxfs"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.56 timelinePivotCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **timelinePivotCacheDefinition** element is a CT_TimelinePivotCacheDefinition element that specifies the extended properties of a PivotTable, as specified in [ISO/IEC29500-1:2016] section

18.10, **PivotCache** definition. See section 2.2.4.6 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timelinePivotCacheDefinition" type="CT_TimelinePivotCacheDefinition"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.57 timelines

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **timelines** element is a **CT_Timelines** type element, as specified in section 2.6.110, that specifies all the Timeline views (section 2.3.5.2), on the **sheet**. This element is the **root element** of the Timelines part (section 2.3.5).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timelines" type="CT_Timelines"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.58 timelineCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **timelineCacheDefinition** element is a **CT_TimelineCacheDefinition** type element, as specified in section 2.6.112, that specifies a Timeline cache (section 2.3.5.1). This element is the **root element** of the Timeline cache part.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timelineCacheDefinition" type="CT_TimelineCacheDefinition"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.59 workbookPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **workbookPr** element is a CT_WorkbookPr (section 2.6.117) element that specifies additional properties for a **workbook**. See section 2.2.4.11 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="workbookPr" type="CT_WorkbookPr"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.60 slicerCachePivotTables

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **CT_SlicerCachePivotTables** element (section 2.6.72) that specifies a group of **CT_SlicerCachePivotTable** elements (section 2.6.73) that specify the PivotTable ([ISO/IEC29500-1:2016] section 18.10) views that are filtered by the slicer cache (section 2.1.4). The PivotTables specified by the **CT_SlicerCachePivotTable** (section 2.6.73) child elements of this element MUST be Non-Worksheet PivotTables (section 2.3.3).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="slicerCachePivotTables" type="x14:CT_SlicerCachePivotTables"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.61 cachedUniqueNames

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_CachedUniqueNames element that specifies the **MDX unique names** for PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache items in this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) cache **field**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="cachedUniqueNames" type="CT_CachedUniqueNames"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.62 dataModel

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_DataModel element that specifies properties of **spreadsheet data model**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dataModel" type="CT_DataModel"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.63 pivotTableData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **pivotTableData** element is a CT_PivotTableData element that specifies the PivotValues of a PivotTable ([ISO/IEC29500-1:2016] section 18.10), specified by the pivotTableReference element in the extension of a **workbook**. See section 2.2.4.5 for how this element integrates with the Office

Open XML file formats specified in [ISO/IEC29500-1:2016]. If the PivotTable ([ISO/IEC29500-1:2016] section 18.10) is not a Non-Worksheet PivotTable, MUST NOT be specified.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotTableData" type="CT_PivotTableData"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.64 pivotCacheIdVersion

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A CT_PivotCacheIdVersion element that specifies the extended properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) **PivotCache Definition**. If this element exists, there MUST be a preceding **CT_PivotCacheDefinition** element and the **pivotCacheId** attribute of the preceding **CT_PivotCacheDefinition** element MUST be equal to one of the following:-

- The **cacheId** attribute of the CT_PivotTableData element in the PivotTable part that specifies a Non-Worksheet PivotTable.

- The **pivotCacheId** attribute of the **CT_TimelineState** (section 2.6.116) child element of a **CT_TimelineCacheDefinition** (section 2.6.112) element that specifies a Timeline cache.

See section 2.2.4.6 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotCacheIdVersion" type="CT_PivotCacheIdVersion"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.65 timeslicer

Target namespace: http://schemas.microsoft.com/office/drawing/2012/timeslicer

A CT_Timeline element that specifies which timeline view is associated with this drawing element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="timeslicer" type="CT_Timeline"/>
```

See section 5.7 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.66 list

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2011/1/ac

An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) element that specifies the first formula in the DataValidation dropdown used for custom or list type data validation. Only used when items need to be quoted.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="list" type="x:ST_Xstring"/>
```

See section 5.6 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.67 absPath

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/ac

A CT_AbsolutePath element that specifies the absolute path to the workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="absPath" type="CT_AbsolutePath"/>
```

See section 5.9 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.68 dataField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **dataField** element is a **CT_DataField** type element, as specified in section 2.6.141, that specifies extended information about a PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, data **field** item. See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dataField" type="CT_DataField"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.69 survey

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A **survey** element is a **CT_Survey** type element, as specified in section 2.6.142, that specifies the properties of a survey associated with a Table ([ISO/IEC29500-1:2016] section 18.5). This element is the **root element** of the Survey part (section 2.1.9)

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="survey" type="CT_Survey"/>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.70 contentPart

Target namespace: http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing

A CT_ContentPart element that specifies a reference to **XML** content.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="contentPart" type="CT_ContentPart"/>
```

See section 5.8 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.71 modelTimeGroupings

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/11/main

A **CT_ModelTimeGroupings** (section 2.6.154) element that specifies the data model time groupings in this workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="modelTimeGroupings" type="CT_ModelTimeGroupings"/>
```

See section 5.10 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.72 revisionPtr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/revision

A CT_RevisionPtr element that specifies metadata supporting runtime scenarios for Microsoft Excel. It MUST be ignored and MUST NOT be saved by all others.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="revisionPtr" type="CT_RevisionPtr"/>
```

See section 5.15 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.73 pivotTableDefinition16

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/pivotdefaultlayout

A CT_PivotTableDefinition16 element that specifies additional properties of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view. See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="pivotTableDefinition16" type="CT_PivotTableDefinition16"/>
```

See section 5.19 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.74 arrayData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

A CT_ArrayData element that specifies arrays in **rich values** called **rich arrays**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="arrayData" type="CT_ArrayData"/>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.75 richStyleSheet

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

A CT_RichStylesheet element that specifies the collection of **dxfs**, as specified in section 2.4.55, **CT_RichFormatProperties**, as specified in section 2.6.167, and **CT_RichStyles**, as specified in section 2.6.172.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="richStyleSheet" type="CT_RichStylesheet"/>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.76 rvb

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

A CT_RichValueBlock element that specifies the index to the **rich value**, as specified in section 2.6.176.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="rvb" type="CT_RichValueBlock"/>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.77 rvData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

A CT_RichValueData element that specifies **rich value data**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="rvData" type="CT_RichValueData"/>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.78 rvStructures

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

A CT_RichValueStructures element that specifies **rich value** structures, which contain lists of **rich value keys** and the **data types** for the corresponding **rich value data**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="rvStructures" type="CT_RichValueStructures"/>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.79 rvTypesInfo

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

A CT_RichValueTypesInfo element that specifies information related to **rich value types**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="rvTypesInfo" type="CT_RichValueTypesInfo"/>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.80 spbStructures

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

A CT_SupportingPropertyBagStructures element that specifies **supporting property bag** structures, which contain lists of **supporting property bag keys** and the **data types** for the corresponding **supporting property bag data**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="spbStructures" type="CT_SupportingPropertyBagStructures"/>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.81 supportingPropertyBags

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

A CT_SupportingPropertyBags element that specifies **supporting property bag data**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="supportingPropertyBags" type="CT_SupportingPropertyBags"/>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.82 calcFeatures

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/calcfeatures

A CT_CalcFeatures element that specifies a list of **CT_CalcFeature** elements (section 2.6.199). These elements add granularity to the version of the calc engine along with the **calcId** ([ISO/IEC29500-1:2016] section 18.2.2).

Each **CT_CalcFeature** element contains the name of a calculation engine feature that was present when the workbook was **calculated**. This is used with the **calcId** to determine the version of the calculation engine. When a workbook is opened, the application will recalculate if the **calcId** value is at least 179016 and any of the features present in the current version of the calculation engine are not represented in this element. See **CalcPr** ([ISO/IEC29500-1:2016] section 18.2.2) for more information about the calculation engine. See **CT_CalcFeature** for a list of calculation engine features.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="calcFeatures" type="CT_CalcFeatures"/>
```

See section 5.22 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.83 filterColumn

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

A CT_RichFilterColumn element that specifies **filter** information associated with **rich values**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="filterColumn" type="CT_RichFilterColumn"/>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.84 richSortCondition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

A CT_RichSortCondition element that specifies **sort conditions** associated with **rich values**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="richSortCondition" type="CT_RichSortCondition"/>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.85 personList

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

A CT_PersonList element that specifies a list of person information associated with a collection of **threaded comments** and **mentions**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="personList" type="CT_PersonList"/>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.86 ThreadedComments

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

A CT_ThreadedComments element that specifies a collection of **threaded comments** on the associated sheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ThreadedComments" type="CT_ThreadedComments"/>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.87 dynamicArrayProperties

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/dynamicarray

A CT_DynamicArrayProperties element that specifies properties of a **dynamic array**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dynamicArrayProperties" type="CT_DynamicArrayProperties"/>
```

See section 5.25 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.88 namedSheetViews

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews

A CT_NamedSheetViews element that specifies a collection of **named sheet views**

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="namedSheetViews" type="CT_NamedSheetViews"/>
```

See section 5.26 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.89 externalLinksPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/extlinksprops

A CT_ExternalLinksPr element that specifies extended properties applicable to all external links of this workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="externalLinksPr" type="CT_ExternalLinksPr"/>
```

See section 5.27 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.90 webImagesSrd

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage

A CT_WebImagesSupportingRichData element that specifies properties for web image rich values. For more information see section 2.3.6.1.10.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="webImagesSrd" type="CT_WebImagesSupportingRichData"/>
```

See section 5.28 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.91 implicitMeasureSupport

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020

A boolean ([XMLSCHEMA2/2] section 3.2.2) element that specifies whether the **data connection** associated with this pivot cache supports the use of measures defined by the client.

Value	Meaning
"true"	The data connection associated with this pivot cache supports client defined measures.
"false"	The data connection associated with this pivot cache does not support client defined measures.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="implicitMeasureSupport" type="xsd:boolean"/>
```

See section 5.29 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.92 refreshIntervals

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh

A CT_RichValueRefreshIntervals element that specifies a collection of refresh intervals for the **rich value type** specified in the **CT_RichValueType** (section 2.6.182).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="refreshIntervals" type="CT_RichValueRefreshIntervals"/>
```

See section 5.31 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.93 dataFieldFutureData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020

A CT_DataFieldFutureData element that specifies extended information about a **PivotTable data field**, as specified in [ISO/IEC29500-1:2016] section 18.10. See section 2.2.4.5 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="dataFieldFutureData" type="CT_DataFieldFutureData"/>
```

See section 5.29 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.4.94 ignorableAfterVersion

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020

A CT_Ignorable element that specifies that the parent element SHOULD be ignored if the CT_PivotCacheIdVersion of the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) **PivotCache** definition is greater than or equal to the value specified.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ignorableAfterVersion" type="CT_Ignorable"/>
```

See section 5.29 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5   Global Attributes

2.5.1   coauthVersionLast

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/revision6

Referenced by: CT_RevisionPtr

An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that SHOULD be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="coauthVersionLast" type="xsd:unsignedInt"/>
```

See section 5.14 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.2 coauthVersionMax

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/revision6

Referenced by: CT_RevisionPtr

An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that SHOULD be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="coauthVersionMax" type="xsd:unsignedInt"/>
```

See section 5.14 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.3 dyDescent

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/ac

The **dyDescent** attribute is a **double** attribute, as specified in [XMLSCHEMA2/2] section 3.2.5, that specifies the vertical distance in **pixels** from the bottom of the **cells** in the current **row** to the typographical baseline of the cell content if, hypothetically, the **zoom level** for the **sheet** containing this row is 100 percent and the cell has bottom-alignment formatting. See section 2.2.4.12 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016]. The **dyDescent** attribute has a side effect; it sets the **customHeight** attribute to true even if the **customHeight** attribute is explicitly set to false.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="dyDescent" type="xsd:double"/>
```

See section 5.5 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.4 formatCode16

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2015/02/main

The **formatCode16** attribute<6> is an ST_Xstring ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the number format codes for this number format. If present, the **formatCode16** attribute takes precedence over the **formatCode** attribute ([ISO/IEC29500-1:2016] section 18.8.31).

The contents of the **formatCode16** attribute are identical to that of the **formatCode** attribute ([ISO/IEC29500-1:2016] section 18.8.31), with the following modifications to the "International Considerations" therein. The syntax for the **formatCode16** attribute's currency and locale/date

system/number system information is `[$<currency string>-<culture info>[,<calendar type and numeral system>]]`.

The currency string is the string to use as a currency symbol.

The culture info is a culture tag, which can be either an IETF language tag ([RFC5646]) or one of the following private use namespace tags.

Value	Meaning
x-sysdate	System long date format. Cannot be combined with other culture tags.
x-systime	System time format. Cannot be combined with other culture tags.
x-euro1	Trailing generic Euro currency. Cannot be combined with other culture tags.
x-euro2	Leading generic Euro currency. Cannot be combined with other culture tags.
x-genlower	Use genitive lowercase form for any full month names in the format (Russian language only). Append to IETF language tag, for example, "ru-RU-x-genlower".
x-genupper	Use genitive uppercase form for any full month names in the format (Russian language only). Append to IETF language tag, for example, "ru-RU-x-genupper".
x-nomlower	Use nominative lowercase form for any full month names in the format (Russian language only). Append to IETF language tag, for example, "ru-RU-x-nomlower".
x-xbt1	Trailing Bitcoin currency. Cannot be combined with other culture tags.
x-xbt2	Leading Bitcoin currency. Cannot be combined with other culture tags.

The optional calendar type and numeral system data is a 16-bit number in hexadecimal form that is placed after a culture tag, separated by a comma. The contents are defined by the **formatCode** attribute ([ISO/IEC29500-1:2016] section 18.8.31), with the following modification: The calendar type is stored in byte 0 (the least significant byte) and the numeral system is stored in byte 1 (the most significant byte).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="formatCode16" type="x:ST_Xstring"/>
```

See section 5.11 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.5 knownFonts

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/ac

The **knownFonts** attribute is a **Boolean** attribute, as specified in ([XMLSCHEMA2/2] section 3.2.2, that specifies the typographical descent information that is stored in the **workbook**. See section 2.2.4.9 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="knownFonts" type="xsd:boolean"/>
```

See section 5.5 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.6 misleadingFormat

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/08/main

A boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from the possibly misleading number formatting of numeric formula results.

Value	Meaning
"true"	Ignore errors arising from the possibly misleading number formatting of numeric formula results.
"false"	Do not ignore errors arising from the possibly misleading number formatting of numeric formula results.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="misleadingFormat" type="xsd:boolean"/>
```

See section 5.24 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.7 uid

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2015/revision2

Referenced by: CT_SparklineGroup

An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier associated with the referencing type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="uid" type="x:ST_Guid"/>
```

See section 5.16 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.8 uid

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/revision3

An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier associated with the referencing type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="uid" type="x:ST_Guid"/>
```

See section 5.17 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.9 uid

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/revision9

An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier associated with the referencing type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="uid" type="x:ST_Guid"/>
```

See section 5.13 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.10 uid

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/revision

Referenced by: CT_DataValidation

An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier associated with the referencing type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="uid" type="x:ST_Guid"/>
```

See section 5.15 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.11 uid

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/revision10

Referenced by: CT_SlicerCacheDefinition, CT_Slicer, CT_Timeline, CT_TimelineCacheDefinition

An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier associated with the referencing type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="uid" type="x:ST_Guid"/>
```

See section 5.12 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.12 uid

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/revision6

An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier associated with the referencing type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="uid" type="x:ST_Guid"/>
```

See section 5.14 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.5.13 uidLastSave

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/revision10

Referenced by: CT_RevisionPtr

An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that SHOULD be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this attribute.

```
<xsd:attribute name="uidLastSave" type="x:ST_Guid"/>
```

See section 5.12 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6   Complex Types

2.6.1   CT_ConditionalFormattings

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: conditionalFormattings

The **CT_ConditionalFormattings** complex type specifies **conditional formatting** information for the **worksheet**.

Child Elements:

conditionalFormatting: A **CT_ConditionalFormatting** element (section 2.6.2) that specifies the conditional formatting properties for a **range**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ConditionalFormattings">
  <xsd:sequence>
    <xsd:element name="conditionalFormatting" type="CT_ConditionalFormatting" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.2   CT_ConditionalFormatting

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_ConditionalFormattings

The **CT_ConditionalFormatting** complex type specifies **conditional formatting** properties for a **range**.

Child Elements:

cfRule: A **CT_CfRule** element (section 2.6.27) that specifies a conditional formatting rule for this range.

xm:sqref: A **sqref** element (section 2.4.5) that specifies the range this conditional formatting applies to.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

pivot: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this conditional formatting is applied only to a **PivotTable**. MUST be a value from the following table.

Value	Meaning
"true"	The area specified by **sqref** only includes cells that are part of a PivotTable data area.
"false"	The area specified by **sqref** includes cells that are not part of a PivotTable data area.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ConditionalFormatting">
  <xsd:sequence>
    <xsd:element name="cfRule" type="CT_CfRule" minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element ref="xm:sqref" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" minOccurs="0" type="x:CT_ExtensionList"/>
  </xsd:sequence>
  <xsd:attribute name="pivot" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.3   CT_DataValidations

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: dataValidations

CT_DataValidations is a complex type that specifies a group of **data validation** items on the **sheet**. MUST contain less than or equal to 65,534 elements. This complex type also specifies data validation properties of a sheet that are used by the application UI.

Child Elements:

dataValidation: A **CT_DataValidation** element (section 2.6.5) that specifies the properties for a single data validation item defined on a **range** of the sheet.

Attributes:

disablePrompts: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether all data validation input prompts are disabled for this sheet.

Value	Meaning
"true"	All data validation input prompts are disabled for this sheet.
"false"	The data validation input prompts are enabled for this sheet.

xWindow: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the x-coordinate, relative to the application window, of the upper-left corner of the data validation input prompt, measured in pixels. This value MUST be less than or equal to 65,535. <7>

yWindow: An **unsignedInt** attribute that specifies the y-coordinate, relative to the application window, of the upper-left corner of the data validation input prompt, measured in pixels. This value MUST be less than or equal to 65,535. <8>

count: An **unsignedInt** attribute that specifies the number of **dataValidation** child elements of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataValidations">
  <xsd:sequence>
    <xsd:element name="dataValidation" type="CT DataValidation" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="disablePrompts" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="xWindow" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="yWindow" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.4 CT_DataValidationFormula

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_DataValidation

CT_DataValidationFormula is a complex type that specifies a **formula** used in **data validation**.

Child Elements:

xm:f: An **f** element (section 2.4.3) that specifies a formula for the data validation. The formula MUST adhere to the grammar provided in section 2.2.2, with the following restrictions:

- MUST NOT use the ref-infix-operator, local-cell-reference, bang-reference, bang-name, array-constant, sheet-range-reference, or structure-reference production rules.

- MUST be an external-cell-reference if used by the **formula1** element of the ancestor **CT_DataValidation** element (section 2.6.5), and the **formula1** element of the ancestor **CT_DataValidation** element uses the external-cell-reference production rule, and the **type** attribute of the ancestor **CT_DataValidation** element is "list".

- MUST NOT be an external-cell-reference that references more than one cell if used by the **formula1** element of the ancestor **CT_DataValidation** element and the **type** attribute of the ancestor **CT_DataValidation** element is not "list".

- MUST NOT be an external-cell-reference that references more than one cell if used by the **formula2** element of the ancestor **CT_DataValidation** element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataValidationFormula">
  <xsd:sequence>
    <xsd:element ref="xm:f" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.5 CT_DataValidation

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_DataValidations

CT_DataValidation is a complex type that specifies **data validation** for a **range** on this **sheet**.

Child Elements:

formula1: A **CT_DataValidationFormula** element (section 2.6.4) that specifies the first **formula** for the data validation.

- If **operator** is "between" or "notBetween" and **type** is not "custom", "list", or "none", this formula is used as the lesser of two bounding values and MUST exist.

- If **operator** is not "between" or "notBetween", or **type** is "custom", this formula is the only formula and MUST exist.

- If **operator** is not "between" or "notBetween", or **type** is "custom" or "list", either formula is the only formula and MUST exist or **CT_DataValidation** MUST have a **list** (section 2.4.66) child element.

- If the **type** is "none", this formula MUST NOT exist.

formula2: A **CT_DataValidationFormula** element that specifies the second formula for the data validation.

- If **operator** is "between" or "notBetween" and **type** is not "custom", "list", or "none", this formula is used as the greater of two bounding values and MUST exist.

- If **operator** is not "between" or "notBetween", or **type** is "custom", "list", or "none", this formula MUST NOT exist.

xm:sqref: A **sqref** element (section 2.4.5) that specifies ranges to which data validation is applied.

Attributes:

type: An **ST_DataValidationType** ([ISO/IEC29500-1:2016] section 18.18.21) attribute that specifies the type of data validation.

errorStyle: An **ST_DataValidationErrorStyle** ([ISO/IEC29500-1:2016] section 18.18.18) attribute that specifies the style of error alert used for this data validation.

imeMode: An **ST_DataValidationImeMode** ([ISO/IEC29500-1:2016] section 18.18.19) attribute that specifies the **Input Method Editor (IME)** mode enforced by this data validation.

operator: An **ST_DataValidationOperator** ([ISO/IEC29500-1:2016] section 18.18.20) attribute that specifies the relational operator used with this data validation. If **type** is "custom", "list", or "none", the value of the **operator** attribute is undefined and MUST be ignored.

allowBlank: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the data validation treats empty or blank entries as valid.

Value	Meaning
"true"	The data validation treats empty or blank entries as valid.
"false"	The data validation treats empty or blank entries as invalid.

showDropDown: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to display the drop-down combo box for a list type data validation.

Value of showDropDown	Value of type	Meaning
"true"	list	Displays the drop-down combo box.
"false"	list	Suppresses the drop-down combo box.

showInputMessage: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to display the input prompt message.

Value	Meaning
"true"	Display the input prompt message.
"false"	Suppress the input prompt message.

showErrorMessage: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to display the error alert message.

Value	Meaning
"true"	Display the error alert message.
"false"	Suppress the error alert message.

errorTitle: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the text of the title bar of the error alert. The length of this string MUST be less than or equal to 32 characters.

error: An **ST_Xstring** attribute that specifies the message text of the error alert. The length of this string MUST be less than or equal to 225 characters.

promptTitle: An **ST_Xstring** attribute that specifies the text of the title bar of the input prompt. The length of this string MUST be less than or equal to 32 characters.

prompt: An **ST_Xstring** attribute that specifies the message text of the input prompt. This string MUST be less than or equal to 255 characters.

xr:uid: An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier associated with this data validation rule

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataValidation">
  <xsd:sequence>
    <xsd:element name="formula1" type="CT_DataValidationFormula" minOccurs="0"
maxOccurs="1"/>
    <xsd:element name="formula2" type="CT_DataValidationFormula" minOccurs="0"
maxOccurs="1"/>
    <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="type" type="x:ST_DataValidationType" use="optional" default="none"/>
  <xsd:attribute name="errorStyle" type="x:ST_DataValidationErrorStyle" use="optional"
default="stop"/>
  <xsd:attribute name="imeMode" type="x:ST_DataValidationImeMode" use="optional"
default="noControl"/>
  <xsd:attribute name="operator" type="x:ST_DataValidationOperator" use="optional"
default="between"/>
  <xsd:attribute name="allowBlank" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="showDropDown" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="showInputMessage" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="showErrorMessage" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="errorTitle" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="error" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="promptTitle" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="prompt" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute ref="xr:uid"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.6 CT_SparklineGroups

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: sparklineGroups

CT_SparklineGroups is a complex type that specifies the groups of **sparklines** on the **sheet**. MUST contain fewer than 2^{31} elements.

Child Elements:

sparklineGroup: A **CT_SparklineGroup** element (section 2.6.7) that specifies properties for a single sparkline group.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SparklineGroups">
  <xsd:sequence>
    <xsd:element name="sparklineGroup" type="CT_SparklineGroup" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
```

```
        </xsd:complexType>
```

See section [5.4](#) for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.7 CT_SparklineGroup

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: [CT_SparklineGroups](#)

CT_SparklineGroup is a complex type that specifies properties for a **sparkline** group.

Child Elements:

colorSeries: A **CT_Color** ([ISO/IEC29500-4:2016] section A.2) element that specifies the color for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

colorNegative: A **CT_Color** element that specifies the color of the negative **data points** for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

colorAxis: A **CT_Color** element that specifies the color of the horizontal axis for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

colorMarkers: A **CT_Color** element that specifies the color of the **data markers** for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

colorFirst: A **CT_Color** element that specifies the color of the first data point for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

colorLast: A **CT_Color** element that specifies the color of the last data point for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

colorHigh: A **CT_Color** element that specifies the color of the highest data point for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

colorLow: A **CT_Color** element that specifies the color of the lowest data point for each sparkline in this sparkline group. The **auto** attribute of the **CT_Color** element MUST NOT exist.

xm:f: An **f** element (section [2.4.3](#)) that specifies the date **range** for the sparkline group. The syntax, as specified in section [2.2.2](#), for this **f** element is the following:

```
    sparklinegroup-formula = single-sheet-area / [single-sheet-prefix / book-prefix] name
```

Additionally, if a single-sheet-area is specified, that single-sheet-area MUST contain **cells** from either a single **row** or a single **column**.

sparklines: A **CT_Sparklines** element (section [2.6.8](#)) that specifies properties for individual sparklines.

Attributes:

manualMax: A **double** ([XMLSCHEMA2/2] section 3.2.5) attribute that specifies the maximum for the vertical axis that is shared across all sparklines in this sparkline group. This attribute MUST NOT exist if **maxAxisType** does not equal "custom".

manualMin: A **double** attribute that specifies the minimum for the vertical axis that is shared across all sparklines in this sparkline group. This attribute MUST NOT exist if **minAxisType** does not equal "custom".

lineWeight: A **double** attribute that specifies the line weight for each sparkline in the sparkline group, where the line weight is measured in **points**. MUST be greater than or equal to zero, and MUST be less than or equal to 1584.

type: An **ST_SparklineType** attribute (section 2.7.5) that specifies the type of the sparkline group.

dateAxis: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this sparkline group uses a date axis.

Value of dateAxis	Meaning
"false"	No date axis is specified for this sparkline group.
"true"	A date axis is specified for this sparkline group.

displayEmptyCellsAs: An **ST_DispBlanksAs** attribute (section 2.7.3) that specifies how empty cells are plotted.

markers: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether data markers are displayed for each sparkline in this sparkline group.

Value	Meaning
"true"	Data markers are displayed for each sparkline in this sparkline group.
"false"	No data marker is displayed for sparkline in this sparkline group.

high: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the data points with the highest value are formatted differently for each sparkline in this sparkline group.

Value	Meaning
"true"	Data points with the highest value are formatted differently for each sparkline in this sparkline group.
"false"	No data point with the highest value is formatted for sparkline in this sparkline group.

low: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the data points with the lowest value are formatted differently for each sparkline in this sparkline group.

Value	Meaning
"true"	Data points with the lowest value are formatted differently for each sparkline in this sparkline group.
"false"	No data point with the lowest value is formatted for sparkline in this sparkline group.

first: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the first data point is formatted differently for each sparkline in this sparkline group.

Value	Meaning
"true"	The first data point is formatted differently for each sparkline in this sparkline group.

Value	Meaning
"false"	The first data point is not formatted for sparkline in this sparkline group.

last: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the last data point is formatted differently for each sparkline in this sparkline group.

Value	Meaning
"true"	The last data point is formatted differently for each sparkline in this sparkline group.
"false"	The last data point is not formatted for sparkline in this sparkline group.

negative: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the negative data points are formatted differently for each sparkline in this sparkline group.

Value	Meaning
"true"	The negative data point is formatted differently for each sparkline in this sparkline group.
"false"	The negative data point is not formatted for sparkline in this sparkline group.

displayXAxis: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the horizontal axis is displayed for each sparkline in this sparkline group.

Value	Meaning
"true"	The horizontal axis is displayed for each sparkline in this sparkline group.
"false"	No horizontal axis is displayed for sparkline in this sparkline group.

displayHidden: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether data in **hidden** cells are plotted for the sparklines in this sparkline group.

Value	Meaning
"true"	Data in hidden cells are plotted for the sparklines in this sparkline group.
"false"	Data in hidden cells are not plotted for the sparklines in this sparkline group.

minAxisType: An **ST_SparklineAxisMinMax** attribute (section 2.7.4) that specifies how the vertical axis minimums for the sparklines in this sparkline group are calculated.

maxAxisType: An **ST_SparklineAxisMinMax** attribute that specifies how the vertical axis maximums for the sparklines in this sparkline group are calculated.

rightToLeft: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether each sparkline in the sparkline group is displayed in a **right-to-left** manner.

Value	Meaning
"true"	Each sparkline in the sparkline group is displayed in a right-to-left manner.
"false"	Not all sparklines in the sparkline group is displayed in a right-to-left manner.

xr2:uid: An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the sparkline group. If any instance of this type specifies this attribute, then all instances MUST specify it, and the values MUST be distinct.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SparklineGroup">
  <xsd:sequence>
    <xsd:element name="colorSeries" minOccurs="0" maxOccurs="1" type="x:CT Color"/>
    <xsd:element name="colorNegative" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
    <xsd:element name="colorAxis" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
    <xsd:element name="colorMarkers" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
    <xsd:element name="colorFirst" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
    <xsd:element name="colorLast" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
    <xsd:element name="colorHigh" minOccurs="0" maxOccurs="1" type="x:CT Color"/>
    <xsd:element name="colorLow" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
    <xsd:element ref="xm:f" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="sparklines" type="CT_Sparklines" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="manualMax" type="xsd:double" use="optional"/>
  <xsd:attribute name="manualMin" type="xsd:double" use="optional"/>
  <xsd:attribute name="lineWeight" type="xsd:double" use="optional" default="0.75"/>
  <xsd:attribute name="type" type="ST_SparklineType" use="optional" default="line"/>
  <xsd:attribute name="dateAxis" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="displayEmptyCellsAs" type="ST_DispBlanksAs" use="optional"
default="zero"/>
  <xsd:attribute name="markers" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="high" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="low" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="first" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="last" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="negative" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="displayXAxis" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="displayHidden" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="minAxisType" type="ST_SparklineAxisMinMax" use="optional"
default="individual"/>
  <xsd:attribute name="maxAxisType" type="ST_SparklineAxisMinMax" use="optional"
default="individual"/>
  <xsd:attribute name="rightToLeft" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute ref="xr2:uid"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.8   CT_Sparklines

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SparklineGroup

CT_Sparklines is a complex type that specifies a list of individual **sparklines** in a sparkline group. MUST contain fewer than 2^{31} elements.

Child Elements:

sparkline: A **CT_Sparkline** element (section 2.6.9) that specifies properties for an individual sparkline.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT Sparklines">
  <xsd:sequence>
    <xsd:element name="sparkline" type="CT Sparkline" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.9   CT_Sparkline

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_Sparklines

CT_Sparkline is a complex type that specifies information for a single **sparkline**.

Child Elements:

xm:f: An **f** element (section 2.4.3) that specifies the data **range** for this sparkline. The syntax, specified in section 2.2.2, for this element is the following:

```
sparkline-formula = single-sheet-area / [single-sheet-prefix / book-prefix] name
```

Additionally, if a single-sheet-area is specified, that single-sheet-area MUST contain **cells** from either a single **row** or a single **column**.

xm:sqref: A **sqref** element (section 2.4.5) that specifies the cell in which the sparkline is located. This **sqref** element MUST contain exactly one **ref** element (section 2.4.4) that MUST specify exactly one cell.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Sparkline">
  <xsd:sequence>
    <xsd:element ref="xm:f" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.10 CT_WorkbookPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: workbookPr

CT_WorkbookPr is a complex type that specifies additional properties for a **workbook**.

Attributes:

defaultImageDpi: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the resolution in which images in the workbook is saved, in DPI ([ISO/IEC29500-1:2016] section 18.2.24), when the **autoCompressPictures** attribute of the **WorkbookPr** ([ISO/IEC29500-1:2016] section 18.2.28) element is "true" and the **CT_UseLocalDpi** ([MS-ODRAWXML] section 2.3.1.13) element of the drawings part ([ISO/IEC29500-1:2016] section 12.3.8) corresponding to the image being saved is "false". MUST be equal to "96", "150", or "220".

discardImageEditData: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether all **CT_Photo** ([MS-ODRAWXML] section 2.3.1.9) elements and cropped out areas of images in the workbook are not saved.

Value	Meaning
"true"	All **CT_Photo** elements and cropped out areas of images in the workbook are not saved.
"false"	All **CT_Photo** elements and cropped out areas of images in the workbook are saved.

accuracyVersion: An **unsignedInt** attribute that specifies how functions are calculated in the workbook. SHOULD be equal to zero ("0").<9>

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_WorkbookPr">
  <xsd:attribute name="defaultImageDpi" type="xsd:unsignedInt" default="220"/>
  <xsd:attribute name="discardImageEditData" type="xsd:boolean" default="false"/>
  <xsd:attribute name="accuracyVersion" type="xsd:unsignedInt" default="0"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.11 CT_SlicerRefs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: slicerList

CT_SlicerRefs is a complex type that specifies a list of slicer (section 2.3.2) part identifiers for the **worksheet**. MUST contain exactly one slicer part identifier.

Child Elements:

slicer: A **CT_SlicerRef** element (section 2.6.12) that specifies the slicer part identifier for the worksheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerRefs">
  <xsd:sequence>
    <xsd:element name="slicer" type="CT_SlicerRef" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.12 CT_SlicerRef

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerRefs

A complex type that specifies a relationship identifier of the part that contains the slicers in this **worksheet**.

Attributes:

r:id: An **ST_RelationshipId** ([ISO/IEC29500-1:2016] section 22.8.2.1) attribute that specifies a relationship identifier of the part that contains the slicers in this worksheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT SlicerRef">
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.13 CT_SlicerCaches

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: slicerCaches, slicerCaches

A complex type that specifies a list of slicer cache part identifiers for the **workbook**. MUST contain fewer than 2^{31} elements.

Child Elements:

slicerCache: A **CT_SlicerCache** element that specifies a slicer cache part identifier in this workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerCaches">
  <xsd:sequence>
    <xsd:element name="slicerCache" type="CT SlicerCache" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.14 CT_SlicerCache

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerCaches

A complex type that specifies a relationship identifier to a slicer cache part in this **workbook**.

Attributes:

r:id: An **ST_RelationshipId** ([ISO/IEC29500-1:2016] section 22.8.2.1) attribute that specifies a relationship identifier to a slicer cache part in this workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT SlicerCache">
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.15 CT_CalculatedMember

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: calculatedMember

A complex type that specifies extended properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) OLAP calculated member.

Child Elements:

tupleSet: A **CT_TupleSet** element (section 2.6.16) that specifies **OLAP tuples** within this **OLAP named set**.

Attributes:

displayFolder: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the display folder of this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set. The length of this value MUST be less than 65,536 characters. This attribute MUST NOT exist if the **set** attribute in the ancestor **CT_CalculatedMember** ([ISO/IEC29500-4:2016] section A.2) element is zero ("0").

flattenHierarchies: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to display members from different **OLAP levels** of the same PivotTable cache hierarchy of this **PivotTable** named set in the same **PivotTable field**. This attribute MUST NOT exist if the **set** attribute in the ancestor **CT_CalculatedMember** element is zero ("0").

Value	Meaning
"0"	Each member from a different level of the same PivotTable cache hierarchy of this **PivotTable** named set is displayed in a separate **PivotTable** field.
"1"	All members from different levels of the same PivotTable cache hierarchy of this **PivotTable** named set are displayed in the same **PivotTable** field.

dynamicSet: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this **PivotTable** named set is a dynamic OLAP named set. This attribute MUST NOT exist if the **set** attribute in the ancestor **CT_CalculatedMember** element is zero ("0").

Value	Meaning
"0"	This **PivotTable** named set is a static OLAP named set.
"1"	This **PivotTable** named set is a dynamic OLAP

Value	Meaning
	named set.

hierarchizeDistinct: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to automatically order and remove duplicates from this **PivotTable** named set. This attribute MUST NOT exist if the **set** attribute in the ancestor **CT_CalculatedMember** element is zero ("0").

Value	Meaning
"0"	Do not automatically order and remove duplicates from this **PivotTable** named set.
"1"	Automatically order and remove duplicates from this **PivotTable** named set.

mdxLong: An **ST_Xstring** attribute that specifies **Multidimensional Expressions (MDX)** of the PivotTable OLAP calculated member. The length of this attribute MUST be zero or it MUST be greater than 32,767 characters and less than 1,073,741,823 characters. If this value is greater than 32,767 characters, the length of the **mdx** attribute in the ancestor **CT_CalculatedMember** element MUST be "1" and the first character of the **mdx** attribute MUST be equal to " ", the space character (0x0020).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CalculatedMember">
  <xsd:sequence>
    <xsd:element name="tupleSet" minOccurs="0" maxOccurs="1" type="CT_TupleSet"/>
  </xsd:sequence>
  <xsd:attribute name="displayFolder" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="flattenHierarchies" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="dynamicSet" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="hierarchizeDistinct" type="xsd:boolean" use="optional"
default="true"/>
  <xsd:attribute name="mdxLong" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.16 CT_TupleSet

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CalculatedMember

A complex type that specifies an **OLAP named set**.

Child Elements:

headers: A **CT_TupleSetHeaders** element that specifies the **MDX unique names** of the **OLAP hierarchies** and the MDX unique names of the **OLAP levels** specified by this OLAP named set.

rows: A **CT_TupleSetRows** element that specifies the **OLAP tuples** specified by this OLAP named set.

Attributes:

rowCount: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of OLAP tuples specified by this OLAP named set. MUST equal the number of **CT_TupleSetRow** elements within the **rows** element. **rowCount** * **columnCount** MUST be less than or equal to 3,000.

columnCount: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of MDX unique names of the **OLAP hierarchies** and the MDX unique names of the OLAP levels specified by this OLAP named set. MUST equal the number of **CT_TupleSetHeader** elements within the **headers** element. **rowCount** * **columnCount** MUST be less than or equal to 3,000.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TupleSet">
  <xsd:sequence>
    <xsd:element name="headers" type="CT_TupleSetHeaders" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="rows" type="CT_TupleSetRows" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="rowCount" type="xsd:unsignedInt" use="optional" default="1"/>
  <xsd:attribute name="columnCount" type="xsd:unsignedInt" use="optional" default="1"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.17 CT_TupleSetHeaders

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TupleSet

A complex type that specifies the **MDX unique names** of the **OLAP hierarchies** and the MDX unique names of the **OLAP levels** of the **OLAP named set**.

Child Elements:

header: CT_TupleSetHeader elements that specify the MDX unique names of the OLAP hierarchies and the MDX unique names of the OLAP levels of the OLAP named set. The number of these elements MUST be equal to the value of the **columnCount** attribute in the **CT_TupleSet** element that is the ancestor of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TupleSetHeaders">
  <xsd:sequence>
    <xsd:element name="header" type="CT_TupleSetHeader" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.18 CT_TupleSetHeader

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TupleSetHeaders

A complex type that specifies the **MDX unique name** of the **OLAP hierarchy** and the MDX unique name of the **OLAP level** of the OLAP named set that is specified by the **CT_TupleSet** element that is an ancestor of this element.

Attributes:

uniqueName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the MDX unique name of the OLAP level. MUST be less than or equal to 65,535 characters in length.

hierarchyName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the MDX unique name of the OLAP hierarchy. MUST be less than or equal to 65,535 characters in length.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TupleSetHeader">
  <xsd:attribute name="uniqueName" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="hierarchyName" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.19 CT_TupleSetRows

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TupleSet

A complex type that specifies the **OLAP tuples** for this **OLAP named set**.

Child Elements:

row: CT_TupleSetRow elements that specify the OLAP tuples for this OLAP named set. The number of these elements MUST be equal to the value of the **rowCount** attribute in the parent **CT_TupleSet** element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TupleSetRows">
  <xsd:sequence>
    <xsd:element name="row" type="CT_TupleSetRow" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.20 CT_TupleSetRow

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TupleSetRows

A complex type that specifies an **OLAP tuple** for this **OLAP named set**.

Child Elements:

rowItem: CT_TupleSetRowItem elements that specify the **OLAP members** that are part of the OLAP tuple that is specified by this **CT_TupleSetRow** element. The number of these elements MUST be equal to value of the **columnCount** attribute in the **CT_TupleSet** element that is an ancestor of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TupleSetRow">
  <xsd:sequence>
    <xsd:element name="rowItem" type="CT_TupleSetRowItem" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.21 CT_TupleSetRowItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TupleSetRow

A complex type that specifies an **OLAP member** that is part of an **OLAP tuple**.

Attributes:

u: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **MDX unique name** of this OLAP member. MUST be less than or equal to 65,535 characters in length.

d: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies a display name for this OLAP member. MUST be less than or equal to 65,535 characters in length.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TupleSetRowItem">
  <xsd:attribute name="u" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="d" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.22 CT_SetLevels

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CacheHierarchy

A complex type that specifies a list of **CT_SetLevel** elements that specify the **OLAP levels** of the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set.

Child Elements:

setLevel: A **CT_SetLevel** element that specifies an OLAP level of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache hierarchy of the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of child **setLevel** elements of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SetLevels">
  <xsd:sequence>
    <xsd:element name="setLevel" minOccurs="1" maxOccurs="unbounded" type="CT_SetLevel"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.23 CT_SetLevel

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SetLevels

A complex type that specifies an **OLAP level** of the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) cache hierarchy of a **PivotTable** named set.

Attributes:

hierarchy: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies a reference to the PivotTable cache hierarchy. MUST be a value from the following table.

Value	Meaning
"-2"	The PivotTable measure cache hierarchy is used.
"-1"	No PivotTable cache hierarchy is used.
Greater than or equal to zero	A zero-based PivotTable cache hierarchy index. The referenced **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) element specifies the PivotTable cache hierarchy that is used. MUST be less than the number of **CT_CacheHierarchy** elements within the **CT_CacheHierarchies** ([ISO/IEC29500-1:2016] section 18.10) element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SetLevel">
  <xsd:attribute name="hierarchy" use="required" type="xsd:int"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.24 CT_CacheHierarchy

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: cacheHierarchy

This complex type specifies the extended properties of a **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set. When an element of this type is present, the **set** attribute of the ancestor **cacheHierarchy** element of type **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) MUST be "true".

Child Elements:

setLevels: A **CT_SetLevels** element that specifies the **OLAP levels** of the hierarchy that is used by this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set.

Attributes:

flattenHierarchies: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to display members from different levels of the same PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache hierarchy of this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set in the same **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) **field**. MUST be "false" if **ignore** is "true". If a **CT_CalculatedMember** element that corresponds to the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set exists, this attribute MUST be equal to the **flattenHierarchies** attribute of the **CT_CalculatedMember** element.

ignore	flattenHierarchies	Meaning
"true"	"false"	The ancestor **cacheHierarchy** element of type **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) of this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set is discarded.
"false"	"false"	Each member from a different level of the same PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache hierarchy of this PivotTable ([ISO/IEC29500-1:2016] section 18.10) named set is displayed in a separate PivotTable ([ISO/IEC29500-1:2016] section 18.10) field.
"false"	"true"	All members from different levels of the same PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache hierarchy of this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set are displayed in the same **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) field.

measuresSet: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set contains one or more PivotTable ([ISO/IEC29500-1:2016] section 18.10) measure cache hierarchies. MUST be "false" if **ignore** is "true".

ignore	measureSet	Meaning
"true"	"false"	The ancestor **cacheHierarchy** element of type **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) of this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set is discarded.
"false"	"false"	The **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set does not contain PivotTable ([ISO/IEC29500-1:2016] section 18.10) measure cache hierarchies.
"false"	"true"	The **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set contains PivotTable ([ISO/IEC29500-1:2016] section 18.10) measure cache hierarchies.

hierarchizeDistinct: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to automatically order and remove duplicates from this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set. MUST be "false" if **ignore** is "true". If a **CT_CalculatedMember** element that corresponds to the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set exists, this attribute MUST be equal to **hierarchizeDistinct** attribute of the **CT_CalculatedMember** element.

ignore	hierarchizeDistinct	Meaning
"true"	"false"	The ancestor **cacheHierarchy** element of type **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) of this PivotTable ([ISO/IEC29500-1:2016] section 18.10) named set is discarded.
"false"	"false"	Do not automatically order and remove duplicates from this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set.
"false"	"true"	Automatically order and remove duplicates from this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named set.

ignore: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the ancestor **cacheHierarchy** element of type **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) SHOULD<10> be discarded. If **ignore** is "true", the ancestor **cacheHierarchy** element of type **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) MUST have the following attribute values:

Field	Value
measure	"true"

Field	Value
set	"false"
attribute	"false"
measures	"false"
oneField	"false"
time	"false"
keyAttribute	"false"
memberValueDatatype	MUST NOT be specified.
unbalanced	MUST NOT be specified.
unbalancedGroup	MUST NOT be specified.
hidden	"false"
count	"0"
parentSet	MUST NOT be specified.
dimensionUniqueName	MUST NOT be specified.
defaultMemberUniqueName	MUST NOT be specified.
allUniqueName	MUST NOT be specified.
allCaption	MUST NOT be specified.
displayFolder	MUST NOT be specified.
measureGroup	MUST NOT be specified.
uniqueName	"Dummy*N*", where *N* is the text string representing in decimal form the zero-based index of the ancestor **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) element within the group of **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) elements that have a descendent **CT_CacheHierarchy** element with the **ignore** attribute equal to "true".

Within the **CT_CacheHierarchies** ([ISO/IEC29500-4:2016] section A.2) element, all **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) elements that have a **descendant** **CT_CacheHierarchy** element with the **ignore** attribute equal to "true" MUST follow all other **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) elements without a descendent **CT_CacheHierarchy** element or with a descendent **CT_CacheHierarchy** element with the **ignore** attribute equal to "false".

If this attribute is "true", there MUST exist a **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element with an **fld** attribute equal to the zero-based index of a **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) element in the list of **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) elements specified by **CT_CacheFields** ([ISO/IEC29500-4:2016] section A.2) with a **hierarchy** attribute that specifies the ancestor **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2). Additionally, that **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element MUST have a descendant **CT_DataField** element with a **sourceField** attribute specified.

For more details, see CT_DataField.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CacheHierarchy">
  <xsd:sequence>
    <xsd:element name="setLevels" minOccurs="0" maxOccurs="1" type="CT SetLevels"/>
  </xsd:sequence>
  <xsd:attribute name="flattenHierarchies" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="measuresSet" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="hierarchizeDistinct" type="xsd:boolean" use="optional"
default="true"/>
  <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.25 CT_DataField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: dataField

This complex type specifies extended information about a **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) data **field** item ([ISO/IEC29500-1:2016] section 18.10.1.22).

Attributes:

pivotShowAs: An **ST_PivotShowAs** attribute that specifies the data display format for this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) data field item. If this attribute is specified, the **showDataAs** attribute of the ancestor **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element MUST NOT be specified. If this attribute is equal to "percentOfParent", "percentOfRunningTotal", "rankAscending", or "rankDescending", the **baseField** attribute of the ancestor **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element MUST be greater than or equal to 0.

sourceField: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the zero-based index of the **CT_PivotField** ([ISO/IEC29500-4:2016] section A.2) element in the list of **CT_PivotField** ([ISO/IEC29500-4:2016] section A.2) elements specified by the **CT_PivotFields** ([ISO/IEC29500-4:2016] section A.2) element that this data item summarizes.

If an **OLAP measure** is summarized in a PivotTable ([ISO/IEC29500-1:2016] section 18.10) as a data field item ([ISO/IEC29500-1:2016] section 18.10.1.22) more than one time, data field items ([ISO/IEC29500-1:2016] section 18.10.1.22) that specify that OLAP measure after the first data field item ([ISO/IEC29500-1:2016] section 18.10.1.22) that specifies that OLAP measure MUST have a **descendant** **CT_DataField** element with a **sourceField** specified.

If this attribute is specified, the **CT_PivotField** ([ISO/IEC29500-4:2016] section A.2) element specified by the **fld** attribute of the ancestor **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element MUST have a descendant **CT_PivotField** element with an **ignore** attribute equal to "true".

If this attribute is specified, the **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) element with a zero-based index in the list of **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) elements specified by the **CT_CacheFields** ([ISO/IEC29500-4:2016] section A.2) element equal to the **fld** attribute of the ancestor **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element that exists in the Pivot Table Cache Definition part ([ISO/IEC29500-1:2016] section 12.3.12) specified by the **cacheId** attribute of the **CT_PivotTableDefinition** ([ISO/IEC29500-4:2016] section A.2) element that is the ancestor of this element MUST have a descendant **CT_CacheField** element. The **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) element specified by the **hierarchy** attribute of that **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) element MUST have a descendent **CT_CacheHierarchy** element with an **ignore** attribute equal to "true". The

CT_PivotHierarchy ([ISO/IEC29500-4:2016] section A.2) element with a zero-based index in the list of **CT_PivotHierarchy** ([ISO/IEC29500-4:2016] section A.2) elements specified by the **CT_PivotHierarchies** ([ISO/IEC29500-4:2016] section A.2) element in this part that is equal to the zero-based index of that **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) element in the list of **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) elements specified by the **CT_CacheHierarchies** ([ISO/IEC29500-4:2016] section A.2) element MUST have a descendant **CT_PivotHierarchy** element.

If this attribute is specified, the **fld** attribute of the ancestor **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element SHOULD<11> be ignored.

This attribute MUST NOT be specified for non-**OLAP** PivotTables ([ISO/IEC29500-1:2016] section 18.10).

uniqueName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the unique name for duplicated OLAP measures. MUST be unique within this part. MUST be less than or equal to 65,535 characters in length.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataField">
  <xsd:attribute name="pivotShowAs" type="ST_PivotShowAs" use="optional"/>
  <xsd:attribute name="sourceField" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="uniqueName" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.26 CT_Cfvo

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_ColorScale, CT_DataBar, CT_IconSet

This complex type specifies a Conditional Formatting Value Object (CFVO) that specifies how to calculate a value from the **range** of cells to which a **conditional formatting** rule applies.

Child Elements:

xm:f: An **f** element that specifies the formula that is evaluated and compared to the **cell value** by the comparison method specified by **gte**. The formula MUST adhere to the grammar provided in Formulas, with the following restrictions:

- MUST NOT use the ref-infix-operator, book-prefix, local-cell-reference, bang-reference, bang-name, array-constant, sheet-range-reference or structure-reference production rules.

- MUST NOT use the A1-relative-column production rule except from the A1-absolute-column production rule, and it MUST NOT use the A1-relative-row production rule except from the A1-absolute-row production rule.

- MUST NOT match the single-sheet-area production rule.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

type: An **ST_CfvoType** attribute that specifies how the CFVO value is determined:

- If this **CT_Cfvo** element is a child of a **CT_ColorScale** and specifies the beginning of the **color scale**, this attribute MUST NOT be max.

- If this **CT_Cfvo** element is a child of a **CT_ColorScale** and specifies the end of the color scale, this attribute MUST NOT be min.

- If this **CT_Cfvo** element is a child of a **CT_ColorScale** and specifies the midpoint of the color scale, this attribute MUST NOT be max and MUST NOT be min.

- If this **CT_Cfvo** element is a child of a **CT_DataBar** and specifies the cell value for the min length of the **data bar**, this attribute MUST NOT be max or autoMax.

- If this **CT_Cfvo** element is a child of a **CT_DataBar** and specifies the cell value for the max length of the data bar, this attribute MUST NOT be min or autoMin.

- If this **CT_Cfvo** element is not a child of a **CT_DataBar**, this attribute MUST NOT be autoMin and MUST NOT be autoMax.

- If this **CT_Cfvo** element is a child of a **CT_IconSet** record, this value MUST NOT be max or min.

- If the value is max, min, autoMax, or autoMin, **f** MUST NOT be present.

gte: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **CT_Cfvo** will use greater-than or greater-than-or-equal-to when applying conditional formatting rules. If this **CT_Cfvo** element is a child of something other than a **CT_IconSet** element, this attribute MUST NOT be present. The value of this attribute is interpreted as follows:

Value	Meaning
"false"	Greater-than is used when applying conditional formatting rules.
"true"	Greater-than-or-equal-to is used when applying conditional formatting rules.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Cfvo">
  <xsd:sequence>
    <xsd:element ref="xm:f" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="type" type="ST_CfvoType" use="required"/>
  <xsd:attribute name="gte" type="xsd:boolean" use="optional" default="true"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.27 CT_CfRule

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_ConditionalFormatting

This complex type specifies a **conditional formatting** rule for a **range**.

Child Elements:

xm:f: f elements that specify the **formulas** in the conditional formatting rule. The formulas MUST adhere to the grammar specified in Formulas, with the following restrictions:

- The formula MUST NOT conform to the ref-infix-operator, book-prefix, local-cell-reference, array-constant, bang-reference, bang-name, sheet-range-reference, or structure-reference production rules.

- The formula MUST NOT match the single-sheet-area production rule.

The following table explains how to interpret the formulas.

Value of type	Interpretation of the formulas in f
cellIs	**f** elements that specify the formulas, numeric values, or **cell** references that specify the operands for the **ST_ConditionalFormattingOperator** ([ISO/IEC29500-1:2016] section 18.18.15) specified by **operator**. If **operator** is "between" or "notBetween", **f** MUST contain two formulas; otherwise, **f** MUST contain one formula.
expression	An **f** element that specifies a formula. When the formula returns zero, conditional formatting is not displayed. When the formula returns a nonzero value, conditional formatting is displayed.
colorScale, dataBar, iconSet	An **f** element that specifies a formula. When the formula returns zero, conditional formatting is not displayed. When the formula returns a nonzero value, or is not present, conditional formatting is displayed.
containsText, notContainsText, beginsWith, endsWith, containsBlanks, notContainsBlanks, containsErrors, notContainsErrors	An **f** element that specifies a formula that implements the operation specified by **type**. When the formula returns zero, conditional formatting is not displayed. When the formula returns a nonzero value, conditional formatting is displayed.

colorScale: A **CT_ColorScale** element that specifies a **color scale**.

dataBar: A **CT_DataBar** element that specifies a **data bar**.

iconSet: A **CT_IconSet** element that specifies an **icon set**.

dxf: A **CT_Dxf** ([ISO/IEC29500-4:2016] section A.2) element that specifies the differential formatting ([ISO/IEC29500-1:2016] section M.2.7.3.8) applied to the range. If **type** is "colorScale", "dataBar", or "iconSet", or the **priority** attribute does not exist, this element MUST NOT exist.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

type: An **ST_CfType** ([ISO/IEC29500-1:2016] section 18.18.12) attribute that specifies the way conditional formatting is displayed in the range.

If and only if **type** is "colorScale", a **colorScale** child element MUST exist in this element.

If and only if **type** is "dataBar", a **dataBar** child element MUST exist in this element.

If and only if **type** is "iconSet", an **iconSet** child element MUST exist in this element.

priority: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies the relative priority of this rule compared to the other rules in this **sheet**, or whether this **CT_CfRule** specifies extension information for a conditional formatting data bar rule as specified by the associated **CT_CfRule** ([ISO/IEC29500-4:2016] section A.2) element. MUST be greater than 0.

If **priority** exists, rules are applied in order from the smallest **priority** to the largest **priority** and it MUST NOT duplicate a **priority** value in any other **CT_CfRule** or **CT_CfRule** ([ISO/IEC29500-4:2016] section A.2) element that exists in the same **worksheet** part.

If **priority** does not exist, this **CT_CfRule** specifies extension information for a conditional formatting data bar rule, and the dataBar child element MUST exist and describe this additional information. The **id** attribute is used to identify the associated **CT_CfRule** ([ISO/IEC29500-4:2016] section A.2), and the **priority** attribute of this **CT_CfRule** ([ISO/IEC29500-4:2016] section A.2) specifies the relative priority of this rule. If neither the **priority** attribute nor the **id** attribute exists in this element, or if **id** exists but there exists no **CT_CfRule** ([ISO/IEC29500-4:2016] section A.2) element containing a matching **GUID**, this record and the succeeding dataBar child element MUST be ignored. If the **priority** attribute exists in this element, **id** MUST be ignored.

stopIfTrue: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether evaluation of additional conditional formatting rules is skipped for a cell if this rule evaluates to "true" for that cell.

Value	Meaning
"true"	Evaluation of additional conditional formatting rules is skipped for a cell if this rule evaluates to "true" for that cell.
"false"	Evaluation of additional conditional formatting rules is not skipped for a cell if this rule evaluates to "true" for that cell.

aboveAverage: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the conditional formatting rule is applied to cells with values above or below the average value of other cells in the range as specified by the following table. This attribute MUST NOT exist if **type** is not equal to "aboveAverage".

Value	Meaning
"true"	The conditional formatting rule is applied to cells with values above the average value of all cells in the range.
"false"	The conditional formatting rule is applied to cells with values below the average value of all cells in the range.

percent: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the conditional formatting rule is applied to a percentage of cells as specified by the following table. This attribute MUST NOT exist if **type** is not equal to "top10".

Value	Meaning
"true"	**rank** specifies the percentage of cells in the range to which conditional formatting is applied.
"false"	The conditional formatting rule is applied to the number of cells specified by **rank**.

bottom: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies how the conditional formatting rule is applied as specified by the following table. This attribute MUST NOT exist if **type** is not equal to "top10".

Value	Meaning
"true"	Conditional formatting is applied to cells whose value is in the bottom end of the range specified by **percent** and **rank**.
"false"	Conditional formatting is applied to cells whose value is in the top end of the range specified by **percent** and **rank**.

operator: An **ST_ConditionalFormattingOperator** ([ISO/IEC29500-1:2016] section 18.18.15) attribute that specifies the type of value comparison used for this conditional formatting rule. This attribute MUST NOT exist if **type** is not equal to "cellIs".

text: A **string** ([XMLSCHEMA2/2]section 3.2.1) attribute that specifies a text value used for this conditional formatting rule. This attribute MUST NOT exist if type is not equal to "beginsWith", "containsText", "endsWith", or "notContainsText".

timePeriod: An **ST_TimePeriod** ([ISO/IEC29500-1:2016] section 18.18.82) attribute that specifies the time period used for this conditional formatting rule. This attribute MUST NOT exist if **type** is not equal to "timePeriod".

rank: An **unsignedInt** ([XMLSCHEMA2/2]section 3.3.22) attribute that specifies how many cells are formatted by this conditional formatting rule. The value of **percent** specifies whether **rank** is a percentage or a quantity of cells. When **percent** is "true", **rank** MUST be greater than or equal to zero and less than or equal to 100. Otherwise, **rank** MUST be greater than or equal to 1 and less than or equal to 1,000. This attribute MUST NOT exist if **type** is not equal to "top10".

stdDev: An **int** ([XMLSCHEMA2/2]section 3.3.17) attribute that specifies the number of standard deviations above or below the average to format in the conditional formatting rule. This attribute MUST NOT exist if **type** is not equal to "aboveAverage" or if **equalAverage** is "true".

equalAverage: A **Boolean** ([XMLSCHEMA2/2]section 3.2.2) attribute that specifies, together with **aboveAverage**, how the conditional formatting rule is applied as specified by the following table. This attribute MUST NOT exist if **type** is not equal to "aboveAverage".

Value of equalAverage	Value of aboveAverage	Meaning
"true"	"true"	Conditional formatting is applied to cells whose value is equal to or above the average value of cells in the range.
"true"	"false"	Conditional formatting is applied to cells whose value is equal to or below the average value of cells in the range.
"false"	"true"	Conditional formatting is applied to cells whose value is above the average value of all cells in the range plus **stdDev** and multiplied by the standard deviation of all cells in the range.
"false"	"false"	Conditional formatting is applied to cells whose value is below the average value of all cells in the range minus **stdDev** and multiplied by the standard deviation of all cells in the range.

activePresent: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that MUST be "true" if, and only if, a formula is present in **f** and **type** is "colorScale", "dataBar", or "iconSet".

id: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that identifies this conditional formatting rule. If the priority attribute does not exist, and this attribute exists, this attribute is used to match this **CT_CfRule** element to the corresponding **CT_CfRule** ([ISO/IEC29500-4:2016] section A.2) element. If neither the priority attribute nor this attribute exists, this **CT_CfRule** and its child **CT_DataBar** element MUST be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CfRule">
  <xsd:sequence>
    <xsd:element ref="xm:f" minOccurs="0" maxOccurs="3"/>
    <xsd:element name="colorScale" type="CT_ColorScale" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="dataBar" type="CT_DataBar" minOccurs="0" maxOccurs="1"/>
```

```
      <xsd:element name="iconSet" type="CT IconSet" minOccurs="0" maxOccurs="1"/>
      <xsd:element name="dxf" type="x:CT_Dxf" minOccurs="0" maxOccurs="1"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="type" type="x:ST_CfType" use="optional"/>
    <xsd:attribute name="priority" type="xsd:int" use="optional"/>
    <xsd:attribute name="stopIfTrue" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="aboveAverage" type="xsd:boolean" use="optional" default="true"/>
    <xsd:attribute name="percent" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="bottom" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="operator" type="x:ST ConditionalFormattingOperator" use="optional"/>
    <xsd:attribute name="text" type="xsd:string" use="optional"/>
    <xsd:attribute name="timePeriod" type="x:ST_TimePeriod" use="optional"/>
    <xsd:attribute name="rank" type="xsd:unsignedInt" use="optional"/>
    <xsd:attribute name="stdDev" type="xsd:int" use="optional"/>
    <xsd:attribute name="equalAverage" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="activePresent" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="id" type="x:ST_Guid" use="optional"/>
  </xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.28 CT_IconSet

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CfRule

A complex type that specifies the properties of a **conditional formatting** rule that uses an **icon set**. The first **cfvo** element following this element MUST be ignored. There MUST be greater than or equal to three **cfvo** elements and MUST be less than or equal to five **cfvo** elements following this complex type.

Child Elements:

cfvo: A **CT_Cfvo** element that specifies a threshold value between each **icon** in the icon set.

cfIcon: A **CT_CfIcon** element that specifies a particular icon to use within an icon set. This element MUST be present if and only if **custom** equals "true".

Attributes:

iconSet: An **ST_IconSetType** attribute that specifies the icon set used.

showValue: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **cells** in the applied **range** display the icon and **cell value**, or the icon only.

Value	Meaning
"true"	The icon and cell value are shown in the cell.
"false"	Only the icon is shown in the cell.

percent: Undefined and MUST be ignored.

reverse: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the icons in the icon set specified in **iconSet** are shown in reverse order. If **custom** equals "true" this value MUST be ignored.

Value	Meaning
"true"	The icons specified in **iconSet** are shown in reverse order.

Value	Meaning
"false"	The icons specified in **iconSet** are shown in the order defined by the icon set.

custom: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether a custom set of icons is used. If this value is "true", there MUST be the same number of **cfIcon** elements as **cfvo** elements and the icons specified by the **cfIcon** elements are used rather than those specified by **iconSet**. If this value is "false", there MUST be 0 **cfIcon** elements.

Value	Meaning
"false"	No custom set of icons is used.
"true"	A custom set of icons is used.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT IconSet">
  <xsd:sequence>
    <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="unbounded"/>
    <xsd:element name="cfIcon" type="CT_CfIcon" minOccurs="0" maxOccurs="5"/>
  </xsd:sequence>
  <xsd:attribute name="iconSet" type="ST IconSetType" use="optional"
default="3TrafficLights1"/>
  <xsd:attribute name="showValue" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="percent" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="reverse" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="custom" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.29 CT_ColorScale

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CfRule

A complex type that specifies a **color scale** used in **conditional formatting**.

Child Elements:

cfvo: A **CT_Cfvo** element that specifies the **cell** values corresponding to the interpolation colors of the color scale. The **CT_ColorScale** MUST have either two or three child **CT_Cfvo** elements.

If there are two child **CT_Cfvo** elements present, the first child **CT_Cfvo** element specifies the cell value corresponding to the beginning color of the color scale. The second child **CT_Cfvo** element specifies the cell value corresponding to the end color of the color scale.

If there are three child **CT_Cfvo** elements present, the first child **CT_Cfvo** element specifies the cell value corresponding to the beginning color of the color scale. The second child **CT_Cfvo** element specifies the cell value corresponding to the midpoint color of the color scale. The third child **CT_Cfvo** element specifies the cell value corresponding to the end color of the color scale.

color: A **CT_Color** ([ISO/IEC29500-4:2016] section A.2) element that specifies the interpolation colors of the color scale for the **cfvo** element at the same corresponding position. The **CT_ColorScale** MUST have either two or three child **CT_Color** ([ISO/IEC29500-4:2016] section A.2) elements, and the number of child elements MUST equal the number of **CT_Cfvo** child elements.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ColorScale">
  <xsd:sequence>
    <xsd:element name="cfvo" type="CT Cfvo" minOccurs="2" maxOccurs="unbounded"/>
    <xsd:element name="color" type="x:CT_Color" minOccurs="2" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.30 CT_DataBar

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CfRule

A complex type that specifies a **data bar** used in **conditional formatting**.

Child Elements:

cfvo: A **CT_Cfvo** element (section 2.6.26) that specifies the **cell** values corresponding to the min/max length of the data bar. If there exist **CT_Cfvo** ([ISO/IEC29500-4:2016] section A.2) elements in this **sheet** that are child elements of a **CT_DataBar** ([ISO/IEC29500-4:2016] section A.2) element that is a child of a **CT_CfRule** ([ISO/IEC29500-4:2016] section A.2) element that is a parent of a **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element with a child **CT_Extension** ([ISO/IEC29500-4:2016] section A.2) element that has a child **ST_Guid** ([ISO/IEC29500-4:2016] section A.2) element equal to the **id** attribute of this complex type's parent **CT_CfRule** element (section 2.6.27), those **CT_Cfvo** elements SHOULD<12> be ignored. The first child **CT_Cfvo** element specifies the **condition** corresponding to the min length of the data bar. The second child **CT_Cfvo** element specifies the condition corresponding to the max length of the data bar.

fillColor: A **CT_Color** ([ISO/IEC29500-4:2016] section A.2) element that specifies the fill color of the data bar. This element MUST exist if and only if the **priority** attribute of the **CT_CfRule** that is a parent of this complex type exists.

borderColor: A **CT_Color** element that specifies the border color of the data bar. This element MUST exist if and only if **border** equals "true".

negativeFillColor: A **CT_Color** element that specifies the negative fill color of the data bar. This element MUST exist if and only if **negativeBarColorSameAsPositive** equals "false".

negativeBorderColor: A **CT_Color** element that specifies the negative border color of the data bar. This element MUST exist if and only if **negativeBarBorderColorSameAsPositive** equals "false" and **border** equals "true".

axisColor: A **CT_Color** element that specifies the axis color of the data bar. This element MUST exist if and only if **axisPosition** does not equal "none".

Attributes:

minLength: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the length of the shortest data bar in this conditional formatting **range**, expressed as a percentage of the width of the cell containing the data bar. MUST be greater than or equal to zero and less than or equal to **maxLength**. If, in this same **worksheet** part, there exists a **CT_ExtensionList** element that is a descendent of a **CT_CfRule** with a child **CT_Extension** element with the child **ST_Guid** element equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element, and the

minLength attribute of this element is zero ("0") and the **maxLength** attribute of this element is "100", the **minLength** attribute of the **CT_DataBar** element that is a descendent of the **CT_CfRule** element that is a parent of the **CT_ExtensionList** element that is a parent of the **CT_Extension** element with the child **ST_Guid** element equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element MUST be "10". If in this same worksheet part there exists an **CT_ExtensionList** element that is a descendent of a **CT_CfRule** with a child **CT_Extension** element with the child **ST_Guid** element equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element, and the **minLength** attribute of this element is not zero ("0") or the **maxLength** attribute of this element is not "100", the **minLength** attribute of the **CT_DataBar** element that is a descendent of the **CT_CfRule** element that is a parent of the **CT_ExtensionList** element that is a parent of the **CT_Extension** element with the child **ST_Guid** element that is equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element MUST be equal to this complex type's **minLength**.

maxLength: An **unsignedInt** attribute that specifies the length of the longest data bar in this conditional formatting range, expressed as a percentage of the width of the cell being formatted. MUST be greater than or equal to **minLength** and less than or equal to 100. If in this same worksheet part there exists a **CT_ExtensionList** element that is a descendent of a **CT_CfRule** with a child **CT_Extension** element with the child **ST_Guid** element equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element, and the **minLength** attribute of this element is zero ("0") and the **maxLength** attribute of this element is "100", the **maxLength** attribute of the **CT_DataBar** element that is a descendent of the **CT_CfRule** element that is a parent of the **CT_ExtensionList** element that is a parent of the **CT_Extension** element with the child **ST_Guid** element that is equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element MUST be "90". If, in this same worksheet part, there exists a **CT_ExtensionList** element that is a descendent of a **CT_CfRule** with a child **CT_Extension** element with the child **ST_Guid** element equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element, and the **minLength** attribute of this element is not zero ("0") or the **maxLength** attribute of this element is not "100", the **maxLength** attribute of the **CT_DataBar** element that is a descendent of the **CT_CfRule** element that is a parent of the **CT_ExtensionList** element that is a parent of the **CT_Extension** element with the child **ST_Guid** element that is equal to the **id** attribute of the **CT_CfRule** element that is a parent of this element MUST be equal to this record's **maxLength**.

showValue: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the cells in the conditional formatting range display both the data bar and the numeric value or only the data bar. The following table describes its possible values.

Value	Meaning
"false"	Only the data bar is displayed in the cell.
"true"	Both the data bar and the numeric value are displayed in the cell.

border: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the data bar has a border.

Value	Meaning
"true"	The data bar has a border.
"false"	The data bar has no border.

gradient: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the data bar has a gradient fill. The following table describes its possible values.

Value	Meaning
"false"	The data bar fill is a solid color.
"true"	The data bar fill is a gradient.

direction: An **ST_DataBarDirection** attribute section 2.7.7) that specifies the direction of the data bar.

negativeBarColorSameAsPositive: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the data bar has a negative bar color that is different from the positive bar color.

negativeBarBorderColorSameAsPositive: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the data bar has a negative border color that is different from the positive border color.

axisPosition: An **ST_DataBarAxisPosition** attribute (section 2.7.8) that specifies the axis position for the data bar.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataBar">
  <xsd:sequence>
    <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="2"/>
    <xsd:element name="fillColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="borderColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="negativeFillColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="negativeBorderColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="axisColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="minLength" type="xsd:unsignedInt" use="optional" default="10"/>
  <xsd:attribute name="maxLength" type="xsd:unsignedInt" use="optional" default="90"/>
  <xsd:attribute name="showValue" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="border" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="gradient" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="direction" type="ST_DataBarDirection" use="optional"
default="context"/>
  <xsd:attribute name="negativeBarColorSameAsPositive" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="negativeBarBorderColorSameAsPositive" type="xsd:boolean"
use="optional" default="true"/>
  <xsd:attribute name="axisPosition" type="ST_DataBarAxisPosition" use="optional"
default="automatic"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.31 CT_PivotField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: pivotField

This complex type specifies additional properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) **field**.

Attributes:

fillDownLabels: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the PivotTable ([ISO/IEC29500-1:2016] section 18.10) item labels are repeated for this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) field. This attribute is ignored when the **compact** attribute and the **outline** attribute of the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) field are "true". This attribute is ignored if the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) field is not on the PivotTable ([ISO/IEC29500-1:2016] section 18.10) **row** axis or the PivotTable ([ISO/IEC29500-1:2016] section 18.10) **column** axis. This value MUST be one of the following:

Value	Meaning
"false"	The item labels are not repeated.
"true"	The item labels are repeated for each nested item.

ignore: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) field SHOULD<13> be ignored.

If this attribute is "true", the ancestor **CT_PivotField** ([ISO/IEC29500-4:2016] section A.2) MUST have only the following attributes specified, and these attributes MUST have the following values.

Name	Value
compact	"false"
dataField	"true"
defaultSubtotal	"false"
dragOff	"false"
dragToCol	"false"
dragToData	"false"
dragToPage	"false"
dragToRow	"false"
includeNewItemsInFilter	"true"
itemPageCount	"false"
outline	"false"
showAll	"false"
subtotalTop	"false"
topAutoShow	"false"

If this attribute is equal to "true", there MUST exist a **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element with an **fld** attribute that specifies this PivotTable ([ISO/IEC29500-1:2016] section 18.10) field. Additionally, that **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element MUST have a **descendant CT_DataField** element with a **sourceField** attribute specified.

For more details, see CT_DataField.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT PivotField">
  <xsd:attribute name="fillDownLabels" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.32 CT_PivotTableDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: pivotTableDefinition

This element specifies additional properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) view.

Child Elements:

pivotEdits: A **CT_PivotEdits** element that specifies a collection of PivotTable What-if Analysis edits.

pivotChanges: A **CT_PivotChanges** element that specifies a collection of PivotTable What-if Analysis changes.

conditionalFormats: A **CT_ConditionalFormats** element that specifies a collection of conditional formats applied to the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view.

Attributes:

fillDownLabelsDefault: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies the behavior of **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) **fields** that are not a part of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view if they are later added to a PivotTable ([ISO/IEC29500-1:2016] section 18.10) view. MUST be a value from the following table.

Value	Meaning
"false"	Specifies that **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) fields added to the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view behave as if the **fillDownLabels** attribute of the **CT_PivotField** elements associated with those **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) fields are set to "false".
"true"	Specifies that **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) fields added to the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view behave as if the **fillDownLabels** attribute of the **CT_PivotField** elements associated with those **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) fields are set to "true".

visualTotalsForSets: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether **hidden** PivotTable ([ISO/IEC29500-1:2016] section 18.10) items will be included when calculating totals for **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) named sets. MUST be a value from the following table.

Value	Meaning
"false"	Include hidden PivotTable ([ISO/IEC29500-1:2016] section 18.10) items in the set totals.
"true"	Do not include hidden PivotTable ([ISO/IEC29500-1:2016] section 18.10) items in the set totals.

calculatedMembersInFilters: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether PivotTable ([ISO/IEC29500-1:2016] section 18.10) OLAP-calculated members participate in PivotTable ([ISO/IEC29500-1:2016] section 18.10) manual filters and PivotTable ([ISO/IEC29500-1:2016] section 18.10) advanced filters.

Value	Meaning
"false"	PivotTable ([ISO/IEC29500-1:2016] section 18.10) OLAP-calculated members do not participate in PivotTable ([ISO/IEC29500-1:2016] section 18.10) manual filters and PivotTable ([ISO/IEC29500-1:2016] section 18.10) advanced filters.
"true"	PivotTable ([ISO/IEC29500-1:2016] section 18.10) OLAP-calculated members participate in PivotTable ([ISO/IEC29500-1:2016] section 18.10) manual filters and PivotTable ([ISO/IEC29500-1:2016] section 18.10) advanced filters as do other PivotTable ([ISO/IEC29500-1:2016] section 18.10) items.

altText: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the alternate text for the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view. The string MUST be less than or equal to 2,000 characters in length.

altTextSummary: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the alternate text summary for the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view. This string MUST be less than or equal to 2,000 characters in length.

enableEdit: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether PivotTable what-if analysis is enabled for the current PivotTable ([ISO/IEC29500-1:2016] section 18.10) view.

autoApply: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether PivotTable what-if analysis values are automatically allocated.

allocationMethod: An **ST_AllocationMethod** attribute that specifies the allocation method to use for PivotTable what-if analysis.

weightExpression: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **Multidimensional Expressions (MDX)** of the weight expression for weighted allocations of PivotTable what-if analysis values. This string MUST be less than or equal to 65,535 characters in length.

hideValuesRow: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the values **row** in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) report is visible.

Value	Meaning
"false"	The values row in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) report is visible.
"true"	The values row in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) report is not visible.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotTableDefinition">
  <xsd:sequence>
    <xsd:element name="pivotEdits" type="CT_PivotEdits" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="pivotChanges" type="CT_PivotChanges" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="conditionalFormats" type="CT_ConditionalFormats" minOccurs="0"/>
  </xsd:sequence>
  <xsd:attribute name="fillDownLabelsDefault" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="visualTotalsForSets" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="calculatedMembersInFilters" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="altText" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="altTextSummary" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="enableEdit" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="autoApply" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="allocationMethod" type="ST_AllocationMethod" use="optional"
default="equalAllocation"/>
  <xsd:attribute name="weightExpression" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="hideValuesRow" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.33 CT_PivotCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: pivotCacheDefinition

A complex type that specifies the extended properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) **PivotCache** definition.

Attributes:

slicerData: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the Slicer Cache Relationship to PivotCache. MUST be "true" if the **OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) **PivotCache** definition is being referenced by a slicer cache.

pivotCacheId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute which uniquely identifies this PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache. The value MUST be greater than or equal to zero. The value MUST NOT be zero if there is a slicer cache that uses this PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache as a **data source**, or if there is a CT_PivotCacheIdVersion element that is preceded by this element.

supportSubqueryNonVisual: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the OLAP **source data** of this PivotTable ([ISO/IEC29500-1:2016] section 18.10) supports **hidden** PivotTable items.

supportSubqueryCalcMem: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the OLAP source data of this PivotTable supports PivotTable calculated members in an **OLAP subselect** for filtering.

Value	Meaning
"true"	The OLAP source data of this PivotTable supports PivotTable calculated members in an OLAP subselect for filtering.

Value	Meaning
"false"	The OLAP source data of this PivotTable does not support PivotTable calculated members in an OLAP subselect for filtering.

supportAddCalcMems: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether PivotTable ([ISO/IEC29500-1:2016] section 18.10) calculated members are shown for filtering.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotCacheDefinition">
  <xsd:attribute name="slicerData" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="supportSubqueryNonVisual" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="supportSubqueryCalcMem" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="supportAddCalcMems" type="xsd:boolean" use="optional"
default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.34 CT_Connection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: connection

A complex type that specifies the extended properties of an external connection ([ISO/IEC29500-1:2016] section 18.13).

Child Elements:

calculatedMembers: A **CT_CalculatedMembers** ([ISO/IEC29500-4:2016] section A.2) element that specifies a list of PivotTable ([ISO/IEC29500-1:2016] section 18.10) OLAP-calculated members associated with this external connection ([ISO/IEC29500-1:2016] section 18.13). If this external connection ([ISO/IEC29500-1:2016] section 18.13) is associated with a PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache, the list MUST NOT exist. If this element exists, the ancestor **CT_connection** ([ISO/IEC29500-4:2016] section A.2) element of this element MUST have a child **CT_OlapPr** ([ISO/IEC29500-1:2016] section 18.13.5) element.

Attributes:

culture: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the language associated with this external connection ([ISO/IEC29500-1:2016] section 18.13). The length of this string MUST be less than 85 characters. If the length of this string is greater than 0, the contents of this string SHOULD<14> be a language tag as specified by [RFC3066]. If this attribute is not present, the **data connection** is using the server language.

embeddedDataId: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies an embedded Custom Data part. The length of this value MUST be less than 65,536 characters. If the length of this string is greater than 0, the contents of this string MUST be equal to the **id** attribute of a **CT_DatastoreItem** element, in a Custom Data Properties part in this package ([ISO/IEC29500-1:2016] section 9).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Connection">
  <xsd:sequence>
    <xsd:element name="calculatedMembers" type="x:CT CalculatedMembers" minOccurs="0"
maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="culture" use="optional" type="x:ST_Xstring"/>
  <xsd:attribute name="embeddedDataId" use="optional" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.35 CT_Table

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: table

A complex type that specifies alternate text properties for the table.

Attributes:

altText: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the alternate text for the table. The string MUST be less than or equal to 25,000 characters in length.

altTextSummary: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the alternate text summary for the table. The string MUST be less than or equal to 50,000 characters in length.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Table">
  <xsd:attribute name="altText" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="altTextSummary" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.36 CT_CfIcon

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_IconSet

A complex type that specifies a single **icon** of an **icon set**.

Attributes:

iconSet: An **ST_IconSetType** attribute that specifies the icon set.

iconId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the icon to be used. If the icon set specified by **iconSet** has three icons, this value MUST be less than or equal to 2. If the icon set specified by **iconSet** has four icons, this value MUST be less than or equal to 3. If the icon set specified by **iconSet** has five icons, this value MUST be less than or equal to 4. If **iconSet** equals "NoIcons", this value MUST be 0.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CfIcon">
  <xsd:attribute name="iconSet" type="ST_IconSetType" use="required"/>
  <xsd:attribute name="iconId" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.37 CT_PivotEdits

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotTableDefinition

A complex type that specifies user inputs related to PivotTable what-if analysis in single **cells** of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area. It also specifies the collections of **MDX unique names** that identify the values in the **OLAP data source**, and specifies the PivotTable ([ISO/IEC29500-1:2016] section 18.10) rules that can be used to identify the cells in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

Child Elements:

pivotEdit: A **CT_PivotEdit** element that specifies user input, related to PivotTable what-if analysis, in a single cell of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area, and specifies the collection of MDX unique names that identifies the value in the OLAP data source, and specifies a PivotTable ([ISO/IEC29500-1:2016] section 18.10) rule that can be used to identify the cell in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT PivotEdits">
  <xsd:sequence>
    <xsd:element name="pivotEdit" minOccurs="1" maxOccurs="unbounded" type="CT_PivotEdit"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.38 CT_PivotEdit

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotEdits

A complex type that specifies user input, related to PivotTable what-if analysis, in a single **cell** of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

Child Elements:

userEdit: A **CT_PivotUserEdit** element that specifies the user input value or **formula** that replaces the original cell value, in a single cell of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

tupleItems: A **CT_TupleItems** element that specifies the **MDX unique names** that identify the value in the **OLAP data source** that was changed using PivotTable what-if analysis.

pivotArea: A **CT_PivotArea** ([ISO/IEC29500-4:2016] section A.2) element that specifies a PivotTable ([ISO/IEC29500-1:2016] section 18.10) rule that can be used to identify the cell in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotEdit">
  <xsd:sequence>
    <xsd:element name="userEdit" type="CT_PivotUserEdit" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="tupleItems" type="CT_TupleItems" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="pivotArea" type="x:CT_PivotArea" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.39 CT_PivotChanges

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotTableDefinition

A complex type that specifies the values used for PivotTable what-if analysis calculations and specifies the allocation methods for how to apply the values. It also specifies the collections of **MDX unique names** that identify the original values in the **OLAP data source** that were changed.

Child Elements:

pivotChange: A **CT_PivotChange** element that specifies the value used for PivotTable what-if analysis calculation and specifies the allocation method for how to apply the value. It also specifies a collection of MDX unique names that identifies the original value in the OLAP data source that was changed.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotChanges">
  <xsd:sequence>
    <xsd:element name="pivotChange" minOccurs="1" maxOccurs="unbounded"
type="CT_PivotChange"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.40 CT_PivotChange

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotChanges

A complex type that specifies the value used for [PivotTable what-if analysis](#) calculation and specifies the allocation method for how to apply the value. It also specifies a collection of **MDX unique names** that identifies the original value in the **OLAP data source** that was changed.

Child Elements:

editValue: A [**CT_PivotEditValue**](#) element that specifies the value that replaces the original value in the OLAP data source for the PivotTable what-if analysis.

tupleItems: A [**CT_TupleItems**](#) element that specifies the MDX unique names that identify the value in the OLAP data source that was changed using PivotTable what-if analysis.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) that specifies future extensibility for this element.

Attributes:

allocationMethod: An [**ST_AllocationMethod**](#) attribute that specifies the allocation method, used by PivotTable what-if analysis, to change the value in the OLAP data source.

weightExpression: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **OLAP weight expression** for PivotTable what-if analysis. The **weightExpression** MUST NOT exist if **allocationMethod** equals equalAllocation or equals equalIncrement. The **weightExpression** MUST be greater than or equal to 0 and less than or equal to 65,535 characters in length.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotChange">
  <xsd:sequence>
    <xsd:element name="editValue" type="CT_PivotEditValue" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="tupleItems" type="CT_TupleItems" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="allocationMethod" type="ST_AllocationMethod"
default="equalAllocation"/>
  <xsd:attribute name="weightExpression" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section [5.4](#) for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.41 CT_PivotUserEdit

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: [CT_PivotEdit](#)

A complex type that specifies user input, related to [PivotTable what-if analysis](#), in a single **cell** of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

Child Elements:

xm:f: An [**f**](#) element that specifies a **formula**. The formula MUST adhere to the grammar provided in [Formulas](#), with the following restriction: The **formula** MUST NOT use the bang-reference or bang-name production rules.

editValue: A [**CT_PivotEditValue**](#) element that specifies the user input value that replaces the original cell value, in a single cell of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotUserEdit">
  <xsd:choice minOccurs="1" maxOccurs="1">
    <xsd:element ref="xm:f" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="editValue" type="CT_PivotEditValue" minOccurs="1" maxOccurs="1"/>
  </xsd:choice>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.42 CT_PivotEditValue

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotUserEdit, CT_PivotChange

A complex type that specifies the value type of the user input in the single **cell** of the PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, data area, or value type of the value that replaces the original value in the **OLAP data source** for PivotTable what-if analysis, as specified in section 2.3.1.

Attributes:

valueType: An **ST_PivotEditValueType** attribute, as specified in section 2.7.11, that specifies the type of the value of the user input or the type of the value that replaces the original value in the OLAP data source.

The length of the string MUST be greater than zero and MUST be less than 32,768 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotEditValue">
  <xsd:simpleContent>
    <xsd:extension base="x:ST_Xstring">
      <xsd:attribute name="valueType" use="required" type="ST_PivotEditValueType"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.43 CT_TupleItems

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotEdit, CT_PivotChange

A complex type that specifies the **MDX unique names** that identify the value in the **OLAP data source** using PivotTable what-if analysis, as specified in section 2.3.1.

Child Elements:

tupleItem: An **ST_Xstring** element, as specified in [ISO/IEC29500-1:2016] section 22.9.2.19, that specifies an MDX unique name. The number of these elements MUST be greater than zero and MUST

be less than 2^31. The length of each **ST_Xstring** MUST be greater than zero and MUST be less than or equal to 65,535 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT TupleItems">
  <xsd:sequence>
    <xsd:element name="tupleItem" type="x:ST Xstring" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.44 CT_SlicerStyle

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerStyles

CT_SlicerStyle specifies table style elements, as specified in [ISO/IEC29500-1:2016] section 18.8, of the slicer style, as specified in section 2.3.2.4, that are specific to slicers, as specified in section 2.3.2.

Child Elements:

slicerStyleElements: A **CT_SlicerStyleElements**, as specified in section 2.6.52, that specifies table style elements of the slicer style that are specific to slicers. There MUST NOT be more than one **CT_SlicerStyleElements** in this element.

Attributes:

name: A **string** attribute, as specified in [XMLSCHEMA2/2] section 3.2.1, that specifies the name of the user-defined table style that this slicer style is based upon. The length of the **string** MUST be greater than or equal to 1 character and less than or equal to 255 characters. This **string** MUST be unique within the **CT SlicerStyle** elements in the **Styles** part, as specified in [ISO/IEC29500-1:2016] section 12.3.20. This **string** MUST match the **name** attribute of a **CT_TableStyle** element, as specified in [ISO/IEC29500-4:2016] section A.2, in the **Styles** part. In the **CT_TableStyle** element with a **name** attribute that matches this **string**, the **pivot** attribute MUST equal "false" and the **table** attribute MUST equal "false".

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerStyle">
  <xsd:sequence>
    <xsd:element name="slicerStyleElements" type="CT_SlicerStyleElements" minOccurs="0"
maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:string" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.45 CT_SlicerStyleElement

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerStyleElements

A complex type that specifies a table style element, as specified in [ISO/IEC29500-1:2016] section 18.8, of a slicer style, as specified in section 2.3.2.4.

Attributes:

type: An **ST_SlicerStyleType** attribute, as specified in section 2.7.13, that specifies the type of the table style element. This attribute MUST be unique within the parent **CT_SlicerStyleElements** complex type.

dxfId: An **ST_DxfId** attribute, as specified in [ISO/IEC29500-1:2016] section 18.18.25, that specifies a zero-based index for the list of elements specified by the **dxfs** global element, as specified in section 2.4.24. The specified **CT_Dxf** complex type, as specified in [ISO/IEC29500-4:2016] section A.2, specifies the formatting to use with this table style element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerStyleElement">
  <xsd:attribute name="type" type="ST_SlicerStyleType" use="required"/>
  <xsd:attribute name="dxfId" type="x:ST_DxfId" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.46 CT_OleItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: oleItem

OleItem is a complex type that specifies an OLE data item, as specified in [ISO/IEC29500-1:2016] section 18.14, with associated cached values.

Child Elements:

values: A **CT_DdeValues** element, as specified in [ISO/IEC29500-4:2016] section A.2, that specifies the cached values.

Attributes:

name: An **ST_Xstring** attribute, as specified in [ISO/IEC29500-1:2016] section 22.9.2.19, that specifies the name of the OLE data item.

icon: A **Boolean** attribute, as specified in [XMLSCHEMA2/2] section 3.2.2, that specifies whether the OLE data item is represented as an icon.

Value	Meaning
"false"	The OLE data item is not represented as an icon.
"true"	The OLE data item is represented as an icon.

advise: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the application requests that the **OLE data source**, as specified in [ISO/IEC29500-1:2016] section 18.14, provides notifications when the **source data** changes.

Value	Meaning
"false"	The application does not request to be notified when the source data changes.
"true"	The application requests to be notified when the source data changes.

preferPic: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the OLE data item is an image.

Value	Meaning
"false"	The OLE data item is not an image.
"true"	The OLE data item is an image.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OleItem">
  <xsd:sequence>
    <xsd:element name="values" type="x:CT_DdeValues" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="icon" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="advise" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="preferPic" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.47 CT_PivotHierarchy

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: pivotHierarchy

A complex type that specifies whether the ancestor **CT_PivotHierarchy** element, as specified in [ISO/IEC29500-4:2016] section A.2, SHOULD<15> be ignored.

The ancestor **CT_PivotHierarchy** element has the following restrictions on attributes.

Name	Value
caption	MUST NOT be specified.
dragOff	MUST equal "false".
dragToCol	MUST equal "false".
dragToData	MUST equal "true".
dragToPage	MUST equal "false".
dragToRow	MUST equal "false".

Name	Value
includeNewItemsInFilter	MUST equal "true".
multipleItemSelectionAllowed	MUST NOT be specified.
outline	MUST NOT be specified.
showInFieldList	MUST NOT be specified.
subtotalTop	MUST NOT be specified.

The ancestor **CT_PivotHierarchy** element has the following restrictions on child elements.

Child element	Restriction
CT_PivotHierarchy (this element)	Exactly 1 MUST exist.
CT_Members ([ISO/IEC29500-4:2016] section A.2)	MUST NOT exist.
CT_MemberProperties ([ISO/IEC29500-4:2016] section A.2)	MUST NOT exist.

If this element exists, there MUST exist a **CT_DataField** element, as specified in [ISO/IEC29500-4:2016] section A.2, with an **fld** attribute equal to the zero-based index of a **CT_CacheField** element, as specified in [ISO/IEC29500-4:2016] section A.2, in the list of **CT_CacheField** elements specified by **CT_CacheFields**, as specified in [ISO/IEC29500-4:2016] section A.2, with a **hierarchy** attribute that specifies a **CT_CacheHierarchy**, as specified in [ISO/IEC29500-4:2016] section A.2, with a zero-based index in the list of **CT_CacheHierarchy** elements specified by the **CT_CacheHierarchies** element, as specified in([ISO/IEC29500-4:2016] section A.2, equal to the zero-based index of the ancestor **CT_PivotHierarchy** element in the list of **CT_PivotHierarchy** elements specified by **CT_PivotHierarchies**, as specified in [ISO/IEC29500-4:2016] section A.2. Additionally, that **CT_DataField** element MUST have a **descendant** **CT_DataField** element, as specified in section 2.6.25, with a **sourceField** attribute specified.

For more details, see section 2.6.25.

Attributes:

ignore: A **Boolean** attribute, as specified in [XMLSCHEMA2/2] section 3.2.2, that MUST be "true" and MUST be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT PivotHierarchy">
  <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.48 CT_CacheField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: cacheField

This complex type specifies the ancestor **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) element that SHOULD<16> be ignored.

The following table lists the restrictions on attributes of the ancestor **CT_CacheField** element.

Name	Value
caption	MUST NOT be specified.
databaseField	MUST NOT be specified.
formula	MUST NOT be specified.
level	MUST equal "32767".
mappingCount	MUST NOT be specified.
memberPropertyField	MUST NOT be specified.
numFmtId	MUST equal zero ("0").
propertyName	MUST NOT be specified.
serverField	MUST NOT be specified.
sqlType	MUST NOT be specified.
uniqueList	MUST NOT be specified.

The following table lists the restrictions on child elements of the ancestor **CT_CacheField** element.

Child element	Restriction
CT_CacheField (this element)	Exactly 1 MUST exist.
CT_FieldGroup ([ISO/IEC29500-4:2016] section A.2)	MUST NOT exist.
CT_X ([ISO/IEC29500-4:2016] section A.2)	MUST NOT exist.
CT_SharedItems ([ISO/IEC29500-4:2016] section A.2)	MUST NOT exist.

If this element exists, there MUST exist a **CT_DataField** ([ISO/IEC29500-4:2016] section A.2) element with an **fld** attribute equal to the zero-based index of the ancestor **CT_CacheField** element in the list of **CT_CacheField** elements specified by **CT_CacheFields** ([ISO/IEC29500-4:2016] section A.2). Additionally, that **CT_DataField** element MUST have a **descendant** **CT_DataField** element (section 2.6.25) with a **sourceField** attribute specified.

For more details, see CT_DataField

Attributes:

ignore: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that MUST be "true" and MUST be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT CacheField">
  <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.49 CT_ConditionalFormats

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotTableDefinition

This complex type specifies a collection of conditional formats applied to the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view.

Child Elements:

conditionalFormat: A **CT_ConditionalFormat** element that specifies the **conditional formatting** applied to the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of **conditionalFormat** child elements of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ConditionalFormats">
  <xsd:sequence>
    <xsd:element name="conditionalFormat" minOccurs="1" maxOccurs="unbounded"
type="CT ConditionalFormat"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.50 CT_ConditionalFormat

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_ConditionalFormats

This complex type specifies the scope, type, and priority of **conditional formatting** applied to this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) view.

Child Elements:

pivotAreas: A **CT_PivotAreas** ([ISO/IEC29500-4:2016] section A.2) element that specifies a set of PivotTable areas this conditional formatting applies to.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

scope: An **ST_Scope** ([ISO/IEC29500-1:2016] section 18.18.67) attribute that specifies the scope of this conditional formatting.

type: An **ST_Type** ([ISO/IEC29500-1:2016] section 18.18.84) attribute that MUST NOT be present or MUST be equal to "none".

priority: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the priority of the PivotTable conditional formatting. This value MUST be greater than or equal to 1. If this attribute is present, there MUST exist a **CT_CfRule** with a **priority** attribute equal to the value of this **field** and

it MUST be the same **CT_CfRule** element that is specified by **id**. The **CT_CfRule** specified by this value MUST have an ancestor **CT_ConditionalFormatting** element with a **pivot** attribute equal to "true".

id: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a particular **CT_CfRule**. There MUST exist a **CT_CfRule** with an **id** attribute equal to this value and it MUST be the same **CT_CfRule** element that is specified by **priority**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ConditionalFormat">
  <xsd:sequence>
    <xsd:element name="pivotAreas" type="x:CT_PivotAreas" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="x:CT_ExtensionList"/>
  </xsd:sequence>
  <xsd:attribute name="scope" type="x:ST_Scope" default="selection" use="optional"/>
  <xsd:attribute name="type" type="x:ST_Type" default="none" use="optional"/>
  <xsd:attribute name="priority" use="optional" type="xsd:unsignedInt"/>
  <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.51 CT_SlicerStyles

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: slicerStyles

A complex type that specifies a group of slicer styles and the default slicer style to apply to slicers.

Child Elements:

slicerStyle: A CT_SlicerStyle element that specifies a slicer style.

Attributes:

defaultSlicerStyle: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the default slicer style to apply to slicers. The length of the string MUST be greater than or equal to 1 character and less than or equal to 255 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerStyles">
  <xsd:sequence>
    <xsd:element name="slicerStyle" type="CT_SlicerStyle" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="defaultSlicerStyle" type="xsd:string" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.52 CT_SlicerStyleElements

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerStyle

A complex type that specifies the list of table style ([ISO/IEC29500-1:2016] section 18.8) elements of a slicer style that are specific to slicers.

Child Elements:

slicerStyleElement: A **CT_SlicerStyleElement** element that specifies a table style ([ISO/IEC29500-1:2016] section 18.8) element of a slicer style that is specific to slicers.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerStyleElements">
  <xsd:sequence>
    <xsd:element name="slicerStyleElement" type="CT SlicerStyleElement" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.53 CT_IgnoredErrors

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: ignoredErrors

A complex type that specifies a list of **cell ranges** and the types of cell errors that are to be ignored for each of those specific cell ranges.

Child Elements:

ignoredError: A **CT_IgnoredError** element that specifies the types of cell errors that are to be ignored for a specific cell range.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_IgnoredErrors">
  <xsd:sequence>
    <xsd:element name="ignoredError" type="CT_IgnoredError" minOccurs="0"
maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.54 CT_IgnoredError

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_IgnoredErrors

A complex type that specifies the types of **cell** errors that are to be ignored for a specific cell **range**. This complex type is equivalent to **CT_IgnoredError** ([ISO/IEC29500-1:2016] section 18.3.1.50), but allows the **sqref** child element to have greater than or equal to 8,192 ref child elements.

Child Elements:

xm:sqref: A **sqref** element that specifies the range where cell errors have been ignored. This **sqref** MUST have greater than or equal to 8,192 **ref** child elements.

Attributes:

evalError: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore calculation errors.

Value	Meaning
"true"	Ignore calculation errors.
"false"	Do not ignore calculation errors.

twoDigitTextYear: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from the formatting of date/time values.

Value	Meaning
"true"	Ignore errors arising from the formatting of data/time values.
"false"	Do not ignore errors arising from the formatting of date/time values.

numberStoredAsText: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from the formatting of numeric values.

Value	Meaning
"true"	Ignore errors arising from the formatting of numeric values.
"false"	Do not ignore errors arising from the formatting of numeric values.

formula: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from formulas that are inconsistent with formulas ([ISO/IEC29500-1:2016] section 18.17) in neighboring cells.

Value	Meaning
"true"	Ignore errors arising from formulas that are inconsistent with formulas ([ISO/IEC29500-1:2016] section 18.17) in neighboring cells.
"false"	Do not ignore errors arising from formulas that are inconsistent with formulas ([ISO/IEC29500-1:2016] section 18.17) in neighboring cells.

formulaRange: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from formulas ([ISO/IEC29500-1:2016] section 18.17) that contain references to less than the entirety of a range containing contiguous data.

Value	Meaning
"true"	Ignore errors arising from formulas ([ISO/IEC29500-1:2016] section 18.17) that contain references to less than the entirety of a range containing contiguous data.
"false"	Do not ignore errors arising from formulas ([ISO/IEC29500-1:2016] section 18.17) that contain references to less than the entirety of a range containing contiguous data.

unlockedFormula: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from unprotected formulas ([ISO/IEC29500-1:2016] section 18.17).

Value	Meaning
"true"	Ignore errors arising from unprotected formulas ([ISO/IEC29500-1:2016] section 18.17).
"false"	Do not ignore errors arising from unprotected formulas ([ISO/IEC29500-1:2016] section 18.17).

emptyCellReference: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from references to empty cells.

Value	Meaning
"true"	Ignore errors arising from references to empty cells.
"false"	Do not ignore errors arising from references to empty cells.

listDataValidation: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from **data validation**.

Value	Meaning
"true"	Ignore errors arising from data validation.
"false"	Do not ignore errors arising from data validation.

calculatedColumn: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to ignore errors arising from **calculated column** formulas ([ISO/IEC29500-1:2016] section 18.17).

Value	Meaning
"true"	Ignore errors arising from calculated column formulas ([ISO/IEC29500-1:2016] section 18.17).
"false"	Do not ignore errors arising from calculated column formulas ([ISO/IEC29500-1:2016] section 18.17).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_IgnoredError">
  <xsd:sequence>
    <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="evalError" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="twoDigitTextYear" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="numberStoredAsText" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="formula" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="formulaRange" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="unlockedFormula" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="emptyCellReference" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="listDataValidation" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="calculatedColumn" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.55 CT_ProtectedRanges

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: protectedRanges

A complex type that specifies a group of protected **ranges** on the **sheet**. MUST contain fewer than 2^{31} elements.

Child Elements:

protectedRange: A CT_ProtectedRange element that specifies the properties for a single protected range.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ProtectedRanges">
  <xsd:sequence>
    <xsd:element name="protectedRange" type="CT_ProtectedRange" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.56 CT_ProtectedRange

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_ProtectedRanges

A complex type that specifies a **cell range** to be unprotected. The cell range is editable with a password or proper **credentials** when **sheet protection** is on and the cell is **locked**.

Child Elements:

xm:sqref: A [sqref](#) element that specifies the cell range to be unprotected.

Attributes:

password: An **ST_UnsignedShortHex** ([ISO/IEC29500-4:2016] section 15.7.2) attribute that specifies the verifier value of the password required for editing the cell range. If the value is 0x0000, then there is no password.

The verifier value is calculated in two stages. First, the provided **Unicode** password string is converted to a new character string in the ANSI code page of the current system by using the algorithm specified in the **revisionsPassword** attribute in [ISO/IEC29500-1:2016] section 18.2.29. Second, this string is input into the **XOR obfuscation** algorithm specified in [MS-OFFCRYPTO] section 2.3.7.1 to produce a 16-bit password verifier value.

This attribute MUST NOT be present if **algorithmName** is present.

algorithmName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the **hash** algorithm used to calculate **hashValue**. If this attribute is present, **hashValue**, **saltValue**, and **spinCount** MUST also be present. This attribute MUST NOT be present if **password** is present.

hashValue: A **base64Binary** ([XMLSCHEMA2/2] section 3.2.16) attribute that specifies the hash value for the password required to edit this range. This value will be compared with the resulting hash value after hashing the user-supplied password by using the algorithm specified by **algorithmName**, and if the two values match, the protection will no longer be enforced.

Password hashes are computed by the algorithm specified in [MS-OFFCRYPTO] section 2.4.2.4. Under circumstances as specified in [MS-OFFCRYPTO] section 1.3.4, the password is first converted to a 16-bit verifier value and reinterpreted as a single Unicode character, which is then passed to the algorithm specified in [MS-OFFCRYPTO] section 2.4.2.4. There is no way to determine which method was used to generate a hash without knowledge of the password; it is necessary to compute both hashes to verify the password.

This attribute MUST be present if and only if **algorithmName** is present.

saltValue: A **base64Binary** ([XMLSCHEMA2/2] section 3.2.16) attribute that specifies the **salt** used to calculate **hashValue**. This attribute MUST be present if and only if **algorithmName** is present.

spinCount: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of times that the hash function was iterated over the password to generate the **hashValue**. It MUST NOT be greater than 10,000,000. This attribute MUST be present if and only if **algorithmName** is present.

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the title of the cell range. The value MUST be unique for the sheet. The number of characters in the string MUST be greater than or equal to 1, and less than or equal to 255. The string MUST conform to the following **Augmented Backus-Naur Form (ABNF)** ([RFC5234]) grammar:

```
string =  name-start-character *name-character

name-start-character = " " / "\" / Unicode-character

name-character = name-start-character / Unicode-space / Unicode-digit / "?" / "."
```

The following points summarize this grammar:

▪ Unicode-character is any code point that is a character as defined by the Unicode character properties, [UNICODE5.1] chapter 4.

- Unicode-digit is any code point that is a digit as defined by the Unicode character properties, [UNICODE5.1] chapter 4.

- Unicode-space is any code point that is a space as defined by the Unicode character properties, [UNICODE5.1] chapter 4.

securityDescriptor: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that describes a **security descriptor** ([MS-AZOD] section 1.1.1.3) that lists users who can edit the cell range without providing the password.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ProtectedRange">
  <xsd:sequence maxOccurs="1">
    <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="password" type="x:ST_UnsignedShortHex" use="optional"/>
  <xsd:attribute name="algorithmName" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
  <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
  <xsd:attribute name="spinCount" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="securityDescriptor" type="xsd:string" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.57 CT_IconFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: iconFilter

This complex type specifies the **icon set** and particular **icon** within that set to **filter** by. **Rows** with a cell icon that do not match these criteria will be hidden when the filter is applied.

Attributes:

iconSet: An **ST_IconSetType** attribute that specifies the icon set used as the filter criteria.

iconId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the index of the icon to be used as filter criteria. If **iconSet** is "NoIcons", this value MUST be 0 and this record does not specify a filter and MUST be ignored. If **iconSet** is not "NoIcons", this value MUST be greater than or equal to 0. If the icon set specified by **iconSet** has three icons, this value MUST be less than or equal to 2. If the icon set specified by **iconSet** has four icons, this value MUST be less than or equal to 3. If the icon set specified by **iconSet** has five icons, this value MUST be less than or equal to 4.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_IconFilter">
  <xsd:attribute name="iconSet" type="ST_IconSetType" use="required"/>
  <xsd:attribute name="iconId" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.58 CT_Filter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: filter

This complex type specifies a **filter** criterion. **Rows** that contain a **cell** within the filter **range** that have value **val** will not be hidden by this **filter** criterion. Rows that do not contain such a cell inside a **filters** element ([ISO/IEC29500-1:2016] section 18.3.2.8) will be hidden.

Attributes:

val: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the value to be used as a filter criterion. The length of this value MUST be less than 65536 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Filter">
  <xsd:attribute name="val" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.59 CT_CustomFilters

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: customFilters

This complex type specifies custom **filter** criteria. **Rows** that contain a **cell** within the filter **range** such that the value does not meet the custom filter criteria will be hidden.

Child Elements:

customFilter: A **CT_CustomFilter** element that specifies a custom filter criterion.

Attributes:

and: A Boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies the relationship between custom filter criterion. This attribute only applies when there are two criteria.

Value	Meaning
"false"	The two criteria are related by an OR relationship. That is, for a cell value to meet the custom filter criteria, at least one criterion specified by the **customFilter** child elements MUST be met.
"true"	The two criteria are related by an AND relationship. That is, for a cell value to meet the custom filter criteria, both criteria specified by the **customFilter** child elements MUST be met.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CustomFilters">
  <xsd:sequence>
    <xsd:element name="customFilter" type="CT CustomFilter" minOccurs="1" maxOccurs="2"/>
  </xsd:sequence>
  <xsd:attribute name="and" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.60 CT_CustomFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CustomFilters

This complex type specifies a custom **filter** criterion.

Attributes:

operator: An **ST_FilterOperator** ([ISO/IEC29500-1:2016] section 18.18.31) attribute that specifies the operator of the custom filter criterion.

val: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the value to be used as a custom filter criterion. The length of this value MUST be less than 65536 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CustomFilter">
  <xsd:attribute name="operator" type="x:ST_FilterOperator" default="equal" use="optional"/>
  <xsd:attribute name="val" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.61 CT_SortCondition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_RichSortCondition, sortCondition, CT_SortRule

A complex type that specifies a **sort condition** to apply to a **range**.

Attributes:

descending: A boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies the direction of the **sort**.

Value	Meaning
"false"	If **sortBy** is "value", sort in ascending order. If **sortBy** is "cellColor" or "fontColor", cells in which the cell color or cell font color specified by **dxfId** occurs are ordered at the top of the range. If **sortBy** is "icon", cells in which the icon specified by **iconSet** and **iconId** occurs are ordered at the top of the range.
"true"	If **sortBy** is "value", sort in descending order. If **sortBy** is "cellColor" or "fontColor", cells in which the cell color or cell font color specified by **dxfId** occurs are ordered at the bottom of the range. If **sortBy** is "icon", cells in which the icon specified by **iconSet** and **iconId** occurs are ordered at the bottom of the range.

sortBy: An **ST_SortBy** ([ISO/IEC29500-1:2016] section 18.18.72) attribute that specifies how the cells in a range are sorted.

ref: An **ST_Ref** ([ISO/IEC29500-1:2016] section 18.18.62) attribute that specifies the **row** or **column** to which this sort condition applies. This value MUST be contained within the **ref** in the **sortState** ([ISO/IEC29500-1:2016] section 18.3.1.92) element that precedes this element. If the **sortState.columnSort** attribute that precedes this element is "false", this value specifies the column to which this sort condition applies and there MUST be only a single column specified by **ref**. If the **sortState.columnSort** attribute that precedes this element is "true", this value specifies the row to which this sort condition applies and there MUST be only a single row specified by **ref**.

customList: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies a comma-delimited list of strings that specifies a custom **sort order**. The order of strings in the list specifies the sort order. When a cell value matches a string in the list, it is sorted ahead of the cell values that match a later string in the list, and so on for each cell in the range. MUST be ignored if **sortBy** is not equal to "value".

dxfId: An **ST_DxfId** ([ISO/IEC29500-1:2016] section 18.18.25) attribute that specifies the format identifier when **sortBy** equals "cellColor" or **sortBy** equals "fontColor". MUST NOT be present if **sortBy** equals "icon" or "value".

iconSet: An ST_IconSetType attribute that specifies the icon set when **sortBy** equals "icon". The absence of this attribute means no icon. MUST NOT be present if **sortBy** is not equal to "icon".

iconId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the zero-based index of an icon in an **icon set**. If the icon set specified by **iconSet** has three icons, this value MUST be less than or equal to 2. If the icon set specified by **iconSet** has four icons, this value MUST be less than or equal to 3. If the icon set specified by **iconSet** has five icons, this value MUST be less than or equal to 4. The absence of this attribute means no icon. MUST NOT be present if **sortBy** is not equal to "icon".

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SortCondition">
  <xsd:attribute name="descending" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="sortBy" type="x:ST_SortBy" use="optional" default="value"/>
  <xsd:attribute name="ref" type="x:ST_Ref" use="required"/>
  <xsd:attribute name="customList" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="dxfId" type="x:ST_DxfId" use="optional"/>
  <xsd:attribute name="iconSet" type="ST_IconSetType" use="optional" default="3Arrows"/>
  <xsd:attribute name="iconId" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.62 CT_SourceConnection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_CacheSourceExt, sourceConnection

A complex type that stores the connection, which is specified by the **CT_Connection** element as specified in [ISO/IEC29500-4:2016] section A.2, that is associated with this pivot cache. The pivot cache MUST be associated with either an **OLAP** slicer cache or a Non-Worksheet PivotTable.

Attributes:

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the connection, which is specified by the **name** attribute of **CT_Connection** ([ISO/IEC29500-4:2016] section A.2) for the connection that is associated with this pivot cache. The length, in characters, of this value MUST be less than 65,536.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SourceConnection">
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.63 CT_ListItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_ListItems

A complex type that stores a single item for a list box or a drop-down form **control**<17>.

Attributes:

val: A **string** attribute, as specified in [XMLSCHEMA2/2] section 3.2.1, that specifies the data for a single item.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ListItem">
  <xsd:attribute name="val" type="xsd:string" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.64 CT_ListItems

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

A complex type that contains a list of items of type **CT_ListItem**, as specified in section 2.6.63, to populate a list box or a drop-down form **control**. When present, the **FmlaRange** attribute of **CT_FormControlPr**, as specified in section 2.6.65, takes precedence over this element. This element is valid only for list box and drop-down form control.

Child Elements:

item: A **CT_ListItem** element that contains a single data item for a list box or drop-down form control.

extLst: A **CT_ExtensionList** element, as specified in ([ISO/IEC29500-4:2016] section A.2, that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ListItems">
  <xsd:sequence>
    <xsd:element name="item" type="CT_ListItem" minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
```

```
    </xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.65 CT_FormControlPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: formControlPr

A complex type that stores a form control's properties.

Child Elements:

itemLst: A **CT_ListItems** element, as specified in section 2.6.64, that specifies a list of items to populate a list box or drop-down form control.

extLst: A **CT_ExtensionList** element, as specified in [ISO/IEC29500-4:2016] section A.2, that specifies future extensibility for this element.

Attributes:

objectType: An **ST_ObjectType** attribute that specifies the form control object type.

checked: An **ST_Checked** attribute that specifies whether a check box is selected or a radio button is selected. This attribute only applies to check box and radio button form controls.

colored: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether a drop-down object has a color applied to it. This attribute only applies to drop-down form controls.

Value	Meaning
"true"	A drop-down object has a color applied to it.
"false"	A drop-down object has no color applied to it.

dropLines: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of lines in the drop-down before scroll bars are added. This attribute only applies to drop-down form controls. This value MUST be at least 0 and at most 30000.

dropStyle: An **ST_DropStyle** attribute that specifies the style of the drop-down. This attribute only applies to drop-down form controls.

dx: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the width of the scroll bar in pixels. This attribute only applies to list boxes, scroll bars, spin boxes and drop-downs<18>.

firstButton: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the object is the first button in a set of radio buttons. This attribute only applies to radio button form controls.

Value	Meaning
"true"	The object is the first button in a set of radio buttons.
"false"	The object is not the first button in a set of radio buttons.

fmlaGroup: An **ST_Formula** ([ISO/IEC29500-1:2016] section 18.18.35) attribute that specifies the cell an object in a group box is linked to. This attribute overrides the attribute **fmlaLink** for any radio buttons within a group box. This attribute only applies to group box form controls. The application can choose to remove and not save this element and use the attribute **fmlaLink** of the first radio button in the group. This attribute MUST be a **cell reference** (see [ISO/IEC29500-1:2016] section 18.17.2.3).

fmlaLink: An **ST_Formula** ([ISO/IEC29500-1:2016] section 18.18.35) attribute that specifies the **cell** the object is linked to. This attribute only applies to check boxes, radio buttons, scroll bars, spin boxes, drop-downs and list boxes. The value in the linked cell and the index of the selected item in the object are linked together. This link is ignored if the form control allows multiple selections. This attribute MUST be a cell reference (see [ISO/IEC29500-1:2016] section 18.17.2.3).

fmlaRange: An **ST_Formula** ([ISO/IEC29500-1:2016] section 18.18.35) attribute that specifies the range of **source data** cells. This is used to populate a list box or a drop-down form control[19]. This attribute only applies to list box and drop-down form controls. This attribute MUST be a cell reference (see [ISO/IEC29500-1:2016] section 18.17.2.3).

fmlaTxbx: An **ST_Formula** ([ISO/IEC29500-1:2016] section 18.18.35) attribute that specifies the source data cell that the form **control** object's data is linked to. Any cell **range** can be specified but only the first cell in the range is considered. This attribute applies only to label and edit box form controls. This attribute MUST be a cell reference (see [ISO/IEC29500-1:2016] section 18.17.2.3).

horiz: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the scroll bar is horizontal. This attribute only applies to scroll bar form controls.

inc: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the change in the current value of a scroll bar or a spin box form control as a result of on an increment click. If present, it MUST be at least 0 and at most 30000. This attribute applies only to scroll bar or spin box form controls.

justLastX: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the last line in text is justified when in an East Asian alignment[20].

Value	Meaning
"true"	The last line in text is justified when in an East Asian alignment.
"false"	the last line in text is not justified when in an East Asian alignment.

lockText: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the object's text is locked. This attribute applies only to button, radio button, check box and label form controls.

Value	Meaning
"true"	The object's text is locked.
"false"	The object's text is not locked.

max: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the maximum value generated by the scroll bar (when scrolled all the way down) or by the spin box. It MUST be at least 0 and at most 30000. This attribute only applies to scroll bars and spin boxes.

min: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the minimum value generated by the scroll bar (when scrolled all the way up) or by the spin box. It MUST be at least 0 and at most 30000. This attribute only applies to scroll bars and spin box.

multiSel: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the indices of selected items as a comma-delimited list. The list indices are one-based. This attribute is valid only if the attribute **selType** has the value "multi". This attribute applies only to list box form controls.

noThreeD: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether 3-D effects are disabled. This attribute only applies to check box, radio button, group box, scroll bar, drop-down, list box, and spin box form controls.

Value	Meaning
"true"	The 3-D effects are disabled.
"false"	The 3-D effects are enabled.

noThreeD2: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether 3-D effects are disabled. This element is used for drop-downs and list boxes<21>.

Value	Meaning
"true"	The 3-D effects are disabled.
"false"	The 3-D effects are enabled.

page: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of items to move the scroll bar or spin box on a page click. It MUST be at least 0 and at most 30000<22>.

sel: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the index of the selected item. The list indices are one-based. If set to a value of 0, no items are selected. This attribute applies only to list box and drop-down form controls.

seltype: An **ST_SelType** attribute that specifies the selection type for the list box. This attribute applies only to list box form controls.

textHAlign: An **ST_TextHAlign** attribute that specifies the horizontal text alignment for the object<23>.

textVAlign: An **ST_TextVAlign** attribute that specifies the vertical text alignment for the object<24>.

val: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of top **rows** currently hidden in the scroll bar. If omitted, the value is assumed to be 0. Those rows are hidden but still accessible by clicking the scroll bar buttons. The number of top hidden rows can change as the user interacts with the scroll bar. This attribute only applies to scroll bar, spin box, list box, and drop-down form controls.

widthMin: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the smallest width allowed for the drop-down box window in screen **pixels**. This attribute only applies for drop-down form controls.

editVal: An **ST_EditValidation** attribute that specifies how the edit box content is validated if the application chooses to validate it. This attribute only applies to edit box form controls.

multiLine: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the form control is multiline. This attribute only applies to edit box form controls. This attribute only works when the form control is run in a dialog box.

Value	Meaning
"true"	The form control is multiline.
"false"	The form control is singleline.

verticalBar: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the control has a vertical scroll bar. This attribute only applies to edit box form controls. This attribute only works when the form control is run in a dialog box.

Value	Meaning
"true"	The control has a vertical scroll bar.
"false"	The control has no vertical scroll bar.

passwordEdit: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the edit box control stores a password. In this case the control will display * for every character on it. This attribute only applies to edit box form controls. This attribute only works when the control is run in a dialog box.

Value	Meaning
"true"	The edit box control stores a password.
"false"	The edit box control does not store password.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_FormControlPr">
  <xsd:sequence>
    <xsd:element name="itemLst" type="CT_ListItems" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="objectType" type="ST_ObjectType" use="optional"/>
  <xsd:attribute name="checked" type="ST_Checked" use="optional"/>
  <xsd:attribute name="colored" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="dropLines" type="xsd:unsignedInt" use="optional" default="8"/>
  <xsd:attribute name="dropStyle" type="ST_DropStyle" use="optional"/>
  <xsd:attribute name="dx" type="xsd:unsignedInt" use="optional" default="80"/>
  <xsd:attribute name="firstButton" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="fmlaGroup" type="x:ST_Formula" use="optional"/>
  <xsd:attribute name="fmlaLink" type="x:ST_Formula" use="optional"/>
  <xsd:attribute name="fmlaRange" type="x:ST_Formula" use="optional"/>
  <xsd:attribute name="fmlaTxbx" type="x:ST_Formula" use="optional"/>
  <xsd:attribute name="horiz" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="inc" type="xsd:unsignedInt" use="optional" default="1"/>
  <xsd:attribute name="justLastX" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="lockText" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="max" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="min" type="xsd:unsignedInt" use="optional" default="0"/>
  <xsd:attribute name="multiSel" type="xsd:string" use="optional"/>
  <xsd:attribute name="noThreeD" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="noThreeD2" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="page" type="xsd:unsignedInt" use="optional"/>
```

```
    <xsd:attribute name="sel" type="xsd:unsignedInt" use="optional"/>
    <xsd:attribute name="seltype" type="ST_SelType" use="optional" default="single"/>
    <xsd:attribute name="textHAlign" type="ST_TextHAlign" use="optional" default="left"/>
    <xsd:attribute name="textVAlign" type="ST_TextVAlign" use="optional" default="top"/>
    <xsd:attribute name="val" type="xsd:unsignedInt" use="optional"/>
    <xsd:attribute name="widthMin" type="xsd:unsignedInt" use="optional"/>
    <xsd:attribute name="editVal" type="ST_EditValidation" use="optional"/>
    <xsd:attribute name="multiLine" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="verticalBar" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="passwordEdit" type="xsd:boolean" use="optional" default="false"/>
  </xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.66 CT_DatastoreItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: datastoreItem

A complex type that specifies properties for an embedded custom data part.

Child Elements:

extLst: A **CT_ExtensionList** element, as specified in ([ISO/IEC29500-4:2016] section A.2, that specifies future extensibility for this element.

Attributes:

id: An **ST_Xstring** attribute, as specified in ([ISO/IEC29500-1:2016] section 22.9.2.19, that specifies the identifier for the associated Custom Data storage. The value of the string is used to identify the associated Custom Data storage, and the value of the string MUST be unique for each Custom Data storage in the workbook. The length of this value MUST be less than 65536 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_DatastoreItem">
      <xsd:sequence>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="id" type="x:ST_Xstring" use="required"/>
    </xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.67 CT_Slicers

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: slicers

A complex type that specifies a list of **CT_Slicer** elements, as specified in section 2.6.69. The list of **CT_Slicer** elements specifies all slicer views on the **worksheet**.

Child Elements:

slicer: A **CT_Slicer** element that specifies a slicer view on the worksheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Slicers">
  <xsd:sequence>
    <xsd:element name="slicer" type="CT_Slicer" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.68 CT_Slicer

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_Slicers

A complex type that specifies a slicer view, as specified in section 2.3.2.2, in this **worksheet**.

Child Elements:

extLst: A **CT_ExtensionList** element, a specified in [ISO/IEC29500-4:2016] section A.2, that specifies future extensibility for this element.

Attributes:

name: An **ST_Xstring** attribute, as specified in [ISO/IEC29500-1:2016] section 22.9.2.19, that specifies the name of the slicer view. MUST be a unique case-insensitive name within the scope of this **workbook**. The length of this attribute MUST be greater than or equal to 1 character and MUST be less than or equal to 32767 characters.

xr10:uid: An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the slicer view. If any instance of this type specifies this attribute, then all instances MUST specify it, and the values MUST be distinct.

cache: An **ST_Xstring** attribute that specifies the name of the slicer cache, as specified in section 2.3.2.1, that this slicer view is associated with. There MUST be a **CT_SlicerCacheDefinition** element, as specified in section 2.6.70, within this workbook with the **name** attribute equal to the value of this attribute.

caption: An **ST_Xstring** attribute that specifies the caption of the slicer view. If this string exists, the length MUST be greater than or equal to 1 character.

startItem: An **unsignedInt** attribute, as specified in [XMLSCHEMA2/2] section 3.3.22, that specifies the zero-based index of the first slicer item, as specified in section 2.3.2.1.6, displayed by the slicer view.

columnCount: An **unsignedInt** attribute that specifies the number of **columns** in the slicer view. MUST be greater than or equal to 1 and MUST be less than or equal to 20000.

showCaption: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the caption is displayed.

Value	Meaning
"true"	The caption is displayed.
"false"	The caption is suppressed.

level: An **unsignedInt** attribute that specifies the **OLAP level** of the **OLAP hierarchy** of the slicer source data used by this slicer view.

If the slicer source data is **OLAP**, the value MUST be greater than or equal to 0 and MUST be less than **count** of the **CT_OlapSlicerCacheLevelsData** element specified by the **CT_SlicerCacheDefinition** element specified by **cache**. If the OLAP hierarchy has an **OLAP All level**, the value MUST NOT be 0.

If the slicer source data is non-OLAP, this attribute MUST NOT exist.

style: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the slicer style of the slicer view. If this **field** exists, this string MUST match the **name** attribute of a **CT_SlicerStyle** element within this workbook or MUST be equal to one of the built-in slicer style names:

Built-in slicer style names
SlicerStyleLight1
SlicerStyleLight2
SlicerStyleLight3
SlicerStyleLight4
SlicerStyleLight5
SlicerStyleLight6
SlicerStyleOther1
SlicerStyleOther2
SlicerStyleDark1
SlicerStyleDark2
SlicerStyleDark3
SlicerStyleDark4
SlicerStyleDark5
SlicerStyleDark6

lockedPosition: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the slicer view is locked.

Value	Meaning
"true"	The slicer view is locked.
"false"	The slicer view is not locked.

rowHeight: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the **row** height of the slicer view in **English Metric Units (EMUs)**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Slicer">
  <xsd:sequence>
    <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="x:ST Xstring" use="required"/>
  <xsd:attribute ref="xr10:uid" use="optional"/>
  <xsd:attribute name="cache" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="caption" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="startItem" type="xsd:unsignedInt" use="optional" default="0"/>
  <xsd:attribute name="columnCount" type="xsd:unsignedInt" use="optional" default="1"/>
  <xsd:attribute name="showCaption" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="level" type="xsd:unsignedInt" use="optional" default="0"/>
  <xsd:attribute name="style" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="lockedPosition" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="rowHeight" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.69 CT_Slicer

Target namespace: http://schemas.microsoft.com/office/drawing/2010/slicer

Referenced by: slicer

This complex type specifies which slicer view is associated with this drawing element.

Child Elements:

extLst: A **CT_OfficeArtExtensionList** ([ISO/IEC29500-4:2016] section A.4.1) element that specifies future extensibility for this element.

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the slicer view that is associated with this drawing element. The value of this attribute MUST match the value of the **name** attribute of a **slicer** element within the **CT_Slicers** element for the current **worksheet**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Slicer">
  <xsd:sequence>
    <xsd:element name="extLst" type="a:CT OfficeArtExtensionList" minOccurs="0"
maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:string" use="required"/>
</xsd:complexType>
```

See section 5.2 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.70 CT_SlicerCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: slicerCacheDefinition

A complex type that specifies a [slicer cache](#).

Child Elements:

pivotTables: A **CT_SlicerCachePivotTables** element (section [2.6.72](#)) that specifies a group of **CT_SlicerCachePivotTable** elements (section [2.6.73](#)) that specify the PivotTable ([[ISO/IEC29500-1:2016]](#) section 18.10) views that are filtered by the slicer cache (section [2.1.4](#)).

data: A **CT_SlicerCacheData** element (section [2.6.71](#)) that specifies a **data source** for the slicer cache.

extLst: A **CT_ExtensionList** element, as specified in [[ISO/IEC29500-4:2016]](#) section A.2, that specifies future extensibility for this element.

Attributes:

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the slicer cache. MUST adhere to the name production rule provided in section [2.2.2](#). MUST be a unique case-insensitive name within the scope of **defined names**.

xr10:uid: An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the slicer cache. If any instance of this type specifies this attribute, then all instances MUST specify it, and the values MUST be distinct.

sourceName: An **ST_Xstring** attribute that specifies the **MDX unique name** or **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) cache **field** of the associated PivotTable **PivotCache** used by the slicer cache.

▪ If the slicer source data (section [2.3.2.1.1](#))is a non-**OLAP** data source, the value of this attribute MUST be equal to the **name** attribute of a **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) element in the list of cache fields, as specified in section [2.3.2.1.2](#), and specify a **PivotTable** cache field. The specified **CT_CacheField** MUST have a **serverField** attribute equal to "false". The **includeNewItemsInFilter** attributes of the **CT_PivotField** ([ISO/IEC29500-4:2016] section A.2) elements of all included **CT_CacheField** elements MUST be equal.

▪ If the slicer source data is an OLAP data source, the value MUST be equal to the value of the **uniqueName** attribute in one of the **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) elements within the associated OLAP pivot cache, as specified in section [2.3.2.1.4](#), and specify a MDX unique name. The following attributes of the **CT_CacheHierarchy** element MUST be "false": **measure**, **set**, and **measures**. The **CT_PivotHierarchy** ([ISO/IEC29500-4:2016] section A.2) element with a zero-based index in the list of **CT_PivotHierarchy** elements specified by the **CT_PivotHierarchies** ([ISO/IEC29500-4:2016] section A.2) equal to the zero-based index of the **CT_CacheHierarchy** element in the list of **CT_CacheHierarchy** elements specified by **CT_CacheHierarchies** ([ISO/IEC29500-4:2016] section A.2) MUST have an **includeNewItemsInFilter** attribute equal to "false".

The following W3C XML Schema ([[XMLSCHEMA1/2]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerCacheDefinition">
  <xsd:sequence>
    <xsd:element name="pivotTables" type="CT SlicerCachePivotTables" minOccurs="0"
maxOccurs="1"/>
    <xsd:element name="data" type="CT SlicerCacheData" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="x:ST Xstring" use="required"/>
  <xsd:attribute ref="xr10:uid" use="optional"/>
  <xsd:attribute name="sourceName" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.71 CT_SlicerCacheData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerCacheDefinition

A complex type that specifies a **data source** for the slicer cache.

Child Elements:

olap: A **CT_OlapSlicerCache** element that specifies an OLAP data source.

tabular: A **CT_TabularSlicerCache** element that specifies a non-OLAP data source.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerCacheData">
  <xsd:choice minOccurs="1" maxOccurs="1">
    <xsd:element name="olap" type="CT_OlapSlicerCache" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="tabular" type="CT_TabularSlicerCache" minOccurs="1" maxOccurs="1"/>
  </xsd:choice>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.72 CT_SlicerCachePivotTables

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: slicerCachePivotTables, CT_SlicerCacheDefinition

A complex type that specifies a group of **CT_SlicerCachePivotTable** elements that specify the PivotTable ([ISO/IEC29500-1:2016] section 18.10) views that are filtered by the slicer cache.

Child Elements:

pivotTable: A **CT_SlicerCachePivotTable** element that specifies the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view that is filtered. The list of **pivotTable** child elements MUST NOT contain duplicates. The **showCalcMbrs** attribute of all **CT_PivotTableDefinition** ([ISO/IEC29500-4:2016] section A.2) elements associated with PivotTables ([ISO/IEC29500-1:2016] section 18.10) that are specified by **pivotTable** child elements MUST have the same value.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SlicerCachePivotTables">
  <xsd:sequence>
    <xsd:element name="pivotTable" type="CT_SlicerCachePivotTable" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.73 CT_SlicerCachePivotTable

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerCachePivotTables

A complex type that specifies a PivotTable ([ISO/IEC29500-1:2016] section 18.10) view filtered by a slicer cache.

Attributes:

tabId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the **unique identifier (UID)** of the **worksheet** that contains the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view specified by the **name** attribute. MUST match the **sheetId** of an existing **sheet** ([ISO/IEC29500-4:2016] section A.2) element within the **workbook**. MUST be ignored if the PivotTable specified by the name attribute is a Non-Worksheet PivotTable.

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view on the worksheet specified by **tabId** or a Non-Worksheet PivotTable. MUST match the **name** attribute of an existing **pivotTableDefinition** element in the worksheet. The **createdVersion** attribute of the **CT_PivotTableDefinition** ([ISO/IEC29500-4:2016] section A.2) element that defines the specified PivotTable ([ISO/IEC29500-1:2016] section 18.10) MUST be greater than or equal to 3. **Field showCalcMbrs** of all PivotTable ([ISO/IEC29500-1:2016] section 18.10) MUST have the same value. Field **calculatedMembersInFilters** of CT_PivotTableDefinition of all PivotTable ([ISO/IEC29500-1:2016] section 18.10) MUST have the same value.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT SlicerCachePivotTable">
  <xsd:attribute name="tabId" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.74 CT_OlapSlicerCacheItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCacheRange

This element specifies an OLAP slicer item of the **OLAP level** in the **OLAP hierarchy** specified by the ancestor **CT_OlapSlicerCacheLevelData** element. This element contains a list of all ancestor **OLAP members** of this OLAP slicer item in the OLAP hierarchy.

Child Elements:

p: A **CT_OlapSlicerCacheItemParent** element that specifies the OLAP members that are ascendants of the OLAP slicer item specified by this element. The first element in this list specifies the OLAP member that is the parent of the OLAP slicer item specified by this element. Each subsequent element in this list specifies an ascendant OLAP member in the next level up the OLAP hierarchy.

Attributes:

n: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **MDX unique name** of the OLAP member associated with the OLAP slicer item specified by this element.

c: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the caption of the OLAP slicer item specified by this element.

nd: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the OLAP slicer item specified by this element has no data associated with it. This attribute MUST NOT exist if the **crossFilter** attribute of the ancestor element **CT_OlapSlicerCacheLevelData** is "none". For more information, see Slicer Cross Filtering.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OlapSlicerCacheItem">
  <xsd:sequence>
    <xsd:element name="p" type="CT_OlapSlicerCacheItemParent" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="c" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="nd" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.75 CT_OlapSlicerCacheItemParent

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCacheItem, CT_OlapSlicerCacheSelection

This element specifies an ancestor **OLAP member** of the OLAP member specified by **CT_OlapSlicerCacheItem** or **CT_OlapSlicerCacheSelection** element that contains this element.

Attributes:

n: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **MDX unique name** of the OLAP member specified by this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OlapSlicerCacheItemParent">
  <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.76 CT_OlapSlicerCacheRange

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCacheRanges

A complex type that specifies a collection of cached OLAP slicer items in the **OLAP level** specified by the ancestor **CT_OlapSlicerCacheLevelData** element.

Child Elements:

i: A **CT_OlapSlicerCacheItem** element that specifies an OLAP slicer item in the OLAP level specified by the **CT_OlapSlicerCacheLevelData** element that is part of this range. The number of **CT_OlapSlicerCacheItem** child elements MUST be greater than 0 and equal to or less than 1,000.

Attributes:

startItem: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the zero-based index of the **OLAP member** on this OLAP level for the first item in this range. The order of the OLAP slicer item is determined by the current **sort order** and current slicer cross filtering setting applied to all OLAP slicer items on this OLAP level. The value of the starting position MUST be 0 or MUST be a multiple of 1,000. See Slicer Items for more information.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OlapSlicerCacheRange">
  <xsd:sequence>
    <xsd:element name="i" type="CT_OlapSlicerCacheItem" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="startItem" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.77 CT_OlapSlicerCacheRanges

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCacheLevelData

A complex type that specifies the cached OLAP slicer items for the **OLAP level** specified by the **CT_OlapSlicerCacheLevelData** element.

Child Elements:

range: A **CT_OlapSlicerCacheRange** element that specifies a range of OLAP slicer items for this OLAP level within the **OLAP hierarchy** specified by this slicer cache.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OlapSlicerCacheRanges">
  <xsd:sequence>
    <xsd:element name="range" type="CT_OlapSlicerCacheRange" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.78 CT_OlapSlicerCacheLevelData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCacheLevelsData

A complex type that specifies the properties of an **OLAP level** in the **OLAP hierarchy** specified by this [slicer cache](#) and specifies the **OLAP members** that are cached for this OLAP level within the OLAP hierarchy specified by this slicer cache.

Child Elements:

ranges: A **[CT_OlapSlicerCacheRanges](#)** element that specifies cached [OLAP slicer items](#) for the OLAP level specified by this element.

Attributes:

uniqueName: An **ST_Xstring** ([\[ISO/IEC29500-1:2016\]](#) section 22.9.2.19) attribute that specifies the **MDX unique name** of the OLAP level specified by this element within the OLAP hierarchy specifies with this slicer cache. The length of this string MUST be at least 1 character and MUST NOT exceed 32,767 characters.

sourceCaption: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the caption of the OLAP level specified by this element within the OLAP hierarchy specified with this cache. The length of this string MUST NOT exceed 65,535 characters.

count: An **unsignedInt** ([\[XMLSCHEMA2/2\]](#) section 3.3.22) attribute that specifies the total number of OLAP members in the OLAP **data source** in this OLAP level within the OLAP hierarchy specified by this slicer cache. The default value is zero.

sortOrder: An **[ST_OlapSlicerCacheSortOrder](#)** attribute that specifies how the OLAP slicer items for the OLAP level specified by this element are sorted in the [slicer view](#).

crossFilter: An **[ST_SlicerCacheCrossFilter](#)** attribute that specifies how the OLAP slicer items that are used in [slicer cross filtering](#) are displayed.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT OlapSlicerCacheLevelData">
  <xsd:sequence>
    <xsd:element name="ranges" type="CT_OlapSlicerCacheRanges" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="uniqueName" type="x:ST Xstring" use="required"/>
  <xsd:attribute name="sourceCaption" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="sortOrder" type="ST_OlapSlicerCacheSortOrder" use="optional"
default="natural"/>
  <xsd:attribute name="crossFilter" type="ST_SlicerCacheCrossFilter" use="optional"
default="showItemsWithDataAtTop"/>
</xsd:complexType>
```

See section [5.4](#) for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.79 CT_OlapSlicerCacheLevelsData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: [CT_OlapSlicerCache](#)

A complex type that specifies a list of **OLAP levels** of the **OLAP hierarchy** specified by this [slicer cache](#).

Child Elements:

level: A **CT_OlapSlicerCacheLevelData** element that specifies properties of an OLAP level in the OLAP hierarchy specified by this slicer cache.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of **level** child elements of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OlapSlicerCacheLevelsData">
  <xsd:sequence>
    <xsd:element name="level" type="CT_OlapSlicerCacheLevelData" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.80 CT_OlapSlicerCache

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerCacheData

A complex type that specifies the associated **OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache, and specifies OLAP Slicer Items. See Slicer Cache Relationship to PivotCache for more details.

Child Elements:

levels: A **CT_OlapSlicerCacheLevelsData** element that specifies a list of **OLAP levels** of the OLAP **hierarchy** specified by this slicer cache.

selections: A **CT_OlapSlicerCacheSelections** element that specifies a list of OLAP Slicer Items that are selected.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

pivotCacheId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the associated OLAP PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache. MUST be equal to the **pivotCacheId** attribute of an existing **CT_PivotCacheDefinition** element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OlapSlicerCache">
  <xsd:sequence>
    <xsd:element name="levels" type="CT_OlapSlicerCacheLevelsData" minOccurs="1"
maxOccurs="1"/>
    <xsd:element name="selections" type="CT_OlapSlicerCacheSelections" minOccurs="1"
maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="required"/>
```

```
    </xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.81 CT_OlapSlicerCacheSelections

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCache

A complex type that specifies the OLAP slicer items that are selected in the slicer cache.

Child Elements:

selection: A **CT_OlapSlicerCacheSelection** element that specifies an OLAP slicer item that is selected in the slicer cache.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of **selection** child elements of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_OlapSlicerCacheSelections">
      <xsd:sequence>
        <xsd:element name="selection" type="CT_OlapSlicerCacheSelection" minOccurs="1"
    maxOccurs="unbounded"/>
      </xsd:sequence>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
    </xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.82 CT_OlapSlicerCacheSelection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCacheSelections

A complex type that specifies an individual OLAP slicer item that is selected for filtering. This complex type also specifies the ancestor **OLAP members** of the OLAP member associated with the OLAP slicer item in the **OLAP hierarchy**.

Child Elements:

p: A **CT_OlapSlicerCacheItemParent** element that specifies OLAP members that are the ancestors of the OLAP member associated with the OLAP slicer item specified by this element. The first element in this list specifies the OLAP member that is the parent of the OLAP member associated with the OLAP slicer item specified by this element. Each subsequent element in this list specifies an ancestor OLAP member in the next level up the OLAP hierarchy, excluding the **OLAP All member**.

Attributes:

n: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **MDX unique name** of the OLAP member associated with the OLAP slicer item specified by this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_OlapSlicerCacheSelection">
  <xsd:sequence>
    <xsd:element name="p" type="CT OlapSlicerCacheItemParent" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.83 CT_TabularSlicerCache

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerCacheData

A complex type that specifies non-OLAP slicer items that are cached within this slicer cache and properties of the slicer cache specific to non-OLAP slicer items.

Child Elements:

items: A **CT_TabularSlicerCacheItems** element that specifies non-OLAP slicer items that are cached within this slicer cache.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

pivotCacheId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the associated non-**OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache. MUST match the **pivotCacheId** attribute of an existing **CT_PivotCacheDefinition** element.

sortOrder: An **ST_TabularSlicerCacheSortOrder** attribute that specifies how the non-OLAP slicer items are sorted in the slicer view.

customListSort: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether **custom lists** are used when sorting the non-OLAP slicer items.

Value	Meaning
"false"	Custom lists are not used when sorting the non-OLAP slicer items.
"true"	Custom lists are used when sorting the non-OLAP slicer items.

showMissing: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether non-OLAP slicer items that correspond to unused PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache items that existed previously, but are no longer present in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) **source data**, are displayed.

Value	Meaning
"false"	The unused non-OLAP slicer items are not displayed.

Value	Meaning
"true"	The unused non-OLAP slicer items are displayed.

crossFilter: An **ST_SlicerCacheCrossFilter** attribute that specifies how the non-OLAP slicer items that are used in slicer cross filtering are displayed.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TabularSlicerCache">
  <xsd:sequence>
    <xsd:element name="items" type="CT_TabularSlicerCacheItems" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="sortOrder" type="ST_TabularSlicerCacheSortOrder" use="optional"
default="ascending"/>
  <xsd:attribute name="customListSort" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="showMissing" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="crossFilter" type="ST_SlicerCacheCrossFilter" use="optional"
default="showItemsWithDataAtTop"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.84 CT_TabularSlicerCacheItems

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TabularSlicerCache

A complex type that specifies non-OLAP slicer items that are cached within this slicer cache.

Child Elements:

i: A **CT_TabularSlicerCacheItem** element that specifies a non-OLAP slicer item that is cached within this slicer cache. All **CT_TabularSlicerCacheItem** elements within this slicer cache MUST have unique **x** attributes. At least one **CT_TabularSlicerCacheItem** element MUST have **s** attribute be "true".

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of **i** child elements of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TabularSlicerCacheItems">
  <xsd:sequence>
    <xsd:element name="i" type="CT_TabularSlicerCacheItem" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.85 CT_TabularSlicerCacheItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TabularSlicerCacheItems

A complex type that specifies a non-OLAP slicer item that is cached within this slicer cache.

Attributes:

x: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies an index of the associated PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item in the associated **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) cache **field**. MUST be within the range of items as specified by the **count** attribute of the **CT_PivotCacheRecords** ([ISO/IEC29500-4:2016] section A.2) element of the associated non-**OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache specified by the **pivotCacheId** attribute of the **CT_TabularSlicerCache** element that is an ancestor of this element.

s: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether a non-OLAP slicer item is **selected**.

Value	Meaning
"true"	A non-OLAP slicer item is selected.
"false"	A non-OLAP slicer item is not selected.

nd: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether a non-OLAP slicer item does not have data associated with it. This attribute MUST NOT exist if the **crossFilter** attribute of the **CT_TabularSlicerCache** element is equal to "none". For more information, see Slicer Cross Filtering.

Value	Meaning
"true"	A non-OLAP slicer item does not have data associated with it.
"false"	A non-OLAP slicer item has data associated with it.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TabularSlicerCacheItem">
  <xsd:attribute name="x" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="s" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="nd" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.86 CT_PivotTableReferences

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: [pivotTableReferences](#)

A complex type that specifies a list of PivotTable ([ISO/IEC29500-1:2016] section 18.10) part identifiers for [Non-Worksheet PivotTables](#). MUST contain fewer than 2^{31} elements.

Child Elements:

pivotTableReference: A [CT_PivotTableReference](#) element that specifies a PivotTable part identifier of a Non-Worksheet PivotTable.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotTableReferences">
  <xsd:sequence>
    <xsd:element name="pivotTableReference" type="CT_PivotTableReference" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section [5.3](#) for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.87 CT_PivotTableReference

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: [CT_PivotTableReferences](#)

A complex type that specifies a [relationship](#) identifier to a PivotTable ([ISO/IEC29500-1:2016] section 18.10) part in this **workbook**. The PivotTable specified by the element **pivotTableDefinition** ([ISO/IEC29500-1:2016] section 18.10.1.73) identified by this type MUST be a [Non-Worksheet PivotTable](#) and MUST satisfy the following criteria.

- The **ref** attribute of the child element **location** ([ISO/IEC29500-1:2016] section 18.10.1.49) MUST begin with "A1".

- The **enableEdit** attribute of the **CT_PivotTableDefinition** element, as specified in section [2.6.32](#), MUST NOT exist or MUST be "false" if exists; **CT_PivotEdits** and **CT_PivotChanges** elements MUST NOT exist in this part.

- The PivotTable name specified by the **name** attribute of the element **pivotTableDefinition** ([ISO/IEC29500-1:2016] section 18.10.1.73), MUST be unique among all the PivotTables in the workbook.

- There MUST be a child **CT_PivotCache** ([ISO/IEC29500-4:2016] section A.2) element within the **pivotCaches** element, specified by section [2.4.39](#), with the attribute **cacheID** having the same value as the **cacheId** attribute of the element **pivotTableDefinition** ([ISO/IEC29500-1:2016] section 18.10.1.73).

- The PivotTable MUST NOT have **CT_ConditionalFormats** element as specified by section [2.6.49](#).

Attributes:

r:id: An **ST_RelationshipId** ([ISO/IEC29500-1:2016] section 22.8.2.1) attribute that specifies a relationship identifier to a PivotTable part in this workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT PivotTableReference">
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.88 CT_QueryTable

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: queryTable

A complex type that specifies extended properties of a **query table** ([ISO/IEC29500-1:2016] section 18.12).

Attributes:

clipped: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether a query table ([ISO/IEC29500-1:2016] section 18.12) did not fit to worksheet and was clipped.

Value	Meaning
"true"	A query table ([ISO/IEC29500-1:2016] section 18.12) did not fit to the worksheet and was clipped.
"false"	A query table ([ISO/IEC29500-1:2016] section 18.12) did not fit to the worksheet and was not clipped.

sourceDataName: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the primary **data connection** for the query table. For more details, see **connection** ([ISO/IEC29500-1:2016] section 18.13.1)

drillThrough: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether a query table ([ISO/IEC29500-1:2016] is a result of **drillthrough** operation on **OLAP data source**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_QueryTable">
  <xsd:attribute name="clipped" use="optional" default="false" type="xsd:boolean"/>
  <xsd:attribute name="sourceDataName" type="xsd:string" use="optional"/>
  <xsd:attribute name="drillThrough" use="optional" default="false" type="xsd:boolean"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.89 CT_WebExtensions

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: webExtensions

A complex type that specifies a list of CT_WebExtension elements. The list of CT_WebExtension elements specifies all the bindings for web extensions, as specified by [MS-OWEXML] section 1.3, on the **worksheet**.

Child Elements:

webExtension: A CT_WebExtension element that specifies a binding for a web extension, as specified by [MS-OWEXML] section 1.3, on the worksheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_WebExtensions">
  <xsd:sequence>
    <xsd:element name="webExtension" type="CT_WebExtension" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.90 CT_WebExtension

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_WebExtensions

A complex type that specifies a binding for a web extension, as specified by [MS-OWEXML] section 1.3, on the **worksheet**.

Child Elements:

xm:f: An **f** element that specifies the data range for the Binding. The formula MUST adhere to the grammar specified in Section Formulas, with the following restrictions:

- MUST follow the ref-nospace-expression rule.

- MUST NOT use the bang-reference, bang-name, sheet-range-reference, or local-cell-reference production rules.

Attributes:

appRef: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies a unique identifier for a binding for a web extension. This value MUST be equal to the **appref field** of a **CT_OsfWebExtensionBinding** element as specified by [MS-OWEXML] section 2.2.3.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_WebExtension">
  <xsd:sequence>
    <xsd:element ref="xm:f" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="appRef" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.91 CT_Connection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: connection

A complex type that specifies the extended properties of an external connection ([ISO/IEC29500-1:2016] section 18.13). See section 2.2.4.1 for how this element integrates with the Office Open XML file formats specified in [ISO/IEC29500-1:2016].

Child Elements:

textPr: A CT_TextPr ([ISO/IEC29500-4:2016] section 18.13.12) element that specifies properties for data model data source text importation.

If this element is present, then the **type** attribute of the ancestor **CT_Connection** element, as specified in [ISO/IEC29500-4:2016] section A.2, MUST be equal to "103".

modelTextPr: A CT_ModelTextPr element that specifies a data model data source text importation ([MS-XLSB] section 2.2.8.9.4) properties in addition to those specified in **textPr** element.

If this element is present, then:

- the **type** attribute of the ancestor **CT_Connection** element, as specified in [ISO/IEC29500-4:2016] section A.2, MUST be equal to "103".

- Ancestor **CT_Connection** element MUST contain **textPr** element.

rangePr: A CT_RangePr element that specifies data model data source Worksheet Data connection ([MS-XLSB] section 2.2.8.9.3) properties.

If this element is present, then the **type** attribute of the ancestor **CT_Connection** element, as specified in [ISO/IEC29500-4:2016] section A.2, MUST be equal to "102".

oledbPr: A CT_OledbPr element that specifies data model data source OLE DB connection ([MS-XLSB] section 2.2.8.9.1) properties.

If this element is present, then the **type** attribute of the ancestor **CT_Connection** element, as specified in [ISO/IEC29500-4:2016] section A.2, MUST be equal to "100".

dataFeedPr: A CT_DataFeedPr element that specifies data model data source Data Feed connection ([MS-XLSB] section 2.2.8.9.2) properties.

If this element is present, then the **type** attribute of the ancestor **CT_Connection** element, as specified in [ISO/IEC29500-4:2016] section A.2, MUST be equal to "101".

Attributes:

id: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the identifier of the Data Model data source. The string MUST be less than or equal to 65535 characters in length. The string length MUST be equal to zero characters if the **model** attribute equals "true".

model: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this connection is a connection to the **spreadsheet data model.** If this element equals "true", the **type** attribute of the ancestor **CT_Connection** element, as specified in [ISO/IEC29500-4:2016] section A.2, MUST be equal to "5".

excludeFromRefreshAll: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this connection is not to be refreshed on Refresh All.

Value	Meaning
"true"	This connection is not to be refreshed on Refresh All.
"false"	This connection is to be refreshed on Refresh All.

autoDelete: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this connection will be automatically deleted when all data features which use it are deleted.

Value	Meaning
"true"	This connection will be automatically deleted when all data features that use it are deleted.
"false"	This connection will not be automatically deleted when all data features that use it are deleted.

usedByAddin: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this connection is used by an addin component and will not be deleted with any data feature that uses it.

Value	Meaning
"true"	This connection is used by an addin component.
"false"	This connection is not used by an addin component.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Connection">
  <xsd:sequence>
    <xsd:element name="textPr" minOccurs="0" maxOccurs="1" type="x:CT_TextPr"/>
    <xsd:element name="modelTextPr" minOccurs="0" maxOccurs="1" type="CT_ModelTextPr"/>
    <xsd:element name="rangePr" minOccurs="0" maxOccurs="1" type="CT_RangePr"/>
    <xsd:element name="oledbPr" minOccurs="0" maxOccurs="1" type="CT_OledbPr"/>
    <xsd:element name="dataFeedPr" minOccurs="0" maxOccurs="1" type="CT_DataFeedPr"/>
  </xsd:sequence>
  <xsd:attribute name="id" use="required" type="x:ST_Xstring"/>
  <xsd:attribute name="model" type="xsd:boolean" default="false" use="optional"/>
  <xsd:attribute name="excludeFromRefreshAll" type="xsd:boolean" default="false"
use="optional"/>
  <xsd:attribute name="autoDelete" type="xsd:boolean" default="false" use="optional"/>
  <xsd:attribute name="usedByAddin" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.92 CT_CalculatedMemberExt

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

This element adds an element for supporting new properties for calculated members.

Child Elements:

calculatedMember: A **CT_CalculatedMember** (section 2.6.93) element that specifies a definition for a custom member or measure that is applied to a pivot table.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CalculatedMemberExt">
  <xsd:sequence>
    <xsd:element ref="calculatedMember" minOccurs="1" maxOccurs="1"/>
```

```
      </xsd:sequence>
   </xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.93 CT_CalculatedMember

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_CalculatedMemberExt, calculatedMember

This element adds new properties for supporting calculated members.

Attributes:

measureGroup: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the measure group that this calculated member is associated with if **measure** is TRUE.

numberFormat: An **ST_CalcMemNumberFormat** (see section 2.7.25) attribute that specifies the formatting type of the calculated member.

measure: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this calculated member is also a calculated measure.

Value	Meaning
"true"	This calculated member is also a calculated measure.
"false"	This calculated member is not a calculated measure.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CalculatedMember">
  <xsd:attribute name="measureGroup" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="numberFormat" type="ST_CalcMemNumberFormat" use="optional"
default="default"/>
  <xsd:attribute name="measure" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.94 CT_FieldListActiveTabTopLevelEntity

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_PivotTableUISettings

A complex type which specifies a top level object in the hierarchy of objects displayed in the **PivotTable field list**.

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies name of the object in the PivotTable field list.

type: An **unsignedInt** attribute that specifies the type of this top level object. MUST be specified. MUST be one of the values in the following table:

Value	Object Type
0	OLAP Dimension. The **name** attribute of this element MUST be the **MDX unique name** of the **dimension**.
1	Workbook Table. The **name** attribute of this element MUST be the name of the workbook table.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_FieldListActiveTabTopLevelEntity">
  <xsd:attribute name="name" use="required" type="xsd:string"/>
  <xsd:attribute name="type" use="optional" default="0" type="xsd:unsignedInt"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.95 CT_PivotFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: pivotFilter

A complex type that specifies the extended properties of a **CT_PivotFilter** ([ISO/IEC29500-4:2016] section A.2) element.

Attributes:

useWholeDay: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **filter** ([ISO/IEC29500-1:2016] section 18.10.1.33) element extended by this type uses whole days in its filtering criteria. MUST be false for **filters** for which the value of the attribute **type** ([ISO/IEC29500-1:2016] section 18.10.1.33) is not one of the values mentioned in the table below. MUST be true if the value of the **name** attribute of the containing **CT_PivotTableDefinition** ([ISO/IEC29500-4:2016] section A.2) element is equal to the value of the **name** (section 2.6.114) attribute of at least one **CT_ TimelineCachePivotTable** (section 2.6.114) element in the **Timeline cache** (section 2.1.7) and the value of the attribute **type** of the containing **filter** element is one of the following.

Enumeration Value
dateBetween (Date Between)
dateEqual (Date Equals)
dateNewerThan (Date Newer Than)
dateNewerThanOrEqual (Date Newer Than or Equal To)
dateNotBetween (Date Not Between)
dateNotEqual (Date Does Not Equal)
dateOlderThan (Date Older Than)

Enumeration Value
dateOlderThanOrEqual (Date Older Than Or Equal)
lastMonth (Last Month)
lastQuarter (Last Quarter)
lastWeek (Last Week)
lastYear (Last Year)
M1 (Dates in January)
M10 (Dates in October)
M11 (Dates in November)
M12 (Dates in December)
M2 (Dates in February)
M3 (Dates in March)
M4 (Dates in April)
M5 (Dates in May)
M6 (Dates in June)
M7 (Dates in July)
M8 (Dates in August)
M9 (Dates in September)
nextMonth (Next Month)
nextQuarter (Next Quarter)
nextWeek (Next Week)
nextYear (Next Year)
percent (Percent)
Q1 (First Quarter)
Q2 (Second Quarter)
Q3 (Third Quarter)
Q4 (Fourth Quarter)
sum (Sum)
thisMonth (This Month)
thisQuarter (This Quarter)
thisWeek (This Week)
thisYear (This Year)
today (Today)

Enumeration Value
tomorrow (Tomorrow)

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT PivotFilter">
  <xsd:attribute name="useWholeDay" type="xsd:boolean" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.96 CT_PivotTableUISettings

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: pivotTableUISettings

Specifies state for user interface used to construct and manipulate a PivotTable.

Child Elements:

activeTabTopLevelEntity: A CT_FieldListActiveTabTopLevelEntity element that specifies a **field** that appears in the user's working set of fields in the **PivotTable field list**.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

sourceDataName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the primary **data connection** for the **PivotTable**. See **connection** ([ISO/IEC29500-1:2016] section 18.13.1)

relNeededHidden: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the user closed the relationship warning for this PivotTable.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotTableUISettings">
  <xsd:sequence>
    <xsd:element name="activeTabTopLevelEntity" type="CT_FieldListActiveTabTopLevelEntity"
minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="sourceDataName" type="xsd:string" use="optional"/>
  <xsd:attribute name="relNeededHidden" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.97 CT_TableSlicerCache

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: tableSlicerCache

A complex type that specifies properties of the slicer cache specific to table slicer items.

Child Elements:

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

tableId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the associated **Table** ([ISO/IEC29500-1:2016] section 18.5.1.2). MUST match **id** attribute of an existing **Table** ([ISO/IEC29500-1:2016] section 18.5.1.2) element.

column: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies associated **Table Column** ([ISO/IEC29500-1:2016] section 18.5.1.3). MUST match **id** attribute of an existing **tableColumn** element representing a **column** in **Table** specified by the **tableId** attribute.

sortOrder: An ST_TabularSlicerCacheSortOrder attribute that specifies how the table slicer items are sorted in the slicer view.

customListSort: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether **custom lists** are used when sorting the table slicer items.

Value	Meaning
"false"	Custom lists are not used when sorting the table slicer items.
"true"	Custom lists are used when sorting the table slicer items.

crossFilter: An ST_SlicerCacheCrossFilter attribute that specifies how the table slicer items that are used in slicer cross filtering are displayed.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT TableSlicerCache">
  <xsd:sequence>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="tableId" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="column" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="sortOrder" type="x14:ST TabularSlicerCacheSortOrder" use="optional"
default="ascending"/>
  <xsd:attribute name="customListSort" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="crossFilter" type="x14:ST_SlicerCacheCrossFilter" use="optional"
default="showItemsWithDataAtTop"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.98 CT_TimelineCacheRefs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: timelineCacheRefs

A complex type that specifies a list of Timeline cache part identifiers for the **workbook**. MUST contain fewer than 2^{31} elements.

Child Elements:

timelineCacheRef: A CT_TimelineCacheRef element that specifies a Timeline cache part identifier in this workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineCacheRefs">
  <xsd:sequence>
    <xsd:element name="timelineCacheRef" type="CT_TimelineCacheRef" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.99 CT_TimelineCacheRef

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineCacheRefs

A complex type that specifies a **Relationship** (section 1.4) identifier to a **Timeline Cache** (section 2.3.5.1) part in this **workbook**.

Attributes:

r:id: An **ST_RelationshipId** ([ISO/IEC29500-1:2016] section 22.8.2.1) attribute that specifies a **Relationship** (section 1.4) identifier to a **Timeline Cache** (section 2.3.5.1) part in this workbook.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineCacheRef">
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.100   CT_TimelineRefs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: timelineRefs

CT_TimelineRefs is a complex type that specifies a list of Timeline (section 2.3.5) part identifiers for the **worksheet**. MUST contain exactly one Timeline part identifier.

Child Elements:

timelineRef: A **CT_TimelineRef** element (section 2.6.101) that specifies the Timeline (section 2.3.5) part identifier for the worksheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineRefs">
  <xsd:sequence>
    <xsd:element name="timelineRef" type="CT_TimelineRef" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.101   CT_TimelineRef

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineRefs

A complex type that specifies a relationship identifier of the part that contains the Timelines in this **worksheet**.

Attributes:

r:id: An **ST_RelationshipId** ([ISO/IEC29500-1:2016] section 22.8.2.1) attribute that specifies a relationship identifier of the part that contains the Timelines in this worksheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineRef">
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.102   CT_CacheHierarchy

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: cacheHierarchy

CT_CacheHierarchy is a complex type which specifies additional properties for an **OLAP measure**.

Attributes:

aggregatedColumn: An **int** attribute that specifies the zero-based index of PivotTable cache hierarchy which corresponds to this OLAP measure. The referenced **CT_CacheHierarchy** ([ISO/IEC29500-4:2016] section A.2) element specifies the PivotTable cache hierarchy that this OLAP measure aggregates. MUST only be specified if the **measure** attribute of this cache hierarchy is "true". The value MUST match the index of an existing cache hierarchy in **CT_CacheHierarchies** ([ISO/IEC29500-4:2016]) collection or be equal -1 if this OLAP measure is not an implicit measure which aggregates a cache hierarchy.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CacheHierarchy">
  <xsd:attribute name="aggregatedColumn" use="required" type="xsd:int"/>
```

```
    </xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.103 CT_SlicerCacheHideNoData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: slicerCacheHideItemsWithNoData

A complex type that specifies the extended properties of a slicer cache, as specified in section 2.3.2.1.

Child Elements:

slicerCacheOlapLevelName: A CT_SlicerCacheOlapLevelName element that specifies the properties of an **OLAP level** in the **OLAP hierarchy** specified by the ancestor slicer cache. slicer items with no data in this **OLAP level** are not displayed.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of **slicerCacheOlapLevelName** child elements of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_SlicerCacheHideNoData">
      <xsd:sequence>
        <xsd:element name="slicerCacheOlapLevelName" type="CT_SlicerCacheOlapLevelName"
    minOccurs="0" maxOccurs="unbounded"/>
      </xsd:sequence>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
    </xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.104 CT_SlicerCacheOlapLevelName

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_SlicerCacheHideNoData

A complex type that specifies the properties of an **OLAP level** in the **OLAP hierarchy** specified by the ancestor slicer cache. slicer items with no data in this **OLAP level** are not displayed.

Attributes:

uniqueName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **MDX unique name** of the OLAP level specified by this element within the OLAP hierarchy specified with this slicer cache. The length of this string MUST be at least 1 character and MUST NOT exceed 32,767 characters.

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the total number of hidden slicer items in this OLAP level within the OLAP hierarchy specified by this slicer cache.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT SlicerCacheOlapLevelName">
  <xsd:attribute name="uniqueName" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.105   CT_TimelineStyles

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: timelineStyles

A complex type that specifies a group of Timeline Styles and the default Timeline Style to apply to Timelines.

Child Elements:

timelineStyle: A CT_TimelineStyle element that specifies a Timeline Style.

Attributes:

defaultTimelineStyle: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the default Timeline Style to apply to Timelines. The length of the string MUST be greater than or equal to 1 character and less than or equal to 255 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT TimelineStyles">
  <xsd:sequence>
    <xsd:element name="timelineStyle" type="CT_TimelineStyle" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="defaultTimelineStyle" type="xsd:string" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.106   CT_TimelineStyleElements

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineStyle

A complex type that specifies the list of table style ([ISO/IEC29500-1:2016] section 18.8) elements of a Timeline Style that are specific to Timelines.

Child Elements:

timelineStyleElement: A CT_TimelineStyleElement element that specifies a table style ([ISO/IEC29500-1:2016] section 18.8) element of a timeline style that is specific to timelines.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineStyleElements">
  <xsd:sequence>
```

```
      <xsd:element name="timelineStyleElement" type="CT_TimelineStyleElement" minOccurs="1"
   maxOccurs="unbounded"/>
      </xsd:sequence>
   </xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.107   CT_TimelineStyle

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineStyles

CT_TimelineStyle specifies table style elements, as specified in [ISO/IEC29500-1:2016] section 18.8, of the timeline style, as specified in section Timeline Styles, that are specific to timelines, as specified in section Timelines.

Child Elements:

timelineStyleElements: A CT_TimelineStyleElements, as specified in section Timeline Style Elements, that specifies table style elements of the timeline style that are specific to timelines. There MUST NOT be more than one **CT_TimelineStyleElements** in this element.

Attributes:

name: A **string** attribute, as specified in [XMLSCHEMA2/2] section 3.2.1, that specifies the name of the user-defined table style that this timeline style is based upon. The length of the **string** MUST be greater than or equal to 1 character and less than or equal to 255 characters. This **string** MUST be unique within the **CT_TimelineStyle** elements in the **Styles** part, as specified in [ISO/IEC29500-1:2016] section 12.3.20. This **string** MUST match the **name** attribute of a **CT_TableStyle** element, as specified in [ISO/IEC29500-4:2016] section A.2, in the **Styles** part. In the **CT_TableStyle** element with a **name** attribute that matches this **string**, the **pivot** attribute MUST equal "false" and the **table** attribute MUST equal "false".

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
   <xsd:complexType name="CT_TimelineStyle">
     <xsd:sequence>
       <xsd:element name="timelineStyleElements" type="CT_TimelineStyleElements" minOccurs="0"
   maxOccurs="1"/>
     </xsd:sequence>
     <xsd:attribute name="name" type="xsd:string" use="required"/>
   </xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.108   CT_TimelineStyleElement

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineStyleElements

A complex type that specifies a table style element, as specified in [ISO/IEC29500-1:2016] section 18.8, of a timeline style, as specified in section Timeline Styles.

Attributes:

type: An [ST_TimelineStyleType](#) attribute that specifies the type of the table style element. This attribute MUST be unique within the parent **CT_TimelineStyleElements** complex type.

dxfId: An **ST_DxfId** attribute, as specified in [ISO/IEC29500-1:2016] section 18.18.25, that specifies a zero-based index for the list of elements specified by the **dxfs** global element, as specified in section [2.4.55](#). The specified **CT_Dxf** complex type, as specified in [ISO/IEC29500-4:2016] section A.2, specifies the formatting to use with this table style element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineStyleElement">
  <xsd:attribute name="type" type="ST_TimelineStyleType" use="required"/>
  <xsd:attribute name="dxfId" type="x:ST_DxfId" use="optional"/>
</xsd:complexType>
```

See section [5.3](#) for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.109   CT_TimelinePivotCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: [timelinePivotCacheDefinition](#)

A complex type that specifies the extended properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) **PivotCache** definition.

Attributes:

timelineData: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the [Timeline Cache Relationship to PivotCache](#). MUST be "true" if the **OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) **PivotCache** definition is being referenced by a [timeline cache](#).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelinePivotCacheDefinition">
  <xsd:attribute name="timelineData" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section [5.3](#) for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.110   CT_Timelines

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: [timelines](#)

A complex type that specifies a list of **CT_Timeline** elements, as specified in section [2.6.111](#). The list of **CT_Timeline** elements specifies all [Timeline views](#) on the **worksheet**.

Child Elements:

timeline: A **CT_Timeline** element that specifies a Timeline view on the worksheet.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT Timelines">
  <xsd:sequence>
    <xsd:element name="timeline" type="CT_Timeline" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.111   CT_Timeline

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_Timelines

The **CT_Timeline** complex type specifies a **Timeline view** (section 2.3.5.2) in this **worksheet**.

Child Elements:

extLst: A **CT_ExtensionList** element, as specified in [ISO/IEC29500-4:2016] section A.2, that specifies future extensibility for this element.

Attributes:

name: An **ST_Xstring** attribute, as specified in [ISO/IEC29500-1:2016] section 22.9.2.19, that specifies the name of the **Timeline view**. This element MUST be a unique case-insensitive name within the scope of this **workbook**. The length of this attribute MUST be greater than or equal to one character and MUST be less than or equal to 32767 characters.

xr10:uid: An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the **Timeline view**. If any instance of this type specifies this attribute, then all instances MUST specify it, and the values MUST be distinct.

cache: An **ST_Xstring** attribute that specifies the name of the **Timeline cache** (section 2.3.5.1) that this **Timeline view** is associated with. There MUST be a **CT_TimelineCacheDefinition** element (section 2.6.112) within this workbook with the **name** attribute equal to the value of this attribute.

caption: An **ST_Xstring** attribute that specifies the caption of the **Timeline view**. If this string exists, the length MUST be greater than or equal to one character.

showHeader: A **Boolean** attribute, as specified in [XMLSCHEMA2/2] section 3.2.2, that specifies whether the header is displayed.

Value	Meaning
"true"	The header is displayed.
"false"	The header is suppressed.

showSelectionLabel: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the selection label is displayed.

Value	Meaning
"true"	The selection label is displayed.
"false"	The selection label is suppressed.

showTimeLevel: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the time level is displayed.

Value	Meaning
"true"	The time level is displayed.
"false"	The time level is suppressed.

showHorizontalScrollbar: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the horizontal scrollbar is displayed.

Value	Meaning
"true"	The horizontal scrollbar is displayed.
"false"	The horizontal scrollbar is suppressed.

level: An **unsignedInt** attribute, as specified in [XMLSCHEMA2/2] section 3.3.22, that specifies the current time level of the **Timeline** (section 2.3.5). This element MUST be a value from the following table:

Value	Meaning
0	Year
1	Quarter
2	Month
3	Day

selectionLevel: An **unsignedInt** attribute that specifies the time level at which the current selection was made for the **Timeline**. This element MUST be a value from the following table:

Value	Meaning
0	Year
1	Quarter
2	Month
3	Day

scrollPosition: A **dateTime** attribute ([XMLSCHEMA2/2] section 3.2.7) that specifies the start date of the timespan scrolling position of the **Timeline**.

style: An **ST_Xstring** attribute ([ISO/IEC29500-1:2016] section 22.9.2.19) that specifies the **Timeline style** (section 2.3.5.4) of the **Timeline view**. If this **field** exists, this string MUST match

the **name** attribute of a **CT_TimelineStyle** element (section 2.6.107) within this workbook or MUST be equal to one of the built-in **Timeline style** names:

Built-in Timeline style names
TimelineStyleLight1
TimelineStyleLight2
TimelineStyleLight3
TimelineStyleLight4
TimelineStyleLight5
TimelineStyleLight6
TimelineStyleDark1
TimelineStyleDark2
TimelineStyleDark3
TimelineStyleDark4
TimelineStyleDark5
TimelineStyleDark6

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Timeline">
  <xsd:sequence>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
  <xsd:attribute ref="xr10:uid" use="optional"/>
  <xsd:attribute name="cache" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="caption" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="showHeader" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="showSelectionLabel" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="showTimeLevel" type="xsd:boolean" use="optional" default="true"/>
  <xsd:attribute name="showHorizontalScrollbar" type="xsd:boolean" use="optional"
default="true"/>
  <xsd:attribute name="level" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="selectionLevel" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="scrollPosition" type="xsd:dateTime" use="optional"/>
  <xsd:attribute name="style" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.112   CT_TimelineCacheDefinition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: timelineCacheDefinition

A complex type that specifies a Timeline cache.

Child Elements:

pivotTables: A **CT_TimelineCachePivotTables** element (section 2.6.113) that specifies a group of **CT_ TimelineCachePivotTable** elements (section 2.6.114) that specify the PivotTable ([ISO/IEC29500-1:2016] section 18.10) views and Non-Worksheet PivotTables that are filtered by the **Timeline cache** (section 2.1.7).

state: A **CT_TimelineState** element (section 2.6.116) that specifies the information used for display in the **Timeline view** (section 2.3.5.2).

timelinePivotFilter: A CT_TimelinePivotFilter element (section 2.6.118) that specifies the filter used by the Timeline Cache (section 2.1.7) to filter PivotTable ([ISO/IEC29500-1:2016] section 18.10) views and Non-Worksheet PivotTables. This element MUST exist only if the **filterType** attribute of the CT_TimelineState (section 2.6.116) element of the Timeline Cache has a value that is not one of the following:

Enumeration Value	Description
dateBetween (Date Between)	Indicates the "between" filter for date values.
dateEqual (Date Equals)	Indicates the "equals" filter for date values.
unknown	Indicates the absence of a filter for date values.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the **Timeline cache** (section 2.3.5.1). MUST adhere to the name production rule provided in section 2.2.2. MUST be a unique case-insensitive name within the scope of **defined names**.

xr10:uid: An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the **Timeline cache** (section 2.3.5.1). If any instance of this type specifies this attribute, then all instances MUST specify it, and the values MUST be distinct

sourceName: An **ST_Xstring** attribute that specifies the **MDX unique name** of the key **attribute** of the associated **OLAP hierarchy** if the **Timeline source data** (section 2.3.5.1.1) is an **OLAP data source**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT TimelineCacheDefinition">
  <xsd:sequence>
    <xsd:element name="pivotTables" type="CT_TimelineCachePivotTables" minOccurs="0"
maxOccurs="1"/>
    <xsd:element name="state" type="CT_TimelineState" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="timelinePivotFilter" minOccurs="0" maxOccurs="1"
type="CT_TimelinePivotFilter"/>
    <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="x:ST Xstring" use="required"/>
  <xsd:attribute ref="xr10:uid" use="optional"/>
  <xsd:attribute name="sourceName" type="x:ST Xstring" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.113 CT_TimelineCachePivotTables

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineCacheDefinition

A complex type that specifies a group of CT_TimelineCachePivotTable elements that specify the PivotTable ([ISO/IEC29500-1:2016] section 18.10) views and Charts ([ISO/IEC29500-1:2016] section 21.2) based on Non-Worksheet PivotTables that are filtered by the Timeline cache.

Child Elements:

pivotTable: A CT_TimelineCachePivotTable element that specifies the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view or a Non-Worksheet PivotTable that is filtered. The list of **pivotTable** child elements MUST NOT contain duplicates.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineCachePivotTables">
  <xsd:sequence>
    <xsd:element name="pivotTable" type="CT TimelineCachePivotTable" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.114 CT_TimelineCachePivotTable

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineCachePivotTables

A complex type that specifies a PivotTable ([ISO/IEC29500-1:2016] section 18.10) view filtered by a Timeline cache.

Attributes:

tabId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the **unique identifier (UID)** of the **worksheet** that contains the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view specified by the **name** attribute. MUST match the **sheetId** of an existing **sheet** ([ISO/IEC29500-4:2016] section A.2) element within the **workbook**. MUST be equal to the decimal equivalent of 0xFFFFFFFF if the PivotTable specified by the name attribute is a Non-Worksheet PivotTable.

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) view on the worksheet specified by **tabId**. MUST match the **name** attribute of an existing **pivotTableDefinition** element in the worksheet. The **createdVersion** attribute of the **CT_PivotTableDefinition** ([ISO/IEC29500-4:2016] section A.2) element that defines the specified PivotTable ([ISO/IEC29500-1:2016] section 18.10) MUST be greater than or equal to 3.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT TimelineCachePivotTable">
  <xsd:attribute name="tabId" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.115   CT_TimelineRange

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineState

A complex type that specifies the date **range** for a CT_TimelineState element that is the parent of this element.

Attributes:

startDate: A **dateTime** ([XMLSCHEMA2/2] section 3.2.7) attribute that specifies the start value of the date range.

endDate: A **dateTime** attribute that specifies the end value of the date range.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineRange">
  <xsd:attribute name="startDate" type="xsd:dateTime" use="required"/>
  <xsd:attribute name="endDate" type="xsd:dateTime" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.116   CT_TimelineState

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineCacheDefinition

The **CT_TimelineState** complex type specifies the **Timeline state** (section 2.3.5.1.4) of the **Timeline cache** (section 2.3.5.1).

Child Elements:

selection: A **CT_TimelineRange** element (section 2.6.115) that specifies the start and end dates that are selected in the **Timeline view** (section 2.3.5.2). The start and end dates in the selection element MUST be interpreted as **dateTime** values ([XMLSCHEMA2/2] section 3.2.7).

bounds: A **CT_TimelineRange** element that specifies the minimum and maximum dates available for display in the **Timeline view**. The minimum and maximum dates in the bounds element MUST be interpreted as **dateTime** values ([XMLSCHEMA2/2] section 3.2.7).

extLst: A **CT_ExtensionList** element ([ISO/IEC29500-4:2016] section A.2) that specifies future extensibility for this element.

Attributes:

singleRangeFilterState: A **Boolean** attribute ([XMLSCHEMA2/2] section 3.2.2) that specifies whether the filtering state of the **Timeline** (section 2.3.5) is a contiguous date range.

Value	Meaning
"true"	The filtering state of the Timeline is a contiguous date range.
"false"	The filtering state of the Timeline is not a contiguous date range.

minimalRefreshVersion: An **unsignedInt** attribute ([XMLSCHEMA2/2] section 3.3.22) that specifies the minimum application version required to refresh the **Timeline cache.**

lastRefreshVersion: An **unsignedInt** attribute that specifies the application version that last refreshed the **Timeline cache.**

pivotCacheId: An **unsignedInt** attribute that specifies the associated **OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache. This element MUST be equal to the **pivotCacheId** attribute of an existing **CT_PivotCacheDefinition** element (section 2.6.33).

filterType: An **ST_PivotFilterType** attribute ([ISO/IEC29500-1:2016] section 18.18.59) that specifies type of the **filter** ([ISO/IEC29500-1:2016] section 18.10.1.33) used in the **Timeline.**

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelineState">
  <xsd:sequence>
    <xsd:element name="selection" type="CT_TimelineRange" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="bounds" type="CT_TimelineRange" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="singleRangeFilterState" type="xsd:boolean" use="optional"
default="true"/>
  <xsd:attribute name="minimalRefreshVersion" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="lastRefreshVersion" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="filterType" use="required" type="x:ST_PivotFilterType"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.117 CT_WorkbookPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: workbookPr

CT_WorkbookPr is a complex type that specifies additional properties for a **workbook**.

Attributes:

chartTrackingRefBase: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies how **data point** properties and datalabels in all charts ([ISO/IEC29500-1:2016] section 21.2) in this workbook behave.

Value	Meaning
True	Datapoint properties and datalabels ([MS-ODRAWXML] section 2.2.1.2) in all charts ([ISO/IEC29500-1:2016] section 21.2) in this workbook follow their reference.
False	Datapoint properties and datalabels ([MS-ODRAWXML] section 2.2.1.2) in all charts ([ISO/IEC29500-1:2016] section 21.2) in this workbook follow their position in the chart.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_WorkbookPr">
  <xsd:attribute name="chartTrackingRefBase" type="xsd:boolean" default="false"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.118   CT_TimelinePivotFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineCacheDefinition

A complex type that specifies the filter used by the Timeline Cache (section 2.1.7) to filter PivotTable ([ISO/IEC29500-1:2016] section 18.10) views and Non-Worksheet PivotTables.

Child Elements:

autoFilter: A **CT_AutoFilter** ([ISO/IEC29500-1:2016] section 18.3.1.2) element that specifies the embedded auto filter of the filter**.**

Attributes:

useWholeDay: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **pivot filter** ([ISO/IEC29500-1:2016] section 18.10.1.33) associated with either the PivotTable ([ISO/IEC29500-1:2016] section 18.10) or Non-Worksheet PivotTable (section 2.3.3) filtered by the Timeline Cache (section 2.1.7) uses whole days in its filtering criteria.

Value	Meaning
"true"	The pivot filter ([ISO/IEC29500-1:2016] section 18.10.1.33) associated with either the PivotTable ([ISO/IEC29500-1:2016] section 18.10) or Non-Worksheet PivotTable (section 2.3.3) filtered by the Timeline Cache (section 2.1.7) uses whole days in its filtering criteria.
"false"	The pivot filter ([ISO/IEC29500-1:2016] section 18.10.1.33) associated with either the PivotTable ([ISO/IEC29500-1:2016] section 18.10) or Non-Worksheet PivotTable (section 2.3.3) filtered by the Timeline Cache (section 2.1.7) does not use whole days in its filtering criteria.

fld: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the index of the **field** to which the **pivot filter** associated with this filter belongs to.

id: An **unsignedInt** attribute that specifies the unique identifier of the **pivot filter** associated with this filter as assigned by the PivotTable ([ISO/IEC29500-1:2016] section 18.10) or Non-Worksheet PivotTable (section 2.3.3) filtered by the Timeline Cache (section 2.1.7).

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the filter. This string MUST be less than or equal to 65,535 characters in length.

description: An **ST_Xstring** attribute that specifies the description of the filter. This string MUST be less than or equal to 65,535 characters in length**.**

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_TimelinePivotFilter">
  <xsd:sequence>
    <xsd:element name="autoFilter" minOccurs="0" maxOccurs="1" type="x:CT_AutoFilter"/>
  </xsd:sequence>
  <xsd:attribute name="useWholeDay" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="fld" use="required" type="xsd:unsignedInt"/>
  <xsd:attribute name="id" use="required" type="xsd:unsignedInt"/>
  <xsd:attribute name="name" use="optional" type="x:ST_Xstring"/>
  <xsd:attribute name="description" use="optional" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.119 CT_ModelTextPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_Connection

Specifies Model Data Source text importation ([MS-XLSB] section 2.2.8.9.4) properties in addition to those specified in **CT_TextPr** ([ISO/IEC29500-1:2016] section A.2) element.

Attributes:

headers: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether data imported by this connection has **column** headers.

Value	Meaning
"true"	Data imported by this connection has column headers.
"false"	Data imported by this connection does not have column headers.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ModelTextPr">
  <xsd:attribute name="headers" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.120 CT_RangePr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_Connection

The **CT_RangePr** complex type specifies properties of a Model Data Source Worksheet Data connection ([MS-XLSB] section 2.2.8.9.3).

Attributes:

sourceName: An attribute of type **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) that specifies the string identifier of the source cell range for this connection. The string length MUST be less than or equal to 65,535 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RangePr">
  <xsd:attribute name="sourceName" use="required" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.121   CT_DbTable

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_DbTables

The **CT_DbTable** complex type specifies a single database table that is used by a Model Data Source **OLE DB** connection ([MS-XLSB] section 2.2.8.9.1) or Model Data Source Data Feed connection ([MS-XLSB] section 2.2.8.9.2).

Attributes:

name: An attribute of type **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) that specifies the database table name.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DbTable">
  <xsd:attribute name="name" use="required" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.122   CT_DbTables

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_OledbPr, CT_DataFeedPr

The **CT_DbTables** complex type specifies the list of database tables that are used by a Model Data Source OLE DB connection ([MS-XLSB] section 2.2.8.9.1) or Model Data Source Data Feed connection ([MS-XLSB] section 2.2.8.9.2).

Child Elements:

dbTable: An element of type **CT_DbTable** (section 2.6.121) specifying a single database table that is used by this connection.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DbTables">
  <xsd:sequence>
    <xsd:element name="dbTable" minOccurs="1" maxOccurs="unbounded" type="CT DbTable"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.123   CT_DbCommand

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_OledbPr

The **CT_DbCommand** complex type specifies **OLE DB** command text that is used by a Model Data Source OLE DB connection ([MS-XLSB] section 2.2.8.9.1).

Attributes:

text: An attribute of type **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) that specifies OLE DB command text.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DbCommand">
  <xsd:attribute name="text" use="required" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.124   CT_OledbPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_Connection

The **CT_OledbPr** complex type specifies properties of a Model Data Source OLE DB connection ([MS-XLSB] section 2.2.8.9.1).

Child Elements:

dbTables: An element of type **CT_DbTables** (section 2.6.122) specifying the list of database tables that are used by this connection.

dbCommand: An element of type **CT_DbCommand** (section 2.6.123) specifying **OLE DB** command text that is used by this connection.

Attributes:

connection: An attribute of type **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) that specifies the OLE DB connection string.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT OledbPr">
  <xsd:choice minOccurs="1" maxOccurs="1">
    <xsd:element name="dbTables" type="CT_DbTables"/>
    <xsd:element name="dbCommand" type="CT_DbCommand"/>
  </xsd:choice>
  <xsd:attribute name="connection" use="optional" type="x:ST Xstring"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.125   CT_DataFeedPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_Connection

Specifies properties of a Model Data Source Data Feed connection ([MS-XLSB] section 2.2.8.9.2).

Child Elements:

dbTables: A CT_DbTables element that specifies the list of database tables used by this connection.

Attributes:

connection: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies connection string.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataFeedPr">
  <xsd:sequence>
    <xsd:element name="dbTables" type="CT_DbTables" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="connection" use="required" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.126   CT_CachedUniqueNames

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: cachedUniqueNames

A complex type that specifies the **MDX unique names** for PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache items in this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) cache **field**. MUST NOT exist if the **model** attribute of **CT_Connection** element of connection ([ISO/IEC29500-1:2016] section 2.6.91) associated with this PivotTable ([ISO/IEC29500-1:2016] section 18.10) pivot cache is not equal to "true".

Child Elements:

cachedUniqueName: A CT_CachedUniqueName element that specifies the MDX unique name for a PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT CachedUniqueNames">
  <xsd:sequence>
    <xsd:element name="cachedUniqueName" minOccurs="1" maxOccurs="unbounded"
type="CT_CachedUniqueName"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.127   CT_CachedUniqueName

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_CachedUniqueNames

A complex type that specifies the **MDX unique name** for a PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item.

Attributes:

index: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies an index of the PivotTable ([ISO/IEC29500-1:2016] section 18.10) cache item in this **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) cache **field**. MUST be less than **count** attributes of the **CT_Items** ([ISO/IEC29500-4:2016] section A.2) element specified by the ancestor **CT_CacheField** ([ISO/IEC29500-4:2016] section A.2) element. MUST be unique within parent CT_CachedUniqueNames (section 2.6.126) collection.

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the MDX unique name. MUST be less than or equal to 65,535 characters in length.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT CachedUniqueName">
  <xsd:attribute name="index" use="required" type="xsd:unsignedInt"/>
  <xsd:attribute name="name" use="required" type="x:ST_Xstring"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.128   CT_ModelTable

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_ModelTables

Specifies properties of a single table in **spreadsheet data model**.

Attributes:

id: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies unique id of the spreadsheet data model table.

name: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies name of the spreadsheet data model table.

connection: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies name of the workbook connection associated with this spreadsheet data model table.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ModelTable">
  <xsd:attribute name="id" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="name" type="x:ST Xstring" use="required"/>
  <xsd:attribute name="connection" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.129   CT_ModelTables

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_DataModel

Specifies tables in the **spreadsheet data model**.

Child Elements:

modelTable: A CT_ModelTable element that specifies properties of a single table in spreadsheet data model.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ModelTables">
  <xsd:sequence>
    <xsd:element name="modelTable" minOccurs="1" maxOccurs="unbounded" type="CT_ModelTable"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.130   CT_ModelRelationship

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_ModelRelationships

Specifies a single relationship in the **spreadsheet data model**.

Attributes:

fromTable: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the foreign key table for this relationship**.**

fromColumn: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the foreign key table **column** for this relationship.

toTable: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the primary key table for this relationship.

toColumn: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the primary key table column for this relationship.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ModelRelationship">
  <xsd:attribute name="fromTable" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="fromColumn" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="toTable" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="toColumn" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.131   CT_ModelRelationships

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_DataModel

Specifies active relationships in the **spreadsheet data model**.

Child Elements:

modelRelationship: A CT_ModelRelationship element that specifies a single relationship in the spreadsheet data model.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ModelRelationships">
  <xsd:sequence>
    <xsd:element name="modelRelationship" minOccurs="1" maxOccurs="unbounded"
type="CT_ModelRelationship"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.132   CT_DataModel

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: dataModel

Specifies properties of a **spreadsheet data model**.

Child Elements:

modelTables: A **CT_ModelTables** (section 2.6.129) element that specifies tables in the spreadsheet data model.

modelRelationships: A **CT_ModelRelationships** (section 2.6.131) element that specifies active relationships in the spreadsheet data model.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

minVersionLoad: An **unsignedByte** attribute that specifies the minimum application version required to load the spreadsheet data model in this workbook. This MUST be greater than or equal to 5.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataModel">
  <xsd:sequence>
    <xsd:element name="modelTables" minOccurs="0" maxOccurs="1" type="CT_ModelTables"/>
    <xsd:element name="modelRelationships" minOccurs="0" maxOccurs="1"
type="CT_ModelRelationships"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="minVersionLoad" type="xsd:unsignedByte" use="optional" default="5"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.133   CT_PivotTableData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: pivotTableData

The **CT_PivotTableData** complex type specifies the **PivotValues** (section 2.3.4) of the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) that is specified by the **pivotTableReference** (section 2.4.1) element in the extension of a **workbook** (section 2.2.4.11).

Child Elements:

pivotRow: A **CT_PivotRow** (section 2.6.134) element that specifies a single **row** of **PivotValueCells** (section 2.3.4.1) in an element of this type in the **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) that is specified by the **pivotTableReference** (section 2.4.1) element in the extension of a workbook (section 2.2.4.11).

Attributes:

rowCount: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of **pivotRow** child elements in an element of this type. This value MUST be equal to the value of the **count** attribute of the **rowItems** element, as specified in [ISO/IEC29500-1:2016] section 18.10.1.84.

columnCount: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute specifying the number of **PivotValueCells** (section 2.3.4.1) that are specified by the **CT_PivotValueCell** (section 2.6.135) complex type in each of the **pivotRow** child elements of this type. This value MUST be equal to the value of the **count** attribute in the **pivotRow** element, as specified by the **CT_PivotRow** (section 2.6.134) complex type. This value MUST be equal to the value of the **count** attribute of the **colItems**, ([ISO/IEC29500-1:2016] section 18.10.1.17) element.

cacheId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the associated **OLAP** PivotTable ([ISO/IEC29500-1:2016] section 18.10) PivotCache.

The OLAP PivotTable PivotCache that is specified by this attribute MUST be extended by an **ext** ([ISO/IEC29500-1:2016] section 18.2.7) element that has a structure specified by a **CT_PivotCacheDefinition** (section 2.6.33) element. The **pivotCacheId** attribute of such a **CT_PivotCacheDefinition** element MUST be equal to this attribute.

The OLAP PivotTable PivotCache that is specified by this attribute MUST also be extended by an **ext** element that has structure specified by a **CT_PivotCacheIdVersion** (section 2.6.138) element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotTableData">
  <xsd:sequence>
    <xsd:element name="pivotRow" type="CT PivotRow" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="rowCount" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="columnCount" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="cacheId" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.134   CT_PivotRow

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_PivotTableData

A complex type that specifies a single **row** of PivotValueCells in the pivotTableData element of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) specified by the pivotTableReference element in the extension of a **workbook** as specified by section 2.2.4.11.

Child Elements:

c: A CT_PivotValueCell element that specifies a PivotValueCell.

Attributes:

r: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the row index of this element. MUST be within the range of items as specified by the **rowCount** attribute of the complex type CT_PivotTableData.

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of child elements of type CT_PivotValueCell in the current **pivotRow** element. MUST be less than or equal to the value specified by the **columnCount** attribute of complex type CT_PivotTableData.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT PivotRow">
  <xsd:sequence>
    <xsd:element name="c" type="CT_PivotValueCell" minOccurs="1" maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="r" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.135   CT_PivotValueCell

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_PivotRow

A complex type that specifies a PivotValueCell.

Child Elements:

v: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) element that specifies the string representation of the Value of a PivotValueCell. The attribute **t** of the parent **CT_PivotValueCell** element specifies how application interprets this element.

x: A CT_PivotValueCellExtra element that specifies the server formatting on the current **CT_PivotValueCell** element.

Attributes:

i: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the **column** index of the current **CT_PivotValueCell** element. MUST be within the range of items as specified by the **columnCount** attribute of complex type CT_PivotTableData.

t: An ST_SXVCellType attribute that specifies the type of the PivotValueCell represented by the parent element of this attribute.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotValueCell">
  <xsd:sequence>
    <xsd:element name="v" type="x:ST Xstring" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="x" type="CT_PivotValueCellExtra" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="i" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="t" type="ST SXVCellType" use="optional" default="n"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.136   CT_PivotValueCellExtra

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_PivotValueCell

A complex type that specifies the **server formatting** (section 2.3.4.1.2) for a **CT_PivotValueCell** element (section 2.6.135) that is the parent of this element.

Attributes:

in: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies an index to the list of the numeric formats, specified by the **pivotTableServerFormats** element (section 2.4.2) specified in the extension of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) specified by the **pivotTableReference** element (section 2.4.1) in the extension of a **workbook** as specified in section 2.2.4.11. The value MUST be between zero and the **count** attribute of the **CT_PivotTableServerFormats** element (section 2.6.137).

bc: An **ST_UnsignedIntHex** ([ISO/IEC29500-1:2016] section 18.18.86) attribute that specifies the background color for the **CT_PivotValueCell** element (section 2.6.135) that is a parent of this element. The color is specified as a hexadecimal value in RGB space.

fc: An **ST_UnsignedIntHex** ([ISO/IEC29500-1:2016] section 18.18.86) attribute that specifies the foreground color for the **CT_PivotValueCell** element that is a parent of this element. The color is specified as a hexadecimal value in RGB space.

i: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **PivotValueCell** (section 2.3.4.1) specified by **CT_PivotValueCell**, that is a parent of this element, contains italic formatting**.** A value of one or true indicates this value contains italic formatting on the server.

un: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **PivotValueCell** specified by **CT_PivotValueCell** that is a parent of this element contains underline formatting. A value of 1 or true indicates this value contains underline formatting on the server.

st: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **PivotValueCell** specified by **CT_PivotValueCell** that is a parent of this element contains strikethrough formatting. A value of 1 or true indicates this value contains strikethrough formatting on the server.

b: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the **PivotValueCell** specified by **CT_PivotValueCell** that is a parent of this element contains bold formatting. A value of 1 or true indicates this value contains bold formatting on the server.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotValueCellExtra">
  <xsd:attribute name="in" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="bc" type="x:ST_UnsignedIntHex" use="optional"/>
  <xsd:attribute name="fc" type="x:ST_UnsignedIntHex" use="optional"/>
  <xsd:attribute name="i" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="un" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="st" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="b" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.137   CT_PivotTableServerFormats

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

A complex type that specifies a list of **CT_ServerFormat** ([ISO/IEC29500-1:2016] section 18.10.1.86) elements in a PivotTable ([ISO/IEC29500-1:2016] section 18.10) that is specified by a pivotTableReference element in the extension of a **workbook**. MUST contain fewer than 2^{31} elements.

Child Elements:

serverFormat: A **CT_ServerFormat** ([ISO/IEC29500-1:2016] section 18.10.1.86) element that specifies the numeric format for one or more PivotValueCells.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of **serverFormat** child elements in the collection.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotTableServerFormats">
  <xsd:sequence>
    <xsd:element name="serverFormat" type="x:CT_ServerFormat" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="count" use="required" type="xsd:unsignedInt"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.138 CT_PivotCacheIdVersion

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: pivotCacheIdVersion

A complex type that specifies the extended properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) **PivotCache** definition.

Attributes:

cacheIdSupportedVersion: An **unsignedByte** ([XMLSCHEMA2/2] section 3.3.24) attribute that specifies minimum version of the application where this **pivotCacheId** attribute of an existing **CT_PivotCacheDefinition** element is guaranteed to be unique.

cacheIdCreatedVersion: An **unsignedByte** ([XMLSCHEMA2/2] section 3.3.24) attribute that specifies the minimum version of the application where this **pivotCacheId** attribute of an existing **CT_PivotCacheDefinition** element can be changed upon saving the **workbook**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotCacheIdVersion">
  <xsd:attribute name="cacheIdSupportedVersion" type="xsd:unsignedByte" use="required"/>
  <xsd:attribute name="cacheIdCreatedVersion" type="xsd:unsignedByte" use="required"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.139 CT_Timeline

Target namespace: http://schemas.microsoft.com/office/drawing/2012/timeslicer

Referenced by: timeslicer

This complex type specifies which timeline view is associated with this drawing element.

Child Elements:

extLst: A **CT_OfficeArtExtensionList** ([ISO/IEC29500-4:2016] section A.4.1) element that specifies future extensibility for this element.

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the timeline view (section 2.3.5.2) that is associated with this drawing element. The value of this attribute MUST match the value of the **name** attribute of a **timeline** element within the CT_Timelines element (section 2.6.110) for the current **worksheet**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT Timeline">
  <xsd:sequence>
    <xsd:element name="extLst" type="a:CT OfficeArtExtensionList" minOccurs="0"
maxOccurs="1"/>
  </xsd:sequence>
```

```
      <xsd:attribute name="name" type="xsd:string" use="required"/>
   </xsd:complexType>
```

See section 5.7 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.140   CT_AbsolutePath

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/ac

Referenced by: absPath

CT_AbsolutePath is a complex type that specifies the absolute path to a workbook.

Attributes:

url: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the URL string of the absolute path to the workbook**.**

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
   <xsd:complexType name="CT_AbsolutePath">
     <xsd:attribute name="url" use="required" type="x:ST_Xstring"/>
   </xsd:complexType>
```

See section 5.9 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.141   CT_DataField

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: dataField

This complex type specifies extended information about a **PivotTable** ([ISO/IEC29500-1:2016] section 18.10) data **field** item ([ISO/IEC29500-1:2016] section 18.10.1.22).

Attributes:

isCountDistinct: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies that the aggregation function which applies to this data field item ([ISO/IEC29500-1:2016] section 18.10.1.22) is the count of unique values. If this value is true, the subtotal attribute is ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
   <xsd:complexType name="CT_DataField">
     <xsd:attribute name="isCountDistinct" type="xsd:boolean" use="optional" default="false"/>
   </xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.142   CT_Survey

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: survey

CT_Survey is a complex type that specifies the properties for a survey.

Child Elements:

surveyPr: A CT_SurveyElementPr element that specifies additional properties of the survey.

titlePr: A CT_SurveyElementPr element that specifies additional properties associated with the title of the survey.

descriptionPr: A CT_SurveyElementPr element that specifies additional properties associated with the description of the survey.

questions: A CT_SurveyQuestions element that specifies the set of survey question elements associated with this survey.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

id: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the **unique identifier (UID)** of the survey. This id MUST be unique within the **workbook**.

guid: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that identifies this survey.

title: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the title of the survey.

description: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the description of the survey.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Survey">
  <xsd:sequence>
    <xsd:element name="surveyPr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="titlePr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="descriptionPr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="questions" type="CT_SurveyQuestions" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="guid" type="x:ST_Guid" use="required"/>
  <xsd:attribute name="title" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="description" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.143   CT_SurveyQuestions

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_Survey

CT_SurveyQuestions is a complex type that specifies a list of survey question elements present in a survey.

Child Elements:

questionsPr: A CT_SurveyElementPr element that specifies additional properties associated with the list of survey question elements.

question: A CT_SurveyQuestion element that specifies one survey question in the list.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SurveyQuestions">
  <xsd:sequence>
    <xsd:element name="questionsPr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="question" type="CT_SurveyQuestion" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.144 CT_SurveyQuestion

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_SurveyQuestions

CT_SurveyQuestion is a complex type that specifies the properties of a survey question.

Child Elements:

questionPr: A CT_SurveyElementPr element that specifies additional properties associated with the survey question.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

binding: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the **unique identifier (UID)** of the Table Column ([ISO/IEC29500-1:2016] section 18.5.1.3) to which the survey question is bound. MUST match the **id** of an existing Table Column ([ISO/IEC29500-1:2016] section 18.5.1.3) element within the Table ([ISO/IEC29500-1:2016] section 18.5) with which the survey is associated.

text: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the main text of the survey question.

type: An ST_QuestionType attribute that specifies the type of the survey question.

format: An ST_QuestionFormat attribute that specifies the format of answers to the survey question.

helpText: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies additional descriptive text associated with the survey question.

required: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether an answer for the survey question is required when filling in the corresponding survey.

Value	Meaning
"false"	The answer to the survey question is not required when filling in the survey.
"true"	The answer to the survey question is required when filling in the survey.

defaultValue: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the default answer for the survey question.

decimalPlaces: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of digits after the decimal to use in a numerical answer to a survey question. MUST be less than or equal to 15.

rowSource: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the set of available answers for the survey question. The set of available answers is a semicolon delimited list of values. The string MUST conform to the following **Augmented Backus-Naur Form (ABNF)** ([RFC5234]) grammar:

```
rowsource = [value] / *terminated-value value
terminated-value = value ";"
value = *value-char-with-quote / quoted-value
quoted-value = %x22 value-char-with-semicolon %x22
value-char-with-semicolon = value-char / ";"
value-char-with-quote = value-char / %x22
;value-char = as defined by the production Char in the [W3C-XML] section 2.2, but MUST NOT be
";" or %x22
```

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SurveyQuestion">
  <xsd:sequence>
    <xsd:element name="questionPr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="binding" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="text" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="type" type="ST_QuestionType" use="optional"/>
  <xsd:attribute name="format" type="ST_QuestionFormat" use="optional"/>
  <xsd:attribute name="helpText" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="required" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="defaultValue" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="decimalPlaces" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="rowSource" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.145   CT_SurveyElementPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_Survey, CT_SurveyQuestions, CT_SurveyQuestion

CT_SurveyElementPr is a complex type that specifies additional properties of a survey element.

Child Elements:

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

cssClass: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies a Cascading Style Sheet (CSS, [CSS-Level2-2009]) class name to apply to the survey element.

bottom: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies the bottom boundary of this survey element in pixels.

top: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies the top boundary of the survey element in pixels.

left: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies the left boundary of the survey element in pixels.

right: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies the right boundary of the survey element in pixels.

width: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the width of the survey element in pixels.

height: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the height of the survey element in pixels.

position: An ST_SurveyPosition attribute that specifies the type of positioning to be used on the survey element**.**

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SurveyElementPr">
  <xsd:sequence>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="cssClass" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="bottom" type="xsd:int" use="optional"/>
  <xsd:attribute name="top" type="xsd:int" use="optional"/>
  <xsd:attribute name="left" type="xsd:int" use="optional"/>
  <xsd:attribute name="right" type="xsd:int" use="optional"/>
  <xsd:attribute name="width" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="height" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="position" type="ST_SurveyPosition" use="optional"/>
</xsd:complexType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.146   CT_Ref

Target namespace: http://schemas.microsoft.com/office/excel/2006/main

Referenced by: ref

CT_Ref is a complex type that extends **ST_Ref** ([ISO/IEC29500-1:2016] section 18.18.62) specifies a rectangular **range**.

Attributes:

edited: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies that at least one cell in this range has been edited by an application version that is unable to read one or more ancestor records.

adjusted: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this range has been adjusted by an application version that is unable to read one or more ancestor records.

adjust: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether application versions that are unable to read one or more ancestor records will adjust this range if the contents of the **cells** that this range refers to are changed. MUST be TRUE if **adjusted** is TRUE.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Ref">
  <xsd:simpleContent>
    <xsd:extension base="ST_Ref">
      <xsd:attribute name="edited" type="xsd:boolean" use="optional"/>
      <xsd:attribute name="adjusted" type="xsd:boolean" use="optional"/>
      <xsd:attribute name="adjust" type="xsd:boolean" use="optional"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

See section 5.1 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.147 CT_Sqref

Target namespace: http://schemas.microsoft.com/office/excel/2006/main

Referenced by: sqref, CT_ConditionalFormatting, CT_DataValidation, CT_Sparkline, CT_IgnoredError, CT_ProtectedRange

CT_Sqref is a complex type that extends **ST_Sqref** ([ISO/IEC29500-1:2016] section 18.18.76) specifies a sequence of cell references.

Attributes:

edited: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies that at least one cell in this **range** has been edited by an application version that is unable to read one or more ancestor records.

split: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies that this range has been split.

adjusted: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this range has been adjusted by an application version that is unable to read one or more ancestor records.

adjust: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether application versions that are unable to read one or more ancestor records will adjust this range if the contents of the **cells** that this range refers to are changed. MUST be TRUE if **adjusted** is TRUE.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Sqref">
  <xsd:simpleContent>
    <xsd:extension base="ST_Sqref">
      <xsd:attribute name="edited" type="xsd:boolean" use="optional"/>
      <xsd:attribute name="split" type="xsd:boolean" use="optional"/>
      <xsd:attribute name="adjusted" type="xsd:boolean" use="optional"/>
      <xsd:attribute name="adjust" type="xsd:boolean" use="optional"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

See section 5.1 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.148 CT_ApplicationNonVisualDrawingProps

Target namespace: http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing

Referenced by: CT_ContentPart

Non-visual ContentPart properties.

Attributes:

macro: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that contains an XL macro string.

fPublished: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that serves as a Flag to determine whether the shape will be published on XL server.

Value	Meaning
"true"	The shape will be published on XL server.
"false"	The shape will not be published on XL server.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ApplicationNonVisualDrawingProps">
  <xsd:attribute name="macro" type="xsd:string" use="optional"/>
  <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.8 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.149 CT_CacheSourceExt

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Extended description of the data source whose data is stored in the pivot cache.

Child Elements:

sourceConnection: A CT_SourceConnection element that specifies the source connection of the pivot cache.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CacheSourceExt">
  <xsd:sequence>
    <xsd:element ref="sourceConnection" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.150 CT_ContentPart

Target namespace: http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing

Referenced by: contentPart

 Specifies a reference to XML content in a format not specified in [ISO/IEC29500-1:2016].

Child Elements:

nvContentPartPr: A CT_ContentPartNonVisual element that specifies the non-visual properties of the content part.

nvPr: A CT_ApplicationNonVisualDrawingProps element that specifies non-visual drawing-specific properties.

xfrm: A CT_Transform2D ([ISO/IEC29500-1:2016] section A.4.1) element that specifies the 2-D transform for the content part.

extLst: A CT_OfficeArtExtensionList ([ISO/IEC29500-1:2016] section A.4.1) element that specifies future extensibility for this element.

Attributes:

r:id: An ST_RelationshipId ([ISO/IEC29500-1:2016] section 22.8.2.1) attribute that specifies the relationship identifier to a content part.

bwMode: An ST_BlackWhiteMode ([ISO/IEC29500-1:2016] section 20.1.10.10) attribute that specifies how to interpret color information contained within a content part to achieve a color, black and white, or grayscale rendering of the content part.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ContentPart">
  <xsd:sequence>
    <xsd:element name="nvContentPartPr" type="CT_ContentPartNonVisual" minOccurs="0"
maxOccurs="1"/>
    <xsd:element name="nvPr" type="CT ApplicationNonVisualDrawingProps" minOccurs="0"
maxOccurs="1"/>
    <xsd:element name="xfrm" type="a:CT_Transform2D" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" type="a:CT OfficeArtExtensionList" minOccurs="0"
maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute ref="r:id" use="required"/>
  <xsd:attribute name="bwMode" type="a:ST_BlackWhiteMode" use="optional" default="auto"/>
</xsd:complexType>
```

See section 5.8 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.151   CT_ContentPartNonVisual

Target namespace: http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing

Referenced by: CT_ContentPart

Non-visual ContentPart properties.

Child Elements:

cNvPr: A CT_NonVisualDrawingProps ([ISO/IEC29500-1:2016] section A.4.1) element that specifies non-visual drawing properties of the content part. This enables additional information that does not affect the appearance of the content part to be stored.

cNvContentPartPr: A CT_NonVisualInkContentPartProperties ([MS-ODRAWXML] section 2.3.3.7) element that specifies non-visual ink properties of the content part. This enables additional information that does not affect the appearance of ink in the content part to be stored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ContentPartNonVisual">
  <xsd:sequence>
    <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
    <xsd:element name="cNvContentPartPr" type="a14:CT_NonVisualInkContentPartProperties"
minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.8 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.152   CT_CalculatedTimeColumn

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/11/main

Referenced by: CT_ModelTimeGrouping

Specifies information about a single calculated time column**.**

Attributes:

columnName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the model column name for a specific time grouping granularity.

columnId: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the model column immutable identifier for a specific time grouping.

contentType: An ST_ModelTimeGroupingContentType attribute that specifies the type of content stored in this **calculated column**.

isSelected: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether this grouping granularity was applied in the last time grouping selection.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CalculatedTimeColumn">
  <xsd:attribute name="columnName" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="columnId" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="contentType" type="ST_ModelTimeGroupingContentType" use="required"/>
  <xsd:attribute name="isSelected" type="xsd:boolean" use="required"/>
</xsd:complexType>
```

See section 5.10 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.153   CT_ModelTimeGrouping

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/11/main

Referenced by: CT_ModelTimeGroupings

Specifies information about a single data model time grouping.

Child Elements:

calculatedTimeColumn: A **CT_CalculatedTimeColumn** (section 2.6.152) element that specifies information about a data model time grouping **calculated column**.

Attributes:

tableName: An ST_Xstring ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the model table name for this time grouping.

columnName: An ST_Xstring ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the model column name for this time grouping.

columnId: An ST_Xstring ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the model column immutable identifier for this time grouping.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ModelTimeGrouping">
  <xsd:sequence>
    <xsd:element name="calculatedTimeColumn" minOccurs="1" maxOccurs="unbounded"
type="CT CalculatedTimeColumn"/>
  </xsd:sequence>
  <xsd:attribute name="tableName" type="x:ST Xstring" use="required"/>
  <xsd:attribute name="columnName" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="columnId" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.10 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.154   CT_ModelTimeGroupings

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/11/main

Referenced by: modelTimeGroupings

Specifies information about data model time groupings.

Child Elements:

modelTimeGrouping: A **CT_ModelTimeGrouping** (section 2.6.153) element that specifies information about data model single time grouping.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ModelTimeGroupings">
  <xsd:sequence>
    <xsd:element name="modelTimeGrouping" minOccurs="1" maxOccurs="unbounded"
type="CT_ModelTimeGrouping"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.10 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.155   CT_RevisionPtr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/revision

Referenced by: revisionPtr

This element specifies metadata supporting runtime scenarios for Microsoft Excel.

Attributes:

revIDLastSave: An ST_Xrevid attribute that SHOULD be ignored.

documentId: An ST_Xstring ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that SHOULD be ignored.

xr6:coauthVersionLast: An unsignedInt ([XMLSCHEMA2/2] section 3.3.22) attribute that SHOULD be ignored.

xr6:coauthVersionMax: An unsignedInt ([XMLSCHEMA2/2] section 3.3.22) attribute that SHOULD be ignored.

xr10:uidLastSave: An ST_Guid ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that SHOULD be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RevisionPtr">
  <xsd:attribute name="revIDLastSave" type="ST Xrevid" use="required"/>
  <xsd:attribute name="documentId" type="x:ST Xstring" use="required"/>
  <xsd:attribute ref="xr6:coauthVersionLast" use="optional" default="0"/>
  <xsd:attribute ref="xr6:coauthVersionMax" use="optional" default="0"/>
  <xsd:attribute ref="xr10:uidLastSave" use="optional"/>
</xsd:complexType>
```

See section 5.15 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.156 CT_PivotTableDefinition16

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2016/pivotdefaultlayout

Referenced by: pivotTableDefinition16

This element specifies additional properties of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) view.

Attributes:

EnabledSubtotalsDefault: A boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether subtotals are enabled by default for the PivotTable.

SubtotalsOnTopDefault: A boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether enabled subtotals are on the top of the PivotTable by default.

InsertBlankRowDefault: A boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether blank rows are inserted into the PivotTable by default.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_PivotTableDefinition16">
  <xsd:attribute name="EnabledSubtotalsDefault" type="xsd:boolean" use="optional"
default="true"/>
```

```
      <xsd:attribute name="SubtotalsOnTopDefault" type="xsd:boolean" use="optional"
default="true"/>
      <xsd:attribute name="InsertBlankRowDefault" type="xsd:boolean" use="optional"
default="false"/>
   </xsd:complexType>
```

See section 5.19 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.157   CT_Array

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_ArrayData

This element specifies the properties of a single **rich array**.

Child Elements:

v: A CT_ArrayValue element that specifies a **data type** and value in the rich array. If the **c** attribute is not present, then the total number of **CT_ArrayValue** elements MUST be equal to the **r** attribute. If the **c** attribute is present, then the total number of **CT_ArrayValue** elements MUST be equal to the **r** attribute multiplied by the **c** attribute.

Certain data types indicate that the value represents an index as described in the table below.

Value	Meaning
"a"	The **CT_ArrayValue** identifies a rich array. This is a zero-based index. This index MUST reference a **CT_Array** that comes before the current **CT_Array** in the list specified in **CT_ArrayData** (section 2.6.158).
"r"	The **CT_ArrayValue** identifies a **CT_RichValue** specified in section 2.6.175. This is a zero-based index. This index MUST reference a **CT_RichValue** that comes before the **CT_RichValue** that contains the current **CT_Array** in the list specified in **CT_RichValueData** (section 2.6.177).

Attributes:

r: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of rows for the rich array. This number MUST be less than or equal to 1048576.

c: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of columns for the array. This number MUST be less than or equal to 16384.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
   <xsd:complexType name="CT_Array">
     <xsd:sequence>
       <xsd:element name="v" minOccurs="1" maxOccurs="unbounded" type="CT ArrayValue"/>
     </xsd:sequence>
     <xsd:attribute name="r" type="xsd:unsignedInt" use="required"/>
     <xsd:attribute name="c" type="xsd:unsignedInt" use="optional" default="1"/>
   </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.158   CT_ArrayData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: arrayData

A complex type that specifies the values for **rich arrays**.

Child Elements:

a: A CT_Array element that specifies a single rich array.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the count of rich arrays. The number of **CT_Array** elements MUST match this count. This count MUST be less than or equal to 2147483647.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ArrayData">
  <xsd:sequence>
    <xsd:element name="a" minOccurs="0" maxOccurs="unbounded" type="CT_Array"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.159   CT_ArrayValue

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_Array

A complex type that specifies the value and type of an element in a **rich array**.

Attributes:

t: An ST_ArrayValueType attribute that specifies the **data type** of the rich array value.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ArrayValue">
  <xsd:simpleContent>
    <xsd:extension base="x:ST_Xstring">
      <xsd:attribute name="t" type="ST_ArrayValueType" use="optional" default="d"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.160   CT_CustomRichFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_CustomRichFilters

A complex type that specifies a custom **filter** criterion that is associated with a **rich value**.

Attributes:

key: An **ST_RichFilterKey** (section 2.7.38) attribute that specifies the **rich value key** for which the filters is defined.

operator: An **ST_FilterOperator** ([ISO/IEC29500-1:2016] section 18.18.31) attribute that specifies the operator of the custom filter criterion.

val: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the value to be used as a custom filter criterion. The length of this value MUST be less than 65536 characters.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CustomRichFilter">
  <xsd:complexContent>
    <xsd:extension base="x:CT_CustomFilter">
      <xsd:attribute name="key" type="ST RichFilterKey" use="optional"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.161   CT_CustomRichFilters

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFilterColumn

This complex type specifies custom **filter** criteria associated with **rich values**. **Rows** that contain a **cell** within the filter **range** such that the value does not meet the custom filter criteria will be hidden.

Child Elements:

customFilter: A CT_CustomRichFilter element that specifies custom filter criterion that is associated with a rich value.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

and: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies the relationship between custom filter criterion. This attribute only applies when there are two criteria:

Value	Meaning
"false"	The two criteria are related by an OR relationship. That is, for a cell value to meet the custom filter criteria, at least one criterion specified by the **customFilter** child elements MUST be met.
"true"	The two criteria are related by an AND relationship. That is, for a cell value to meet the custom filter criteria, both criteria specified by the **customFilter** child elements MUST be met.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CustomRichFilters">
  <xsd:sequence>
    <xsd:choice minOccurs="1" maxOccurs="2">
      <xsd:element name="customFilter" minOccurs="0" maxOccurs="1"
type="CT_CustomRichFilter"/>
      <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="x:CT_ExtensionList"/>
    </xsd:choice>
  </xsd:sequence>
  <xsd:attribute name="and" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.162 CT_DynamicRichFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFilterColumn

This complex type specifies the dynamic **filter** criteria associated with **rich values**. These criteria are considered dynamic because they can change, either with the data itself (e.g., "above average") or with the current system date (e.g., show values for "today"). For any **cells** within the filter **range** whose values do not meet the specified criteria, the corresponding **rows** will be hidden from view when the filter is applied. This complex type extends the base type **CT_DynamicFilter** ([ISO/IEC29500-1:2016] section 18.3.2.5)

Attributes:

key: An **ST_RichFilterKey** (section 2.7.38) attribute that specifies the **rich value key** for which the filters is defined.

type: An **ST_DynamicFilterType** ([ISO/IEC29500-1:2016] section 18.18.26) attribute that specifies the type of dynamic filter.

val: A **double** ([XMLSCHEMA2/2] section 3.2.5) **attribute** that specifies a minimum value for dynamic filter. It is inclusive for today, yesterday, tomorrow, nextWeek, thisWeek, lastWeek, nextMonth, thisMonth, lastMonth, nextQuarter, thisQuarter, lastQuarter, nextYear, thisYear, lastYear, and yearToDate. The **val** attribute is not required for Q1, Q2, Q3, Q4, M1, M2, M3, M4, M5, M6, M7, M8, M9, M10, M11 and M12. It is exclusive for aboveAverage and belowAverage.

maxVal: A **double** ([XMLSCHEMA2/2] section 3.2.5) attribute that specifies a maximum value for dynamic filter. It is exclusive and required for today, yesterday, tomorrow, nextWeek, thisWeek, lastWeek, nextMonth, thisMonth, lastMonth, nextQuarter, thisQuarter, lastQuarter, nextYear, thisYear, lastYear, and yearToDate.

valIso: A **dateTime** ([XMLSCHEMA2/2] section 3.2.7) attribute that specifies a minimum value for dynamic filter. (See description of the **maxValIso** attribute to understand when the **valIso** attribute is required.)

maxValIso: A **dateTime** ([XMLSCHEMA2/2] section 3.2.7) attribute that specifies a maximum value for dynamic filter. The **maxValIso** attribute is required for today, yesterday, tomorrow, nextWeek, thisWeek, lastWeek, nextMonth, thisMonth, lastMonth, nextQuarter, thisQuarter, lastQuarter, nextYear, thisYear, lastYear, and yearToDate.

The above criteria are based on a value range; that is, if today's date is September 22nd, then the range for thisWeek is the values greater than or equal to September 17 and less than September 24. In the thisWeek range, the lower value is expressed valIso. The higher value is expressed using the **maxValIso** attribute.

These dynamic filters do not require the **valIso** or **maxValIso** attributes:

Q1, Q2, Q3, Q4, M1, M2, M3, M4, M5, M6, M7, M8, M9, M10, M11 and M12.

The above criteria shall not specify the range using **valIso** and **maxValIso** because Q1 starts from M1 to M3, and M1 is January.

These types of dynamic filters use **valIso** and do not use **maxValIso**:

aboveAverage and belowAverage

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DynamicRichFilter">
  <xsd:complexContent>
    <xsd:extension base="x:CT_DynamicFilter">
      <xsd:attribute name="key" type="ST RichFilterKey" use="optional"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.163   CT_Key

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: CT_RichValueStructure

This complex type specifies the **rich value key**.

Attributes:

n: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) **attribute** that specifies the name of the rich value key. This name is case insensitive and MUST be unique in the **CT_RichValueStructure**. This string MUST be less than or equal to 255 characters in length.

t: An ST_RichValueValueType attribute that specifies the **data type** of the value associated with this key.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Key">
  <xsd:attribute name="n" type="x:ST Xstring" use="required"/>
  <xsd:attribute name="t" type="ST_RichValueValueType" use="optional" default="d"/>
</xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.164   CT_RichDateGroupItem

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFilters

This complex type specifies a group of dates or times which are used in a **filter** criteria associated with **rich values**. This complex type extends the base type **CT_DateGroupItem** ([[ISO/IEC29500-1:2016]](#) section 18.3.2.4).

Attributes:

key: An **ST_RichFilterKey** (section 2.7.38) attribute that specifies the **rich value key** for which the filters is defined.

year: An **unsignedShort** ([XMLSCHEMA2/2] section 3.3.23) attribute that specifies the year (4 digits).

month: An **unsignedShort** ([XMLSCHEMA2/2] section 3.3.23) attribute that specifies the month (1-12).

day: An **unsignedShort** ([XMLSCHEMA2/2] section 3.3.23) attribute that specifies the day (1-31).

hour: An **unsignedShort** ([XMLSCHEMA2/2] section 3.3.23) attribute that specifies the hour (0-23).

minute: An **unsignedShort** ([XMLSCHEMA2/2] section 3.3.23) attribute that specifies the minute (0-59).

second: An **unsignedShort** ([XMLSCHEMA2/2] section 3.3.23) attribute that specifies the second (0-59).

dateTimeGrouping: An **ST_DateTimeGrouping** ([ISO/IEC29500-1:2016] section 18.18.22) attribute that specifies the grouping level.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichDateGroupItem">
  <xsd:complexContent>
    <xsd:extension base="x:CT_DateGroupItem">
      <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.165   CT_RichFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFilters

This complex type specifies a **filter** criterion associated with **rich values**. **Rows** that contain a rich value within the filter **range** that have **key value pair (KVP)** with value **val** and key **key** will not be hidden by this filter criterion. Rows that do not contain such a rich value will be hidden.

Attributes:

key: An **ST_RichFilterKey** (section 2.7.38) attribute that specifies the **rich value key** for which the filters is defined.

val: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the value to be used as a filter criterion. The length of this value MUST be less than 65536 characters.

blank: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the filter criterion includes blank values.

nodata: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the filter includes values that do not have the specified rich value key.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichFilter">
  <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
  <xsd:attribute name="val" type="x:ST Xstring" use="optional"/>
  <xsd:attribute name="blank" type="xsd:boolean" use="optional"/>
  <xsd:attribute name="nodata" type="xsd:boolean" use="optional"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.166 CT_RichFilters

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFilterColumn

This complex type specifies a **filter** with multiple criteria associated with **rich values**.

Child Elements:

filter: A CT_RichFilter element that specifies a filter criterion associated with rich values. **Rows** that contain a rich value within the filter **range** that have a **key value pair (KVP)** with value **val** and key **key** will not be hidden by this filter criterion. Rows that do not contain such a rich value will be hidden.

dateGroupItem: A CT_RichDateGroupItem element that specifies a group of dates or times which are used in a filter criteria associated with rich values.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichFilters">
  <xsd:sequence>
    <xsd:element name="filter" type="CT RichFilter" minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="dateGroupItem" type="CT_RichDateGroupItem" minOccurs="0"
maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.167 CT_RichFormatProperties

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichStylesheet

This complex type specifies a list of properties for **rich value** formats.

Child Elements:

rPr: A CT_RichFormatProperty element that specifies a property for rich value formats.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichFormatProperties">
  <xsd:sequence>
    <xsd:element name="rPr" minOccurs="1" maxOccurs="unbounded"
type="CT_RichFormatProperty"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.168 CT_RichFormatProperty

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFormatProperties

This complex type specifies a property for **rich value** formats.

Attributes:

n: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the property.

t: An ST_RichFormatPropertyType attribute that specifies the **data type** of the property.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichFormatProperty">
  <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="t" type="ST RichFormatPropertyType" use="required"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.169 CT_RichSortCondition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: richSortCondition, CT_SortRule

This complex type specifies **sort conditions** associated with **rich values**.

Attributes:

richSortKey: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the **rich value key** for which the sort condition is defined. This string MUST be less than or equal to of 255 characters in length.

descending: A boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies the direction of the **sort**.

Value	Meaning
"false"	If **sortBy** is "value", sort in ascending order. If **sortBy** is "cellColor" or "fontColor", cells in which the cell color or cell font color specified by **dxfId** occurs are ordered at the top of the range. If **sortBy** is "icon", cells in which the icon specified by **iconSet** and **iconId** occurs are ordered at the top of the range.
"true"	If **sortBy** is "value", sort in descending order. If **sortBy** is "cellColor" or "fontColor", cells in which the cell color or cell font color specified by **dxfId** occurs are ordered at the bottom of the range. If **sortBy** is "icon", cells in which the icon specified by **iconSet** and **iconId** occurs are ordered at the bottom of the range.

sortBy: An **ST_SortBy** ([ISO/IEC29500-1:2016] section 18.18.72) attribute that specifies how the cells in a range are sorted.

ref: An **ST_Ref** ([ISO/IEC29500-1:2016] section 18.18.62) attribute that specifies the **row** or **column** to which this sort condition applies. This value MUST be contained within the **ref** in the **sortState** ([ISO/IEC29500-1:2016] section 18.3.1.92) element that precedes this element. If the **sortState.columnSort** attribute that precedes this element is "false", this value specifies the column to which this sort condition applies and there MUST be only a single column specified by **ref**. If the **sortState.columnSort** attribute that precedes this element is "true", this value specifies the row to which this sort condition applies and there MUST be only a single row specified by **ref**.

customList: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies a comma-delimited list of strings that specifies a custom **sort order**. The order of strings in the list specifies the sort order. When a cell value matches a string in the list, it is sorted ahead of the cell values that match a later string in the list, and so on for each cell in the range. MUST be ignored if **sortBy** is not equal to "value".

dxfId: An **ST_DxfId** ([ISO/IEC29500-1:2016] section 18.18.25) attribute that specifies the format identifier when **sortBy** equals "cellColor" or **sortBy** equals "fontColor". MUST NOT be present if **sortBy** equals "icon" or "value".

iconSet: An [ST_IconSetType](#) attribute that specifies the icon set when **sortBy** equals "icon". The absence of this attribute means no icon. MUST NOT be present if **sortBy** is not equal to "icon".

iconId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the zero-based index of an icon in an **icon set**. If the icon set specified by **iconSet** has three icons, this value MUST be less than or equal to 2. If the icon set specified by **iconSet** has four icons, this value MUST be less than or equal to 3. If the icon set specified by **iconSet** has five icons, this value MUST be less than or equal to 4. The absence of this attribute means no icon. MUST NOT be present if **sortBy** is not equal to "icon".

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichSortCondition">
  <xsd:complexContent>
    <xsd:extension base="x2:CT_SortCondition">
      <xsd:attribute name="richSortKey" type="x:ST_Xstring" use="optional"/>
    </xsd:extension>
```

```
        </xsd:complexContent>
      </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.170   CT_RichStyle

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichStyles

This complex type specifies a list of properties and optional style differential formats (DXFs) ([ISO/IEC29500-1:2016] section 18.8) associated with **rich values**.

Child Elements:

rpv: A CT_RichStylePropertyValue element that specifies the value of and identifier to the **CT_RichFormatProperty** (section 2.6.168).

Attributes:

dxfid: An **ST_DxfId** ([ISO/IEC29500-1:2016] section 18.18.25) attribute that specifies the identifier to **CT_Dxfs** ([ISO/IEC29500-4:2016] section A.2) in the styles part. This is a zero-based index. See [ISO/IEC29500-1:2016] section 18.8.30 in Style for more information on formats. This simple type's contents are a restricted by the **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) data type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_RichStyle">
      <xsd:sequence>
        <xsd:element name="rpv" minOccurs="0" maxOccurs="unbounded"
    type="CT RichStylePropertyValue"/>
      </xsd:sequence>
      <xsd:attribute name="dxfid" type="x:ST_DxfId" use="optional"/>
    </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.171   CT_RichStylePropertyValue

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichStyle

This complex type specifies the value of and identifier to a **CT_RichFormatProperty** (section 2.6.168).

Attributes:

i: An **unsignedInt** ([XMLSCHEMA2/2] 3.3.22) attribute that specifies the identifier to a **CT_RichFormatProperty**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_RichStylePropertyValue">
      <xsd:simpleContent>
```

```
    <xsd:extension base="xsd:string">
      <xsd:attribute name="i" type="xsd:unsignedInt" use="required"/>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.172   CT_RichStyles

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichStylesheet

This complex type specifies a list of **styles** associated with **rich values**.

Child Elements:

rSty: A CT_RichStyle element that specifies a list of properties and optional style differential formats (DXFs) ([ISO/IEC29500-1:2016] section 18.8) associated with rich values.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichStyles">
  <xsd:sequence>
    <xsd:element name="rSty" minOccurs="1" maxOccurs="unbounded" type="CT RichStyle"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.173   CT_RichStylesheet

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: richStyleSheet

This complex type contains **style** information associated with **rich values**.

Child Elements:

dxfs: A **CT_Dxfs** ([ISO/IEC29500-4:2016] section A.2) element that specifies the list of style differential formats (DXFs), as specified in [ISO/IEC29500-1:2016] section 18.8.

richProperties: A CT_RichFormatProperties element that specifies a list of properties for rich value formats.

richStyles: A CT_RichStyles element that specifies a list of styles associated with rich values.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichStylesheet">
  <xsd:sequence>
```

```
        <xsd:element name="dxfs" type="x:CT Dxfs" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="richProperties" type="CT_RichFormatProperties" minOccurs="0"
maxOccurs="1"/>
        <xsd:element name="richStyles" type="CT_RichStyles" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.174   CT_RichTop10

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFilterColumn

This complex type specifies a **top N filter** or **bottom N filter**. This complex type extends the base type **CT_Top10** ([ISO/IEC29500-1:2016] section 18.3.2.10).

Attributes:

key: An **ST_RichFilterKey** (section 2.7.38) attribute that specifies the **rich value key** for which the **filters** is defined.

top: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether a top N filter or a bottom N filter is applied. True indicates a top N filter is applied. False indicates a bottom N filter is applied.

percent: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether the top N filter or bottom N filter is based on a percentage of the total sum of values in the **column** or not. True indicates value filters by a percent value of the column. False indicates value filters by number of items.

val: A **double** ([XMLSCHEMA2/2] section 3.2.5) attribute that specifies the top or bottom value to use as the filter criteria.

filterVal: A **double** ([XMLSCHEMA2/2] section 3.2.5) attribute that specifies the actual cell value or **rich value data** in the range which is used to perform the comparison for this filter.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT RichTop10">
  <xsd:complexContent>
    <xsd:extension base="x:CT_Top10">
      <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.175   CT_RichValue

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: CT_RichValueData

This complex type specifies **rich value data** information for a single **rich value**.

Child Elements:

fb: A CT_RichValueFallback element that specifies the **rich value fallback**.

v: A CT_Value element that specifies a value contained in the rich value as part of a **key value pair (KVP)**. The **rich value key** and **data type** is determined by matching the index of the **CT_Value** with the index of the **CT_Key** (section 2.6.163) in the **CT_RichValueStructure** (section 2.6.180) identified by the **s** attribute.

Certain data types indicate that the value represents an index as described in the table below.

Value	Meaning
"a"	The **CT_Value** identifies a **CT_Array** specified in section 2.6.157. This is a zero-based index.
"r"	The **CT_Value** identifies a **CT_RichValue** specified in this section. This is a zero-based index. This index MUST reference a **CT_RichValue** that comes before the current **CT_RichValue** in the list specified in **CT_RichValueData** (section 2.6.177).
"spb"	The **CT_Value** identifies a **CT_SupportingPropertyBag** specified in section 2.6.188. This is a zero-based index.

Attributes:

s: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the identifier to the **CT_RichValueStructure** (section 2.6.180). This is a zero-based index.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValue">
  <xsd:sequence>
    <xsd:element name="fb" minOccurs="0" maxOccurs="1" type="CT RichValueFallback"/>
    <xsd:element name="v" minOccurs="1" maxOccurs="unbounded" type="CT Value"/>
  </xsd:sequence>
  <xsd:attribute name="s" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.176 CT_RichValueBlock

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: rvb

This complex type specifies the identifier for the **CT_RichValue** (section 2.6.175).

Attributes:

i: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the identifier for the **CT_RichValue** (section 2.6.175). This is a zero-based index.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValueBlock">
  <xsd:attribute name="i" type="xsd:unsignedInt" use="required"/>
```

```
        </xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.177   CT_RichValueData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: rvData

This complex type specifies a list of **rich value data** elements.

Child Elements:

rv: A CT_RichValue element that specifies rich value data information for a single **rich value**

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the count of **CT_RichValue** elements. The number of **CT_RichValue** elements MUST match this count. This count MUST be less than or equal to 2147483647.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_RichValueData">
      <xsd:sequence>
        <xsd:element name="rv" minOccurs="0" maxOccurs="unbounded" type="CT_RichValue"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.178   CT_RichValueFallback

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: CT_RichValue

This complex type specifies the **rich value fallback**.

Attributes:

t: An ST_RichValueFallbackType attribute that specifies the **data type** of the rich value fallback.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_RichValueFallback">
      <xsd:simpleContent>
        <xsd:extension base="xsd:string">
          <xsd:attribute name="t" type="ST RichValueFallbackType" use="optional" default="n"/>
        </xsd:extension>
```

```
        </xsd:simpleContent>
      </xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.179   CT_RichValueGlobalType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichValueTypesInfo

This complex type specifies information that applies to all **rich value types**.

Child Elements:

keyFlags: A CT_RichValueTypeKeyFlags element that specifies the values of **rich value key flags** that differ from the defaults for all rich value types. See sections under section 2.3.6.1 for specific type definitions.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_RichValueGlobalType">
      <xsd:sequence>
        <xsd:element name="keyFlags" minOccurs="0" maxOccurs="1"
   type="CT_RichValueTypeKeyFlags"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
    </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.180   CT_RichValueStructure

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: CT_RichValueStructures

This complex type specifies the structure for one or more **rich values**.

Child Elements:

k: A CT_Key element that specifies the **rich value key**.

Attributes:

t: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the **rich value type**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_RichValueStructure">
      <xsd:sequence>
        <xsd:element name="k" minOccurs="1" maxOccurs="unbounded" type="CT Key"/>
      </xsd:sequence>
```

```
          <xsd:attribute name="t" type="xsd:string" use="required"/>
     </xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.181 CT_RichValueStructures

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: rvStructures

This complex type specifies the list of **rich value** structures.

Child Elements:

s: A CT_RichValueStructure element that specifies the structure for one or more rich values**.**

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the count of **supporting property bag** child elements. The number of **CT_RichValueStructure** elements MUST match this count. This count MUST be less than or equal to 2147483647.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
     <xsd:complexType name="CT_RichValueStructures">
       <xsd:sequence>
         <xsd:element name="s" minOccurs="0" maxOccurs="unbounded" type="CT_RichValueStructure"/>
         <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
       </xsd:sequence>
       <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
     </xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.182 CT_RichValueType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichValueTypes

This complex type specifies information about a single **rich value type**.

Child Elements:

keyFlags: A CT_RichValueTypeKeyFlags element that specifies the set of **rich value key flags** that differ from defaults for the rich value type identified by the **name** attribute.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the rich value type. This string MUST be less than or equal to of 255 characters in length.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT RichValueType">
  <xsd:sequence>
    <xsd:element name="keyFlags" minOccurs="0" maxOccurs="1"
type="CT_RichValueTypeKeyFlags"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:string" use="required"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.183 CT_RichValueTypeKeyFlags

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichValueGlobalType, CT_RichValueType

This complex type specifies a collection of **CT_RichValueTypeReservedKey** elements.

Child Elements:

key: A CT_RichValueTypeReservedKey element that specifies a **rich value key** with **rich value key flags** that apply to it.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValueTypeKeyFlags">
  <xsd:sequence>
    <xsd:element name="key" minOccurs="1" maxOccurs="unbounded"
type="CT_RichValueTypeReservedKey"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.184 CT_RichValueTypeReservedKey

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichValueTypeKeyFlags

This complex type specifies a **rich value key** with **rich value key flags** that apply to it.

Child Elements:

flag: A CT_RichValueTypeReservedKeyFlag element that specifies information for the rich value key flag.

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the rich value key.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValueTypeReservedKey">
  <xsd:sequence>
    <xsd:element name="flag" minOccurs="1" maxOccurs="unbounded"
type="CT_RichValueTypeReservedKeyFlag"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:string" use="required"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.185   CT_RichValueTypeReservedKeyFlag

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichValueTypeReservedKey

This complex type specifies information for the **rich value key flag**.

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the rich value key flag.

value: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies the value for the rich value key flag.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValueTypeReservedKeyFlag">
  <xsd:attribute name="name" type="xsd:string" use="required"/>
  <xsd:attribute name="value" type="xsd:boolean" use="required"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.186   CT_RichValueTypes

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichValueTypesInfo

This complex type specifies a collection of elements that specify information about **rich value types**.

Child Elements:

type: A CT_RichValueType element that specifies information about a single rich value type.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValueTypes">
  <xsd:sequence>
    <xsd:element name="type" minOccurs="0" maxOccurs="unbounded" type="CT_RichValueType"/>
  </xsd:sequence>
```

```
    </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.187   CT_RichValueTypesInfo

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: rvTypesInfo

This complex type specifies two groupings of information. One applies to all **rich value types**, and the other only applies to the identified rich value types.

Child Elements:

global: A CT_RichValueGlobalType element that specifies information that applies to all rich value types.

types: A CT_RichValueTypes element that specifies information about identified rich value types.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValueTypesInfo">
  <xsd:sequence>
    <xsd:element name="global" minOccurs="0" maxOccurs="1" type="CT_RichValueGlobalType"/>
    <xsd:element name="types" minOccurs="0" maxOccurs="1" type="CT_RichValueTypes"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.188   CT_SupportingPropertyBag

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBagData

This complex type specifies **supporting property bag data** information for a single **supporting property bag**.

Child Elements:

v: A CT_SupportingPropertyBagValue element that specifies a value contained in the supporting property bag as part of a **key value pair (KVP)**. The **supporting property bag key** and **data type** is determined by matching the index of the **CT_SupportingPropertyBagValue** with the index of the **CT_SupportingPropertyBagKey** (section 2.6.193) in the **CT_SupportingPropertyBagStructure** (section 2.6.195) identified by the **s** attribute.

Certain data types indicate that the value represents an index as described in the table below.

Value	Meaning
"spb"	The **CT_SupportingPropertyBagValue** identifies a **CT_SupportingPropertyBag** specified in section 2.6.188. This is a zero-based index. This index MUST reference a **CT_SupportingPropertyBag** that comes before the current **CT_SupportingPropertyBag** in the list specified in **CT_SupportingPropertyBagData** (section 2.6.192).
"spba"	The **CT_SupportingPropertyBagValue** identifies a **CT_SupportingPropertyBagArray** specified in section 2.6.189. This is a zero-based index.

Attributes:

s: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the identifier to the **CT_SupportingPropertyBagStructure** (section 2.6.195). This is a zero-based index.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SupportingPropertyBag">
  <xsd:sequence>
    <xsd:element name="v" minOccurs="1" maxOccurs="unbounded"
type="CT_SupportingPropertyBagValue"/>
  </xsd:sequence>
  <xsd:attribute name="s" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.189   CT_SupportingPropertyBagArray

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBagArrayData

This complex type specifies a collection of values and **data types** of elements in a **supporting property bag array**.

Child Elements:

v: A CT_SupportingPropertyBagArrayValue element that specifies the value and data type of a single element in a supporting property bag array.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the count of elements in the supporting property bag array. The number of **CT_SupportingPropertyBagArrayValue** elements MUST match this count.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT SupportingPropertyBagArray">
  <xsd:sequence>
    <xsd:element name="v" minOccurs="1" maxOccurs="unbounded"
type="CT_SupportingPropertyBagArrayValue"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
```

```
    </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.190   CT_SupportingPropertyBagArrayData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBags

This complex type specifies a list of **supporting property bag arrays**.

Child Elements:

a: A CT_SupportingPropertyBagArray element that specifies a collection of values and **data types** of elements in a supporting property bag array.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the count of supporting property bag arrays. The number of **CT_SupportingPropertyBagArray** elements MUST match this count.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT SupportingPropertyBagArrayData">
      <xsd:sequence>
        <xsd:element name="a" minOccurs="0" maxOccurs="unbounded"
    type="CT_SupportingPropertyBagArray"/>
        <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.191   CT_SupportingPropertyBagArrayValue

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBagArray

This complex type specifies the value and **data type** of an element in a **supporting property bag array**.

Attributes:

t: An ST_SupportingPropertyBagArrayValueType attribute that specifies the data type of the supporting property bag array value.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_SupportingPropertyBagArrayValue">
```

```
    <xsd:simpleContent>
      <xsd:extension base="x:ST_Xstring">
        <xsd:attribute name="t" type="ST_SupportingPropertyBagArrayValueType" use="optional"
default="d"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.192 CT_SupportingPropertyBagData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBags

This complex type specifies a list of **supporting property bag data**.

Child Elements:

spb: A CT_SupportingPropertyBag element that specifies the supporting property bag data information for a single **supporting property bag**.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the count of supporting property bags. The number of **CT_SupportingPropertyBag** elements MUST match this count.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
  <xsd:complexType name="CT_SupportingPropertyBagData">
    <xsd:sequence>
      <xsd:element name="spb" minOccurs="0" maxOccurs="unbounded"
type="CT_SupportingPropertyBag"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.193 CT_SupportingPropertyBagKey

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBagStructure

This complex type specifies the **supporting property bag key**.

Attributes:

n: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the name of the key. This name is case sensitive and MUST be unique in the **CT_SupportingPropertyBagStructure**.

t: An ST_SupportingPropertyBagValueType attribute that specifies the data type of the value associated with this key.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT SupportingPropertyBagKey">
  <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="t" type="ST SupportingPropertyBagValueType" use="optional"
default="d"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.194   CT_SupportingPropertyBags

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: supportingPropertyBags

This complex type specifies a list of **supporting property bag data**.

Child Elements:

spbArrays: A CT_SupportingPropertyBagArrayData element that specifies a list of **supporting property bag arrays**.

spbData: A CT_SupportingPropertyBagData element that specifies a list of supporting property bag data.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SupportingPropertyBags">
  <xsd:sequence>
    <xsd:element name="spbArrays" minOccurs="0" maxOccurs="1"
type="CT_SupportingPropertyBagArrayData"/>
    <xsd:element name="spbData" minOccurs="1" maxOccurs="1"
type="CT_SupportingPropertyBagData"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.195   CT_SupportingPropertyBagStructure

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBagStructures

This complex type specifies the **supporting property bag** structure for one or more supporting property bags.

Child Elements:

k: A CT_SupportingPropertyBagKey element that specifies the **supporting property bag key**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT SupportingPropertyBagStructure">
  <xsd:sequence>
    <xsd:element name="k" minOccurs="1" maxOccurs="unbounded"
type="CT_SupportingPropertyBagKey"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.196   CT_SupportingPropertyBagStructures

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: spbStructures

This complex type specifies a list of **supporting property bag** structures.

Child Elements:

s: A CT_SupportingPropertyBagStructure element that specifies the supporting property bag structure for one or more supporting property bags.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

count: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the count of supporting property bag structures. The number of **CT_SupportingPropertyBagStructure** elements MUST match this count.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SupportingPropertyBagStructures">
  <xsd:sequence>
    <xsd:element name="s" minOccurs="0" maxOccurs="unbounded"
type="CT_SupportingPropertyBagStructure"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.197   CT_SupportingPropertyBagValue

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBag

This complex type specifies the **supporting property bag data**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SupportingPropertyBagValue">
  <xsd:simpleContent>
    <xsd:extension base="x:ST_Xstring"/>
```

```
    </xsd:simpleContent>
  </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.198   CT_Value

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: CT_RichValue

This complex type specifies the **rich value data**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_Value">
      <xsd:simpleContent>
        <xsd:extension base="x:ST Xstring"/>
      </xsd:simpleContent>
    </xsd:complexType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.199   CT_CalcFeature

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/calcfeatures

Referenced by: CT_CalcFeatures

This complex type specifies the name of a calculation engine feature that was present when the workbook was **calculated**.

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the calculation engine feature.

Name	Calculation Engine Feature
"microsoft.com:RD"	Rich data (section 2.3.6) was present in the calculation engine
"microsoft.com:FV"	_FV or FIELDVALUE functions were present in the calculation engine
"microsoft.com:Single"	The SINGLE function was present in the calculation engine
"Microsoft.com:LET_WF"	The LET function was present in the calculation engine

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_CalcFeature">
      <xsd:attribute name="name" type="xsd:string" use="required"/>
    </xsd:complexType>
```

See section 5.22 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.200   CT_CalcFeatures

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/calcfeatures

Referenced by: calcFeatures

This element specifies a list of **CT_CalcFeature** elements (section 2.6.199).

Child Elements:

feature: A CT_CalcFeature element that specifies a calculation engine feature.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CalcFeatures">
  <xsd:sequence>
    <xsd:element name="feature" minOccurs="1" maxOccurs="unbounded" type="CT_CalcFeature"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.22 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.201   CT_RichFilterColumn

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: filterColumn

This complex type specifies **filter** information associated with **rich values**.

Child Elements:

filters: A CT_RichFilters element that specifies a filter with multiple criteria associated with rich values.

top10: A CT_RichTop10 element that specifies a **top N filter** or **bottom N filter**.

customFilters: A CT_CustomRichFilters element that specifies custom filter criteria associated with rich values. **Rows** that contain a **cell** within the filter **range** such that the value does not meet the custom filter criteria will be hidden.

dynamicFilter: A CT_DynamicRichFilter element that specifies the dynamic filter criteria associated with rich values. These criteria are considered dynamic because they can change, either with the data itself (e.g., "above average") or with the current system date (e.g., show values for "today"). For any cells within the filter range whose values do not meet the specified criteria, the corresponding rows will be hidden from view when the filter is applied.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichFilterColumn">
  <xsd:choice minOccurs="0" maxOccurs="1">
    <xsd:element name="filters" type="CT_RichFilters"/>
```

```
        <xsd:element name="top10" type="CT RichTop10"/>
        <xsd:element name="customFilters" type="CT_CustomRichFilters"/>
        <xsd:element name="dynamicFilter" type="CT_DynamicRichFilter"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList"/>
      </xsd:choice>
    </xsd:complexType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.202 CT_Mention

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

Referenced by: CT_ThreadedCommentMentions

This complex type specifies the properties of a **mention** in a **threaded comment**.

Attributes:

mentionpersonId: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier for the person mentioned. This attribute MUST correspond to the **id** specified in **CT_Person** (section 2.6.203).

mentionId: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier for this mention.

startIndex: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the index in comment text where the mention starts.

length: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of characters in the mention from **startIndex**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT Mention">
      <xsd:attribute name="mentionpersonId" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="mentionId" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="startIndex" type="xsd:unsignedInt" use="required"/>
      <xsd:attribute name="length" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.203 CT_Person

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

Referenced by: CT_PersonList

This complex type specifies the information about an author of a comment or a person mentioned in a comment.

Child Elements:

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

displayName: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the display name of the person.

id: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier for the person.

userId: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies a provider issued user identifier for the person.

providerId: An **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) attribute that specifies the provider type of the person's information.

This table lists example values of the **providerId** attribute and the corresponding meanings of the **userId** attribute.

Identity Provider	providerId value	userId value	Description of userId value
No Provider	"None"	"Name"	Author's name
Active Directory	"AD"	SID	Active Directory Security Identifier (as specified in [MS-DTYP] section 2.4.2)
Windows Live ID	"Windows Live"	CID	A 64-bit signed decimal that uniquely identifies a user on Windows Live.
Office 365	"AD"	O365ID	A string that uniquely identifies a user. It SHOULD be comprised of three individual values separated by a "::" character delimiter.
People Picker	"PeoplePicker"	"Email address"	An **email address** provided by People Picker

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Person">
  <xsd:sequence>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="displayName" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
  <xsd:attribute name="userId" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="providerId" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.204 CT_PersonList

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

Referenced by: personList

This complex type specifies a collection of persons.

Child Elements:

person: A CT_Person element that specifies each person's information in the collection.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT PersonList">
  <xsd:sequence>
    <xsd:element name="person" type="CT Person" minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.205   CT_ThreadedComment

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

Referenced by: CT_ThreadedComments

This complex type specifies the properties of a **threaded comment**.

Child Elements:

text: An ST_Xstring ([ISO/IEC29500-1:2016] section 22.9.2.19) element that specifies the unformatted text of this comment.

mentions: A CT_ThreadedCommentMentions element that specifies a list of **mentions** in this comment.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element**.**

Attributes:

ref: An **ST_Ref** (section 2.7.1) attribute that specifies the reference to the cell that this threaded comment is anchored to.

dT: A **dateTime** ([XMLSCHEMA2/2] section 3.2.7) attribute that specifies the UTC time that the comment was authored for the first time.

personId: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier for the comment author. This attribute MUST correspond to the **id** specified in **CT_Person** (section 2.6.203).

id: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies a unique identifier for this threaded comment.

parentId: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the **id** of the parent comment of this comment in the **comment thread**.

done: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies a flag to track resolving status of the comment.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ThreadedComment">
  <xsd:sequence>
```

```
        <xsd:element name="text" type="x:ST Xstring" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="mentions" type="CT_ThreadedCommentMentions" minOccurs="0"
    maxOccurs="1"/>
        <xsd:element name="extLst" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="ref" type="x:ST Ref" use="optional"/>
      <xsd:attribute name="dT" type="xsd:dateTime" use="optional"/>
      <xsd:attribute name="personId" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="parentId" type="x:ST_Guid" use="optional"/>
      <xsd:attribute name="done" type="xsd:boolean" use="optional"/>
    </xsd:complexType>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.206   CT_ThreadedCommentMentions

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

Referenced by: CT_ThreadedComment

This complex type specifies a collection of **mentions** in a **threaded comment**.

Child Elements:

mention: A CT_Mention element that specifies each mention in the collection and its properties.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_ThreadedCommentMentions">
      <xsd:sequence>
        <xsd:element name="mention" type="CT_Mention" minOccurs="0" maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.207   CT_ThreadedComments

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments

Referenced by: ThreadedComments

This complex type specifies a collection of **threaded comment** in a **comment thread**.

Child Elements:

threadedComment: A CT_ThreadedComment element that specifies each threaded comment in the comment thread and its properties.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
    <xsd:complexType name="CT_ThreadedComments">
      <xsd:sequence>
```

```
      <xsd:element name="threadedComment" type="CT ThreadedComment" minOccurs="0"
  maxOccurs="unbounded"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
```

See section 5.23 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.208   CT_DynamicArrayProperties

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/dynamicarray

Referenced by: dynamicArrayProperties

This complex type defines properties related to a **dynamic array**.

Child Elements:

extLst: A **CT_ExtensionList** ([ISO/IEC29500-4:2016] section A.2) element that specifies future extensibility for this element.

Attributes:

fDynamic: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies a flag indicating the presence of a dynamic array.

fCollapsed: A **Boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute which MUST be ignored and MUST be 0.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
  <xsd:complexType name="CT_DynamicArrayProperties">
    <xsd:sequence>
      <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="fDynamic" type="xsd:boolean" use="optional"/>
    <xsd:attribute name="fCollapsed" type="xsd:boolean" use="optional"/>
  </xsd:complexType>
```

See section 5.25 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.209   CT_ColumnFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews

Referenced by: CT_NsvFilter

This complex type defines filter criteria that is used on a specific column as part of a **named sheet view**

Child Elements:

dxf: A **CT_Dxf** ([ISO/IEC29500-1:2016] section A.2). If the **filter** element within this type includes a **colorFilter** ([ISO/IEC29500-1:2016] section 18.3.2.1) then this element MUST be present and MUST be used in place of the one referenced by the **dxfId** attribute on the **colorFilter**. If the **filter** element within this type does NOT include a **colorFilter** ([ISO/IEC29500-1:2016] section 18.3.2.1) then this element MUST be omitted.

filter: A **CT_FilterColumn** ([ISO/IEC29500-1:2016] section A.2). Defines the filter conditions to apply**.**

extLst: A **CT_ExtensionList** ([ISO/IEC29500-1:2016] section A.2) that specifies future extensibility for this element.

Attributes:

colId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the zero-based index of the column that this filter is applied to. When loading this element **colId** and **id** SHOULD be considered as described in section 2.3.8.2.

id: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the column this filter is applied to. When loading this element **colId** and **id** SHOULD be considered as described in section 2.3.8.2.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ColumnFilter">
  <xsd:sequence>
    <xsd:element name="dxf" type="x:CT_Dxf" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="filter" minOccurs="0" maxOccurs="unbounded" type="x:CT FilterColumn"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attributeGroup ref="AG_ColumnId"/>
</xsd:complexType>
```

See section 5.26 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.210 CT_NamedSheetView

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews

Referenced by: CT_NamedSheetViews

This complex type specifies the properties of a **named sheet view**

Child Elements:

nsvFilter: A CT_NsvFilter element that specifies the sort and/or filter criteria to be applied to a specified **AutoFilter**

extLst: A **CT_ExtensionList** ([ISO/IEC29500-1:2016] section A.2) that specifies future extensibility for this element

Attributes:

name: A **string** ([XMLSCHEMA2/2] section 3.2.1) attribute that specifies the name of the named sheet view. The value of this attribute MUST be unique among elements within a **CT_NamedSheetViews** (section 2.6.211)

The number of characters in the string MUST be greater than or equal to 1 and less than or equal to 127. The string MUST conform to the following **Augmented Backus-Naur Form (ABNF)** ([RFC5234]) grammar:

```
string = name-character-special [*name-character name-character-special]
whitespace = %x09-%x0D / " "
name-character-special = character ; MUST NOT be ";" or whitespace
```

```
; character = as defined by the production of Char in the [W3C-XML] section 2.2
name-character = name-character-special / " "
```

Values beginning with "_xlnsv." are reserved for future use.

id: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_NamedSheetView">
  <xsd:sequence>
    <xsd:element name="nsvFilter" type="CT_NsvFilter" minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:string" use="required"/>
  <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
</xsd:complexType>
```

See section 5.26 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.211   CT_NamedSheetViews

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews

Referenced by: namedSheetViews

This complex type specifies a collection of **named sheet views**.

Child Elements:

namedSheetView: A CT_NamedSheetView element that specifies a single named sheet view.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-1:2016] section A.2) that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_NamedSheetViews">
  <xsd:sequence>
    <xsd:element name="namedSheetView" type="CT_NamedSheetView" minOccurs="0"
maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.26 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.212   CT_NsvFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews

Referenced by: CT_NamedSheetView

This complex type specifies the sort and/or filter criteria to be applied to a single **AutoFilter**.

Child Elements:

columnFilter: A [CT_ColumnFilter](#) element that specifies filter criteria to apply to a specific column in the AutoFilter.

sortRules: A [CT_SortRules](#) element that specifies the sort criteria to apply to the AutoFilter.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-1:2016](#) section A.2) that specifies future extensibility for this element.

Attributes:

filterId: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the AutoFilter object this element applies to. The value of this attribute SHOULD match a **uid** (section [2.5.10](#)) attribute stored on the **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2) that describes the AutoFilter associated with this element.

Use of this attribute during load is described in section [2.3.8.2](#).

ref: An **ST_Ref** ([ISO/IEC29500-1:2016] section 18.18.62) attribute that specifies the location of the AutoFilter object that this element applies to. The value of this attribute SHOULD match the **ref** attribute on the **CT_AutoFilter** ([ISO/IEC29500-1:2016] section A.2) that describes the AutoFilter associated with this element.

This attribute is currently unused.

tableId: An **unsignedInt** ([XMLSCHEMA2/2](#) section 3.3.22) attribute that specifies the **id** of the **table** that contains the AutoFilter associated with this element.

If the AutoFilter is table owned (as explained in section [2.3.8.1](#)) then this value SHOULD match the **id** attribute on the **CT_Table** ([ISO/IEC29500-1:2016] section A.2) element that describes the owning table.

If the AutoFilter is worksheet owned (as explained in section 2.3.8.1) then this value SHOULD be 0.

Use of this attribute during load is described in section 2.3.8.2

The following W3C XML Schema ([XMLSCHEMA1/2](#) section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_NsvFilter">
  <xsd:sequence>
    <xsd:element name="columnFilter" minOccurs="0" maxOccurs="unbounded"
type="CT_ColumnFilter"/>
    <xsd:element name="sortRules" minOccurs="0" maxOccurs="1" type="CT_SortRules"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="filterId" type="x:ST_Guid" use="required"/>
  <xsd:attribute name="ref" type="x:ST_Ref" use="optional"/>
  <xsd:attribute name="tableId" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
```

See section [5.26](#) for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.213   CT_SortRule

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews

Referenced by: [CT_SortRules](#)

This complex type specifies the sort criteria to be applied to a single column as part of a **named sheet view**.

Child Elements:

dxf: A **CT_Dxf** (). If the **sortCondition** element within this type specifies a **dxfId** attribute then this element MUST be present and MUST be used in place of the one referenced by that **dxfId** attribute. If the **sortCondition** element within this type does NOT specify a **dxfId** attribute then this element MUST be omitted.

sortCondition: A CT_SortCondition element that specifies the **sort condition** to apply to the column.

richSortCondition: A CT_RichSortCondition element that specifies the sort condition associated with **rich values**. To apply to the column.

Attributes:

colId: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the zero-based index of the column that this filter is applied to. When loading this element **colId** and **id** SHOULD be considered as described in section 2.3.8.2.

id: An **ST_Guid** ([ISO/IEC29500-1:2016] section 22.9.2.4) attribute that specifies the unique id of the column this filter is applied to. When loading this element **colId** and **id** SHOULD be considered as described in section 2.3.8.2.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SortRule">
  <xsd:sequence>
    <xsd:element name="dxf" type="x:CT_Dxf" minOccurs="0" maxOccurs="1"/>
    <xsd:choice minOccurs="0" maxOccurs="1">
      <xsd:element name="sortCondition" minOccurs="0" maxOccurs="1"
type="x14:CT_SortCondition"/>
      <xsd:element name="richSortCondition" minOccurs="0" maxOccurs="1"
type="xlrd2:CT RichSortCondition"/>
    </xsd:choice>
  </xsd:sequence>
  <xsd:attributeGroup ref="AG_ColumnId"/>
</xsd:complexType>
```

See section 5.26 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.214   CT_SortRules

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews

Referenced by: CT_NsvFilter

This complex type specifies an ordered collection of sort criteria to apply as part of a **named sheet view**.

Child Elements:

sortRule: A CT_SortRule element that specifies the sort criteria to apply on a single column.

extLst: A **CT_ExtensionList** ([ISO/IEC29500-1:2016] section A.2) that specifies future extensibility for this element.

Attributes:

sortMethod: An **ST_SortMethod** ([ISO/IEC29500-1:2016] section A.2) attribute that specifies the sort ordering to use. Behavior of this attribute is equivalent to the **sortMethod** attribute contained on the **sortState** element as specified by [ISO/IEC29500-1:2016] section 18.3.1.92.

caseSensitive: A **boolean** ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether sort is case sensitive or not.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_SortRules">
  <xsd:sequence>
    <xsd:element name="sortRule" minOccurs="0" maxOccurs="64" type="CT_SortRule"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="sortMethod" type="x:ST_SortMethod" use="optional" default="none"/>
  <xsd:attribute name="caseSensitive" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.26 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.215 CT_ExternalLinksPr

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2019/extlinksprops

Referenced by: externalLinksPr

Extended properties applicable to all external links of this workbook.

Attributes:

autoRefresh: A boolean ([XMLSCHEMA2/2] section 3.2.2) attribute that specifies whether to refresh external links periodically.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ExternalLinksPr">
  <xsd:attribute name="autoRefresh" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
```

See section 5.27 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.216 CT_WebImagesSupportingRichData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage

Referenced by: webImagesSrd

This complex type specifies a list of sets of properties associated with web image rich values. For more information see section 2.3.6.1.10.

Child Elements:

webImageSrd: A CT_WebImageSupportingRichData element that specifies a set of properties for a web image **rich value**.

extLst: A CT_ExtensionList ([ISO/IEC29500-1:2016] section A.2) that specifies future extensibility for this element.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT WebImagesSupportingRichData">
  <xsd:sequence>
    <xsd:element name="webImageSrd" minOccurs="0" maxOccurs="unbounded"
type="CT_WebImageSupportingRichData"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.28 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.217 CT_WebImageSupportingRichData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage

Referenced by: CT_WebImagesSupportingRichData

This complex type specifies a set of properties for a web image **rich value**.

Child Elements:

address: A CT_WebImageSupportingRichDataRelationship element that specifies the relationship ID for the hyperlink address.

moreImagesAddress: A CT_WebImageSupportingRichDataRelationship element that specifies the relationship ID for the hyperlink to more images.

blip: A CT_WebImageSupportingRichDataRelationship element that specifies the relationship ID for the **BLIP**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_WebImageSupportingRichData">
  <xsd:sequence>
    <xsd:element name="address" minOccurs="1" maxOccurs="1"
type="CT WebImageSupportingRichDataRelationship"/>
    <xsd:element name="moreImagesAddress" minOccurs="0" maxOccurs="1"
type="CT_WebImageSupportingRichDataRelationship"/>
    <xsd:element name="blip" minOccurs="0" maxOccurs="1"
type="CT_WebImageSupportingRichDataRelationship"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.28 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.218 CT_WebImageSupportingRichDataRelationship

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage

Referenced by: CT_WebImageSupportingRichData

This complex type specifies a relationship to a web image **rich value** property.

Attributes:

r:id: An **ST_RelationshipId** ([ISO/IEC29500-1:2016] section 22.8.2.1) attribute that specifies the ID of the relationship.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_WebImageSupportingRichDataRelationship">
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>
```

See section 5.28 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.219   CT_CommentHyperlink

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/threadedcomments2

Referenced by: CT_ThreadedComments2Ext

This complex type specifies the properties of hyperlinked text in this threaded comment

Child Elements:

extLst: A CT_ExtensionList ([ISO/IEC29500-1:2016] section A.2) element that specifies future extensibility for this element

Attributes:

startIndex: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the index in comment text where this hyperlink starts.

length: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the number of characters in this hyperlink from **startIndex**.

url: An ST_Xstring ([ISO/IEC29500-1:2016] section 22.9.2.19) element that specifies the URL of this hyperlink.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_CommentHyperlink">
  <xsd:sequence>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="startIndex" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="length" type="xsd:unsignedInt" use="required"/>
  <xsd:attribute name="url" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
```

See section 5.30 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.220   CT_ThreadedComments2Ext

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/threadedcomments2

This complex type specifies the information for hyperlinks for this threaded comment.

Child Elements:

checksum: An **unsignedInt** ([XMLSCHEMA2/2] section 3.3.22) attribute that specifies the CRC32 ([MS-OSHARED] section 2.4.3.2) checksum of the full plain text of this threaded comment.

hyperlink: A CT_CommentHyperlink element that specifies the hyperlink.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_ThreadedComments2Ext">
  <xsd:sequence>
    <xsd:element name="checksum" type="xsd:unsignedInt" minOccurs="1" maxOccurs="1"/>
    <xsd:sequence>
      <xsd:element name="hyperlink" type="CT_CommentHyperlink" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.30 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.221 CT_RichValueRefreshInterval

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh

Referenced by: CT_RichValueRefreshIntervals

This complex type specifies the refresh interval for the given **resourceID** attribute.

Attributes:

resourceIdInt: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies the numeric ID for specifying the rich values that this interval applies to. Either resourceIdInt or resourceIdStr MUST be included. Both MAY be included.

resourceIdStr: A **string** ([XMLSCHEMA2/2]section 3.2.1) attribute that specifies the string ID for specifying the rich values that this interval applies to. Either resourceIdInt or resourceIdStr MUST be included. Both MAY be included.

interval: An **int** ([XMLSCHEMA2/2] section 3.3.17) attribute that specifies the refresh interval in seconds for the **resourceID**.

Value	Description
-1	Refresh on load only.
0	No automatic refresh.
Any other value	Time in seconds, MAY be overridden by the **service**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT RichValueRefreshInterval">
  <xsd:attribute name="resourceIdInt" type="xsd:int" use="optional"/>
  <xsd:attribute name="resourceIdStr" type="xsd:string" use="optional"/>
  <xsd:attribute name="interval" type="xsd:int" use="required"/>
</xsd:complexType>
```

See section 5.31 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.222   CT_RichValueRefreshIntervals

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh

Referenced by: refreshIntervals

Specifies a collection of refresh intervals.

Child Elements:

refreshInterval: A CT_RichValueRefreshInterval element that specifies the refresh interval.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_RichValueRefreshIntervals">
  <xsd:sequence>
    <xsd:element name="refreshInterval" minOccurs="1" maxOccurs="unbounded"
type="CT_RichValueRefreshInterval"/>
  </xsd:sequence>
</xsd:complexType>
```

See section 5.31 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.223   CT_DataFieldFutureData

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020

Referenced by: dataFieldFutureData

Specifies a source field for the parent **PivotTable data field** that SHOULD only be used for the specified version of the PivotTable or later.

Attributes:

version: An unsignedByte attribute that specifies a minimum version of the PivotTable for which this record SHOULD be honored.

sourceField: An unsignedInt attribute that specifies the index of the source PivotField for this data field.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_DataFieldFutureData">
  <xsd:attribute name="version" type="xsd:unsignedByte" use="required"/>
  <xsd:attribute name="sourceField" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
```

See section 5.29 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.6.224   CT_Ignorable

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020

Referenced by: ignorableAfterVersion

Specifies that the parent object can be ignored if the PivotTable is greater than or equal to a certain version.

Attributes:

version: An unsignedByte attribute that specifies a minimum version of the PivotTable for which this object SHOULD be ignored.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="CT_Ignorable">
  <xsd:attribute name="version" type="xsd:unsignedByte" use="required"/>
</xsd:complexType>
```

See section 5.29 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7   Simple Types

2.7.1   ST_Ref

Target namespace: http://schemas.microsoft.com/office/excel/2006/main

Referenced by: CT_Ref, ST_Sqref

This simple type specifies a reference to a **range** of **cells**.

This simple type is identical to the **ST_Ref** ([ISO/IEC29500-1:2016] section 18.18.62) simple type with the following exception: This simple type MUST have the following grammar.

```
              (A1-cell [":" A1-cell])  / ref-constant
```

The **ABNF** ([RFC5234]) definitions for A1-cell and ref-constant are specified in Formulas.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_Ref">
  <xsd:restriction base="xsd:string"/>
</xsd:simpleType>
```

See section 5.1 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.2   ST_Sqref

Target namespace: http://schemas.microsoft.com/office/excel/2006/main

Referenced by: CT_Sqref

This simple type specifies a list of **cell ranges**.

This simple type is identical to the **ST_Sqref** ([ISO/IEC29500-1:2016] section 18.18.76) simple type with the following exceptions:

▪   MUST contain zero or more values of type **ST_Ref**.

▪ If the value contains an **ST_Ref** of value "#REF!", then it MUST be the only value in the list.

▪ The number of cell references in this simple type MUST be less than 2,147,483,647.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST Sqref">
  <xsd:list itemType="ST Ref"/>
</xsd:simpleType>
```

See section 5.1 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.3 ST_DispBlanksAs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SparklineGroup

This simple type specifies how empty **cells** are plotted for all **sparklines** in the sparkline group.

Value	Meaning
span	Empty cells are plotted as interpolated.
gap	Empty cells are not plotted.
zero	Empty cells are plotted as zero.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST DispBlanksAs">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="span"/>
    <xsd:enumeration value="gap"/>
    <xsd:enumeration value="zero"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.4 ST_SparklineAxisMinMax

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SparklineGroup

This simple type specifies information about how the vertical axis minimum or maximum is computed for this **sparkline** group.

Value	Meaning
individual	Specifies that the vertical axis minimum or maximum for each sparkline in this sparkline group is calculated automatically such that the **data point** with the **minimum** or maximum value can be displayed in the **plot area**.

Value	Meaning
group	Specifies that the vertical axis minimum or maximum is shared across all sparklines in this sparkline group and is calculated automatically such that the data point with the minimum or maximum value can be displayed in the plot area.
custom	Specifies that the vertical axis minimum or maximum for each sparkline in this sparkline group is specified by the **manualMin** attribute or the **manualMax** attribute of CT_SparklineGroup.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_SparklineAxisMinMax">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="individual"/>
    <xsd:enumeration value="group"/>
    <xsd:enumeration value="custom"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.5 ST_SparklineType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SparklineGroup

This simple type specifies the type of the **sparkline** group.

Value	Meaning
line	Line sparklines.
column	**Column** sparklines.
stacked	100% stacked column sparklines.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_SparklineType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="line"/>
    <xsd:enumeration value="column"/>
    <xsd:enumeration value="stacked"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.6 ST_PivotShowAs

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_DataField

This simple type specifies the display format values for a PivotTable ([ISO/IEC29500-1:2016] section 18.10) **field**.

Value	Meaning
percentOfParent	Percentage of parent total.
percentOfParentRow	Percentage of parent **row** total.
percentOfParentCol	Percentage of parent **column** total.
percentOfRunningTotal	Percentage of running total.
rankAscending	Rank ascending.
rankDescending	Rank descending.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_PivotShowAs">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="percentOfParent"/>
    <xsd:enumeration value="percentOfParentRow"/>
    <xsd:enumeration value="percentOfParentCol"/>
    <xsd:enumeration value="percentOfRunningTotal"/>
    <xsd:enumeration value="rankAscending"/>
    <xsd:enumeration value="rankDescending"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.7 ST_DataBarDirection

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_DataBar

A simple type that specifies the direction of the **data bar**.

Value	Meaning
context	The direction of the data bar is determined by context.
leftToRight	The data bar is displayed in a **left-to-right** manner.
rightToLeft	The data bar is displayed in a **right-to-left** manner.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST DataBarDirection">
  <xsd:restriction base="xsd:string">
```

```
      <xsd:enumeration value="context"/>
      <xsd:enumeration value="leftToRight"/>
      <xsd:enumeration value="rightToLeft"/>
   </xsd:restriction>
 </xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.8 ST_DataBarAxisPosition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_DataBar

A simple type that specifies the axis position for the **data bar**.

Value	Meaning
automatic	The axis position for the data bar is calculated automatically.
middle	The axis position for the data bar is the midpoint of the cell.
none	There is no axis for the data bar.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
   <xsd:simpleType name="ST_DataBarAxisPosition">
     <xsd:restriction base="xsd:string">
       <xsd:enumeration value="automatic"/>
       <xsd:enumeration value="middle"/>
       <xsd:enumeration value="none"/>
     </xsd:restriction>
   </xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.9 ST_CfvoType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_Cfvo

This simple type specifies how the Conditional Formatting Value Object (CFVO) value is determined. In the following table, X represents a parameter value. The value of X is determined by the value of the **f** element in the parent **CT_Cfvo** element. If the **f** element in the parent **CT_Cfvo** element is absent, then the value of X is 0. MUST be a value from the following table.

Value	Meaning
num	X
percent	The minimum value in the **range** of **cells** that the **conditional formatting** rule applies to plus X percent of the difference between the maximum and minimum values in the range of cells that the conditional formatting rule applies to.

Value	Meaning
	For example, if the min and max values in the range are 1 and 10 respectively, and X is 10, then the CFVO value is 1.9.
max	The maximum value from the range of cells that the conditional formatting rule applies to.
min	The minimum value from the range of cells that the conditional formatting rule applies to.
formula	X, or if the **f** element is formed by the numerical-constant rule alone in the grammar provided in Formulas, the formula is ignored and X is 0.
percentile	The minimum value of the cell that is in the X percentile of the range of cells that the conditional formatting rule applies to.
autoMin	The smaller of zero or the minimum value from the range of cells that the conditional formatting rule applies to.
autoMax	The larger of zero or the maximum value from the range of cells that the conditional formatting rule applies to.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_CfvoType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="num"/>
    <xsd:enumeration value="percent"/>
    <xsd:enumeration value="max"/>
    <xsd:enumeration value="min"/>
    <xsd:enumeration value="formula"/>
    <xsd:enumeration value="percentile"/>
    <xsd:enumeration value="autoMin"/>
    <xsd:enumeration value="autoMax"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).
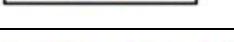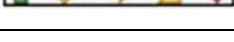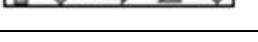
2.7.10 ST_IconSetType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_RichSortCondition, CT_SortCondition, CT_IconFilter, CT_IconSet, CT_CfIcon

A simple type that specifies an **icon set**.

Value	Meaning
3Arrows	
3ArrowsGray	
3Flags	

Value	Meaning
3TrafficLights1	
3TrafficLights2	
3Signs	
3Symbols	
3Symbols2	
4Arrows	
4ArrowsGray	
4RedToBlack	
4Rating	
4TrafficLights	
5Arrows	
5ArrowsGray	
5Rating	
5Quarters	
3Stars	
3Triangles	
5Boxes	
NoIcons	No icon set

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_IconSetType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="3Arrows"/>
    <xsd:enumeration value="3ArrowsGray"/>
    <xsd:enumeration value="3Flags"/>
    <xsd:enumeration value="3TrafficLights1"/>
    <xsd:enumeration value="3TrafficLights2"/>
    <xsd:enumeration value="3Signs"/>
    <xsd:enumeration value="3Symbols"/>
    <xsd:enumeration value="3Symbols2"/>
    <xsd:enumeration value="4Arrows"/>
    <xsd:enumeration value="4ArrowsGray"/>
    <xsd:enumeration value="4RedToBlack"/>
    <xsd:enumeration value="4Rating"/>
    <xsd:enumeration value="4TrafficLights"/>
    <xsd:enumeration value="5Arrows"/>
    <xsd:enumeration value="5ArrowsGray"/>
    <xsd:enumeration value="5Rating"/>
    <xsd:enumeration value="5Quarters"/>
    <xsd:enumeration value="3Stars"/>
    <xsd:enumeration value="3Triangles"/>
    <xsd:enumeration value="5Boxes"/>
    <xsd:enumeration value="NoIcons"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.11 ST_PivotEditValueType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotEditValue

A simple type that specifies the type of the modified value in the PivotTable ([ISO/IEC29500-1:2016] section 18.10) data area using PivotTable what-if analysis.

Value	Meaning
number	Numerical value
dateTime	Date and time value
string	String value
boolean	Boolean value
error	Error value

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_PivotEditValueType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="number"/>
    <xsd:enumeration value="dateTime"/>
    <xsd:enumeration value="string"/>
```

```
      <xsd:enumeration value="boolean"/>
      <xsd:enumeration value="error"/>
    </xsd:restriction>
  </xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.12 ST_AllocationMethod

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_PivotTableDefinition, CT_PivotChange

A simple type that specifies the method of allocation for PivotTable what-if analysis.

Value	Meaning
equalAllocation	Equal allocation
equalIncrement	Equal increment
weightedAllocation	Weighted allocation
weightedIncrement	Weighted increment

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
  <xsd:simpleType name="ST_AllocationMethod">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="equalAllocation"/>
      <xsd:enumeration value="equalIncrement"/>
      <xsd:enumeration value="weightedAllocation"/>
      <xsd:enumeration value="weightedIncrement"/>
    </xsd:restriction>
  </xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.13 ST_SlicerStyleType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_SlicerStyleElement

A simple type that specifies the types of table style ([ISO/IEC29500-1:2016] section 18.8) elements that are specific to slicers. The possible values are listed in the following table.

Value	Meaning
unselectedItemWithData	A slicer item with data that is not **selected**. Used for slicers only.
selectedItemWithData	A selected slicer item with data. Used for slicers only.
unselectedItemWithNoData	A slicer item with no data that is not selected. Used for slicers only.

Value	Meaning
selectedItemWithNoData	A selected slicer item with no data. Used for slicers only.
hoveredUnselectedItemWithData	A slicer item with data that is not selected and over which the mouse is paused on. Used for slicers only.
hoveredSelectedItemWithData	A selected slicer item with data and over which the mouse is paused on. Used for slicers only.
hoveredUnselectedItemWithNoData	A slicer item with no data that is not selected and over which the mouse is paused on. Used for slicers only.
hoveredSelectedItemWithNoData	A selected slicer item with no data and over which the mouse is paused on. Used for slicers only.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_SlicerStyleType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="unselectedItemWithData"/>
    <xsd:enumeration value="selectedItemWithData"/>
    <xsd:enumeration value="unselectedItemWithNoData"/>
    <xsd:enumeration value="selectedItemWithNoData"/>
    <xsd:enumeration value="hoveredUnselectedItemWithData"/>
    <xsd:enumeration value="hoveredSelectedItemWithData"/>
    <xsd:enumeration value="hoveredUnselectedItemWithNoData"/>
    <xsd:enumeration value="hoveredSelectedItemWithNoData"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.14 ST_ObjectType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

A simple type that specifies the types of form control objects. The possible values are included in the following table.

Value	Meaning
Button	Button control
CheckBox	Check-box control
Drop	Drop-down (combo box) control
GBox	Group box control; this control is used for grouping radio button form controls
Label	Label control
List	List box control
Radio	Radio button control

Value	Meaning
Scroll	Scroll bar control
Spin	Spin box control
EditBox	Edit box control
Dialog	Dialog control

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_ObjectType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="Button"/>
    <xsd:enumeration value="CheckBox"/>
    <xsd:enumeration value="Drop"/>
    <xsd:enumeration value="GBox"/>
    <xsd:enumeration value="Label"/>
    <xsd:enumeration value="List"/>
    <xsd:enumeration value="Radio"/>
    <xsd:enumeration value="Scroll"/>
    <xsd:enumeration value="Spin"/>
    <xsd:enumeration value="EditBox"/>
    <xsd:enumeration value="Dialog"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.15 ST_Checked

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

A simple type that specifies if a check box is selected or if the radio button is selected.

Value	Meaning
Unchecked	Object is unchecked or unselected.
Checked	Object is checked or selected.
Mixed	Mixed selection. Applies only to check boxes. The application can determine whether to consider this option as a check box that is not initialized and it is neither selected nor cleared.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_Checked">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="Unchecked"/>
    <xsd:enumeration value="Checked"/>
    <xsd:enumeration value="Mixed"/>
  </xsd:restriction>
```

```
      </xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.16 ST_DropStyle

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

This simple type specifies the style of a drop-down form control. The allowed values are included in the following table.

Value	Meaning
combo	Standard combo box.
comboedit	Editable combo box<25>.
simple	Standard combo box with only the drop-down button visible when the box is not expanded.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_DropStyle">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="combo"/>
    <xsd:enumeration value="comboedit"/>
    <xsd:enumeration value="simple"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.17 ST_SelType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

A simple type that specifies the selection type for the list box form control object. The allowed values are included in the following table.

Value	Meaning
single	Only single selection is allowed.
multi	Multiple selection is allowed. Clicking any item on the list will add it to the selection or, if already selected, will remove it from the selection.
extended	Multiple selection is allowed while the CTRL key is pressed.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_SelType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="single"/>
    <xsd:enumeration value="multi"/>
    <xsd:enumeration value="extended"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.18 ST_EditValidation

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

This simple type specifies the type of validation used for data input to the control. If omitted, the value is assumed to be text. If present, the application can proceed to validate the data accordingly. The valid values are included in the following table.

Value	Meaning
text	Edit box contains text.
integer	Edit box contains an integer.
number	Edit box contains a number.
reference	Edit box contains a cell reference ([ISO/IEC29500-1:2016] section 18.17.2.3).
formula	Edit box contains a spreadsheet formula ([ISO/IEC29500-1:2016] section 18.17).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_EditValidation">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="text"/>
    <xsd:enumeration value="integer"/>
    <xsd:enumeration value="number"/>
    <xsd:enumeration value="reference"/>
    <xsd:enumeration value="formula"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.19 ST_OlapSlicerCacheSortOrder

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_OlapSlicerCacheLevelData

A simple type that specifies how the OLAP slicer items are sorted in the slicer view.

Value	Meaning
natural	The OLAP slicer items are sorted in original order as determined by the **OLAP** slicer source data.
ascending	The OLAP slicer items are sorted in ascending alphabetical order.
descending	The OLAP slicer items are sorted in descending alphabetical order.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_OlapSlicerCacheSortOrder">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="natural"/>
    <xsd:enumeration value="ascending"/>
    <xsd:enumeration value="descending"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.20 ST_TabularSlicerCacheSortOrder

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TableSlicerCache, CT_TabularSlicerCache

A simple type that specifies how the non-OLAP slicer items are sorted in the slicer view.

Value	Meaning
ascending	The non-OLAP slicer items are sorted in ascending alphabetical order.
descending	The non-OLAP slicer items are sorted in descending alphabetical order.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_TabularSlicerCacheSortOrder">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="ascending"/>
    <xsd:enumeration value="descending"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.21 ST_SlicerCacheCrossFilter

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_TableSlicerCache, CT_OlapSlicerCacheLevelData, CT_TabularSlicerCache

A simple type that specifies how the slicer items that are used in slicer cross filtering are displayed.

Value	Meaning
none	The table style ([ISO/IEC29500-1:2016] section 18.8) element of the slicer style for slicer items with no data is not applied to slicer items with no data, and slicer items with no data are not sorted separately in the list of slicer items in the slicer view.
showItemsWithDataAtTop	The table style ([ISO/IEC29500-1:2016] section 18.8) element of the slicer style for slicer items with no data is applied to slicer items with no data, and slicer items with no data are sorted at the bottom in the list of slicer items in the slicer view.
showItemsWithNoData	The table style ([ISO/IEC29500-1:2016] section 18.8) element of the slicer style for slicer items with no data is applied to slicer items with no data, and slicer items with no data are not sorted separately in the list of slicer items in the slicer view.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_SlicerCacheCrossFilter">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="none"/>
    <xsd:enumeration value="showItemsWithDataAtTop"/>
    <xsd:enumeration value="showItemsWithNoData"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.22 ST_TextHAlign

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

A simple type that specifies the vertical text alignment for the object. The valid values are included in the following table.

Value	Meaning
left	Left alignment
center	Center alignment
right	Right alignment
justify	Justify alignment
distributed	Distributed alignment

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_TextHAlign">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="left"/>
    <xsd:enumeration value="center"/>
    <xsd:enumeration value="right"/>
```

```
      <xsd:enumeration value="justify"/>
      <xsd:enumeration value="distributed"/>
    </xsd:restriction>
  </xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.23 ST_TextVAlign

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2009/9/main

Referenced by: CT_FormControlPr

A simple type that specifies the vertical text alignment for the object. The valid values are included in the following table.

Value	Meaning
top	Top alignment
center	Center alignment
bottom	Bottom alignment
justify	Justify alignment
distributed	Distributed alignment

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
  <xsd:simpleType name="ST_TextVAlign">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="top"/>
      <xsd:enumeration value="center"/>
      <xsd:enumeration value="bottom"/>
      <xsd:enumeration value="justify"/>
      <xsd:enumeration value="distributed"/>
    </xsd:restriction>
  </xsd:simpleType>
```

See section 5.4 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.24 ST_TimelineStyleType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_TimelineStyleElement

A simple type that specifies the types of table style ([ISO/IEC29500-1:2016] section 18.8) elements that are specific to Timelines. The possible values are listed in the following table.

Value	Meaning
selectionLabel	Timeline style element that applies to the selection label which is the label that indicates the period that has been selected on the Timeline. Used for Timelines only.

Value	Meaning
timeLevel	Timeline style element that applies to the time level which is the label that indicates the time granularity of the Timeline. Used for Timelines only.
periodLabel1	Timeline style element that applies to the upper **row** of the time block labels. Used for Timelines only.
periodLabel2	Timeline style element that applies to the lower row of the time block labels. Used for Timelines only.
selectedTimeBlock	Timeline style element that applies to the selected time blocks which are the segments on the Timeline that have been selected by the user. Used for Timelines only.
unselectedTimeBlock	Timeline style element that applies to the unselected time blocks which are the segments on the Timeline that have not been selected by the user. Used for Timelines only.
selectedTimeBlockSpace	Timeline style element that applies to the area between any two selected time blocks. Used for Timelines only.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_TimelineStyleType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="selectionLabel"/>
    <xsd:enumeration value="timeLevel"/>
    <xsd:enumeration value="periodLabel1"/>
    <xsd:enumeration value="periodLabel2"/>
    <xsd:enumeration value="selectedTimeBlock"/>
    <xsd:enumeration value="unselectedTimeBlock"/>
    <xsd:enumeration value="selectedTimeBlockSpace"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.25 ST_CalcMemNumberFormat

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_CalculatedMember

An enumeration that specifies the display format for a CT_CalculatedMember.

Value	Meaning
default	Specifies that the number will be displayed using its current format.
number	Specifies that the number will be displayed using a comma as a thousands separator.
percent	Specifies that the number will be displayed as a percentage with two decimal places.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_CalcMemNumberFormat">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="default"/>
    <xsd:enumeration value="number"/>
    <xsd:enumeration value="percent"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.26 ST_SXVCellType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_PivotValueCell

A simple type that specifies the type of a PivotValueCell element of a PivotTable ([ISO/IEC29500-1:2016] section 18.10) that is specified by a pivotTableReference element in the extension of a **workbook**.

Value	Meaning
b	The child element **v** of the CT_PivotValueCell. MUST be interpreted as a **Boolean** value. MUST be true or false.
n	The child element **v** of the CT_PivotValueCell. MUST be interpreted as a numeric value.
e	The child element **v** of the CT_PivotValueCell. MUST be interpreted as an error value. MUST be one of the following: ▪ #DIV/0! ▪ #VALUE! ▪ #NUM! ▪ #N/A ▪ #GETTING_DATA
str	The child element **v** of the CT_PivotValueCell. MUST be interpreted as a string value. The string MUST be less than or equal to 65,535 characters in length.
d	The child element **v** of the CT_PivotValueCell. MUST be interpreted as a **dateTime** ([XMLSCHEMA2/2] section 3.2.7) value.
bl	A blank cell. The child element **v** of the CT_PivotValueCell. MUST NOT have any value.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_SXVCellType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="b"/>
    <xsd:enumeration value="n"/>
    <xsd:enumeration value="e"/>
    <xsd:enumeration value="str"/>
    <xsd:enumeration value="d"/>
    <xsd:enumeration value="bl"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.27 ST_QuestionType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_SurveyQuestion

The **ST_QuestionType** simple type specifies the type of input for the answer to a survey question as specified by the **type** attribute of a **CT_SurveyQuestion** (section 2.6.144).

Value	Meaning
checkBox	Answer is indicated via checkbox.
choice	Answer is selected from a list of choices.
date	Answer in the form of a date.
time	Answer in the form of a time.
multipleLinesOfText	Answer in the form of multiple lines of text.
number	Answer is numerical.
singleLineOfText	Answer in the form of a single line of text.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_QuestionType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="checkBox"/>
    <xsd:enumeration value="choice"/>
    <xsd:enumeration value="date"/>
    <xsd:enumeration value="time"/>
    <xsd:enumeration value="multipleLinesOfText"/>
    <xsd:enumeration value="number"/>
    <xsd:enumeration value="singleLineOfText"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.28 ST_QuestionFormat

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_SurveyQuestion

The **ST_QuestionFormat** simple type specifies the text formatting of the input for the answer to a survey question as specified by the **format** attribute of a **CT_SurveyQuestion** (section 2.6.144).

Value	Meaning
generalDate	Format answer as a date.
longDate	Format answer as a long form date.

Value	Meaning
shortDate	Format answer as a short form date.
longTime	Format answer as a long form time.
shortTime	Format answer as a short form time.
generalNumber	Format answer as a number.
standard	Format answer as a number with thousands separators.
fixed	Format answer as a number with a fixed number of digits after the decimal.
percent	Format answer as a percentage.
currency	Format answer as a currency.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_QuestionFormat">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="generalDate"/>
    <xsd:enumeration value="longDate"/>
    <xsd:enumeration value="shortDate"/>
    <xsd:enumeration value="longTime"/>
    <xsd:enumeration value="shortTime"/>
    <xsd:enumeration value="generalNumber"/>
    <xsd:enumeration value="standard"/>
    <xsd:enumeration value="fixed"/>
    <xsd:enumeration value="percent"/>
    <xsd:enumeration value="currency"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.29 ST_SurveyPosition

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2010/11/main

Referenced by: CT_SurveyElementPr

The **ST_SurveyPosition** simple type specifies the type of positioning of an element in a survey, as specified by the **position** attribute of a **CT_SurveyElementPr** (section 2.6.145). The types correspond to the allowed values for the position property of Cascading Style Sheets 2.1, as defined in [CSS-Level2-2009].

Value	Meaning
absolute	Use absolute positioning.
fixed	Use fixed positioning.
relative	Use relative positioning.
static	Use static positioning.

Value	Meaning
inherit	Use inherit positioning.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST SurveyPosition">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="absolute"/>
    <xsd:enumeration value="fixed"/>
    <xsd:enumeration value="relative"/>
    <xsd:enumeration value="static"/>
    <xsd:enumeration value="inherit"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.3 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.30 ST_ModelTimeGroupingContentType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/11/main

Referenced by: CT_CalculatedTimeColumn

Specifies the grouping content type inside a **calculated column.**

Value	Meaning
years	Years
quarters	Quarters
monthsindex	Months Index
months	Months
daysindex	Days Index
days	Days
hours	Hours
minutes	Minutes
seconds	Seconds

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_ModelTimeGroupingContentType">
  <xsd:restriction base="x:ST_Xstring">
    <xsd:enumeration value="years"/>
    <xsd:enumeration value="quarters"/>
    <xsd:enumeration value="monthsindex"/>
    <xsd:enumeration value="months"/>
    <xsd:enumeration value="daysindex"/>
```

```
            <xsd:enumeration value="days"/>
            <xsd:enumeration value="hours"/>
            <xsd:enumeration value="minutes"/>
            <xsd:enumeration value="seconds"/>
        </xsd:restriction>
    </xsd:simpleType>
```

See section 5.10 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.31 ST_Xrevid

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2014/revision

Referenced by: CT_RevisionPtr

This simple type is used in runtime scenarios for Microsoft Excel, and SHOULD be ignored by all others.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
    <xsd:simpleType name="ST_Xrevid">
        <xsd:restriction base="xsd:unsignedLong"/>
    </xsd:simpleType>
```

See section 5.15 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.32 ST_ArrayValueType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_ArrayValue

This simple type specifies the **data type** of the **rich array** value. The possible values are listed in the following table.

Value	Meaning
d	Indicates rich array value is a real number.
i	Indicates rich array value is an integer.
b	Indicates rich array value is a **Boolean**.
e	Indicates rich array value is an error.
s	Indicates rich array value is text.
r	Indicates rich array value is a **rich value**.
a	Indicates rich array value is a rich array.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
    <xsd:simpleType name="ST_ArrayValueType">
```

```
    <xsd:restriction base="x:ST Xstring">
      <xsd:enumeration value="d"/>
      <xsd:enumeration value="i"/>
      <xsd:enumeration value="b"/>
      <xsd:enumeration value="e"/>
      <xsd:enumeration value="s"/>
      <xsd:enumeration value="r"/>
      <xsd:enumeration value="a"/>
    </xsd:restriction>
  </xsd:simpleType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.33 ST_RichFormatPropertyType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFormatProperty

This simple type specifies the **data type** of the value of the property for the **rich value** format.

Value	Meaning
b	Indicates value of the property for the rich value format is a **Boolean**.
n	Indicates value of the property for the rich value format is a real number.
i	Indicates value of the property for the rich value format is an integer.
s	Indicates value of the property for the rich value format is text.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
    <xsd:simpleType name="ST_RichFormatPropertyType">
      <xsd:restriction base="x:ST Xstring">
        <xsd:enumeration value="b"/>
        <xsd:enumeration value="n"/>
        <xsd:enumeration value="i"/>
        <xsd:enumeration value="s"/>
      </xsd:restriction>
    </xsd:simpleType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.34 ST_RichValueFallbackType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: CT_RichValueFallback

This simple type specifies the **data type** of the value of the fallback for the **rich value**.

Value	Meaning
b	Indicates fallback value is a **Boolean**.

Value	Meaning
n	Indicates fallback value is a real number.
e	Indicates fallback value is an error.
s	Indicates fallback value is text.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_RichValueFallbackType">
  <xsd:restriction base="x:ST Xstring">
    <xsd:enumeration value="b"/>
    <xsd:enumeration value="n"/>
    <xsd:enumeration value="e"/>
    <xsd:enumeration value="s"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.35 ST_RichValueValueType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata

Referenced by: CT_Key

This simple type specifies the **data type** of the value of the **key value pair (KVP)**.

Value	Meaning
d	Indicates value is a real number.
i	Indicates value is an integer.
b	Indicates value is a **Boolean**.
e	Indicates value is an error.
s	Indicates value is text.
r	Indicates value is a **rich value**.
a	Indicates value is a **rich array**.
spb	Indicates value is a **supporting property bag**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST RichValueValueType">
  <xsd:restriction base="x:ST_Xstring">
    <xsd:enumeration value="d"/>
    <xsd:enumeration value="i"/>
    <xsd:enumeration value="b"/>
```

```
        <xsd:enumeration value="e"/>
        <xsd:enumeration value="s"/>
        <xsd:enumeration value="r"/>
        <xsd:enumeration value="a"/>
        <xsd:enumeration value="spb"/>
    </xsd:restriction>
</xsd:simpleType>
```

See section 5.21 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.36 ST_SupportingPropertyBagArrayValueType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBagArrayValue

This simple type specifies the **data type** of a single value in the **supporting property bag array**

Value	Meaning
d	Indicates value is a real number.
i	Indicates value is an integer.
b	Indicates value is a **Boolean**.
s	Indicates value is text.
spb	Indicates value is a **supporting property bag**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST SupportingPropertyBagArrayValueType">
  <xsd:restriction base="x:ST_Xstring">
    <xsd:enumeration value="d"/>
    <xsd:enumeration value="i"/>
    <xsd:enumeration value="b"/>
    <xsd:enumeration value="s"/>
    <xsd:enumeration value="spb"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.37 ST_SupportingPropertyBagValueType

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_SupportingPropertyBagKey

This simple type specifies the **data type** of a value in the **supporting property bag**.

Value	Meaning
d	Indicates value is a real number.

Value	Meaning
i	Indicates value is an integer.
b	Indicates value is a **Boolean**.
s	Indicates value is text.
spb	Indicates value is a supporting property bag.
spba	Indicates value is a **supporting property bag array**.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST SupportingPropertyBagValueType">
  <xsd:restriction base="x:ST_Xstring">
    <xsd:enumeration value="d"/>
    <xsd:enumeration value="i"/>
    <xsd:enumeration value="b"/>
    <xsd:enumeration value="s"/>
    <xsd:enumeration value="spb"/>
    <xsd:enumeration value="spba"/>
  </xsd:restriction>
</xsd:simpleType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

2.7.38 ST_RichFilterKey

Target namespace: http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2

Referenced by: CT_RichFilter, CT_RichDateGroupItem, CT_RichTop10, CT_CustomRichFilter, CT_DynamicRichFilter

This simple type extends **ST_Xstring** ([ISO/IEC29500-1:2016] section 22.9.2.19) and specifies the **rich value key** for which the **filter** is defined. The length of this string MUST be less than or equal to 65,535 characters in length. This simple type MUST conform to one of the following grammars.

Grammar	Example
{ rich-value-key }	"RichFilterKey"
{ ["#" length-of-rich-value-key "#" rich-value-key] }	"#13#RichFilterKey"

- The length-of-rich-value-key MUST be specified with integers and MUST match the count of the characters in the associated rich-value-key.

- The rich-value-key MUST be less than or equal to 255 characters in length.

- If rich-value-key begins with "#" then it MUST use the second grammar.

- The second grammar can be repeated to specify nested rich value keys.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<xsd:simpleType name="ST_RichFilterKey">
  <xsd:restriction base="x:ST_Xstring"/>
</xsd:simpleType>
```

See section 5.20 for the full W3C XML Schema ([XMLSCHEMA1/2] section 2.1).

3 Structure Examples

This section contains examples of some of the most commonly used data structures in Excel Binary File Format files. The examples are meant to be a starting point for an implementer learning the file format. They are not meant to cover all records in the file format.

In the following sections, the schema definition might differ from the processing rules imposed by the application. The XSD in this specification provides a base description of the file format. The text that introduces the XSD 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 application as specified restricts the same elements to being non-empty, not null, and present.

3.1 Slicer

This example shows a slicer attached to a native PivotTable and its associated slicer cache. The PivotTable has the "State" and "City" **fields** added to the **row** area and the "Population" field added to the data area. The slicer is based on the "State" field, and is currently filtering on "Washington".

The following figure shows a possible implementation of the slicer discussed in this example.
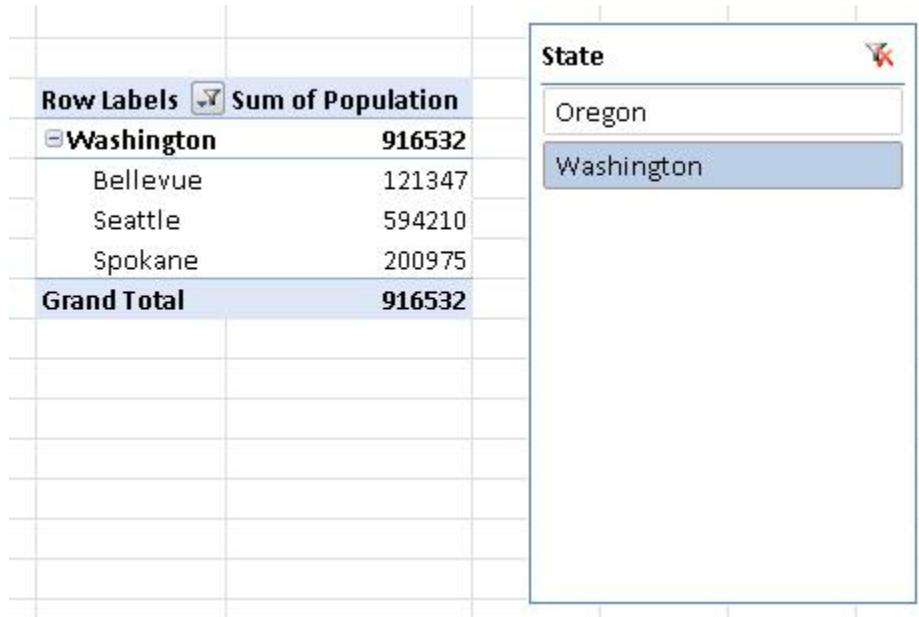
Figure 1: PivotTable and slicer

The following figure shows that the **source data** for the PivotTable that the slicer discussed in this example is filtering, as depicted on a possible implementation of a worksheet.

Figure 2: Source data for the PivotTable

This example includes the entire slicer cache and slicer parts that are used in the specification of a non-**OLAP** slicer.

The `<i>` elements inside the `<items>` element specify the cached non-OLAP slicer items. "Washington" and "Oregon" are the cached non-OLAP slicer items in this example.

3.1.1 Slicer Cache Part

The following is an example slicer cache part, as specified in section 2.1.4.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<slicerCacheDefinition xmlns="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006" mc:Ignorable="x"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main" name="Slicer State"
sourceName="State">
    <pivotTables>
        <pivotTable tabId="1" name="PivotTable1"/>
    </pivotTables>
    <data>
        <tabular pivotCacheId="5">
            <items count="2">
                <i x="1"/>
                <i x="0" s="1"/>
            </items>
        </tabular>
    </data>
</slicerCacheDefinition>
```

The following table describes the **slicerCacheDefinition** element used in this example.

Attribute name	Value	Notes
name	Slicer_State	This is the name of the slicer cache.
sourceName	State	This is the name of the associated slicer, as specified in section 2.1.5.

The following table describes the **pivotTable** element used in this example.

Attribute name	Value	Notes
tabId	1	This indicates that the associated PivotTable, as specified in [ISO/IEC29500-1:2016] section 18.10, is located on the first **sheet**.
name	PivotTable1	This is the name of the associated PivotTable.

The following table describes the **tabular** element used in this example.

Attribute name	Value	Notes
pivotCacheId	5	This indicates that the identifier of the associated PivotTable **PivotCache** is "5".

The following table describes the **items** element used in this example.

Attribute name	Value	Notes
count	2	This indicates that there are two items in the slicer cache.

The following table describes the first i (item) element used in this example.

Attribute name	Value	Notes
x	1	This indicates that the first item in the slicer cache is the second item in the PivotTable **PivotCache**.

The following table describes the second i (item) element used in this example.

Attribute name	Value	Notes
x	0	This indicates that the second item in the slicer cache is the first item in the PivotTable **PivotCache**.
s	1	This indicates that this item is selected in the slicer.

3.1.2 Slicer Part

The following is an example slicer part, as specified in section 2.1.5.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<slicers xmlns="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006" mc:Ignorable="x"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
    <slicer name="State" cache="Slicer_State" caption="State" rowHeight="228600"/>
</slicers>
```

The following table describes the slicer element used in this example.

Attribute name	Value	Notes
name	State	This is the name of the slicer.
cache	Slicer_State	This is the name of the slicer cache, as specified in section 2.1.4.
caption	State	This is the caption displayed at the top of the slicer.
rowHeight	228600	This is the height of a **row** in **EMUs**, equal to one-fourth of an inch.

4 Security Considerations

4.1 Security Considerations for Implementers

The password verifier features available in the file format are used to prevent accidental modification, rather than being used as security features. It is possible to remove the passwords by removing the records containing the verifier values.

The translation of passwords from a double-byte **Unicode** string to a new character string in the ANSI code page of the current system converts any Unicode character that cannot be mapped to the ANSI code page of the current system to the 0x3F character in that code page, as described in [ISO/IEC29500-1:2016] section 18.2.29. Replacing these characters with "0x3F" when the **hash** is verified will generate positive hash value matches. In certain **locales**, this can be a significant portion of the everyday **character set**.

Further security considerations regarding the file encryption algorithms are described in [MS-OFFCRYPTO] section 4.1.3.

4.2 Index of Security Fields

None.

5 Appendix A: Full XML Schema

For ease of implementation, this section provides the full W3C XML schemas for the new elements, attributes, complex types, and simple types specified in the earlier sections. Any schema references to namespaces included in Office Open XML file formats as described in [ISO/IEC29500-1:2016] refer specifically to the transitional schemas as described in [ISO/IEC29500-4:2016].

For ease of implementation, the following sections provide the full XML schema for this protocol.

Schema name	Prefix	Section
http://schemas.microsoft.com/office/excel/2006/main		section 5.1
http://schemas.microsoft.com/office/drawing/2010/slicer		section 5.2
http://schemas.microsoft.com/office/spreadsheetml/2010/11/main		section 5.3
http://schemas.microsoft.com/office/spreadsheetml/2009/9/main		section 5.4
http://schemas.microsoft.com/office/spreadsheetml/2009/9/ac		section 5.5
http://schemas.microsoft.com/office/spreadsheetml/2011/1/ac		section 5.6
http://schemas.microsoft.com/office/drawing/2012/timeslicer		section 5.7
http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing		section 5.8
http://schemas.microsoft.com/office/spreadsheetml/2010/11/ac		section 5.9
http://schemas.microsoft.com/office/spreadsheetml/2014/11/main		section 5.10
http://schemas.microsoft.com/office/spreadsheetml/2015/02/main		section 5.11
http://schemas.microsoft.com/office/spreadsheetml/2016/revision10		section 5.12
http://schemas.microsoft.com/office/spreadsheetml/2016/revision9		section 5.13
http://schemas.microsoft.com/office/spreadsheetml/2016/revision6		section 5.14
http://schemas.microsoft.com/office/spreadsheetml/2014/revision		section 5.15
http://schemas.microsoft.com/office/spreadsheetml/2015/revision2		section 5.16
http://schemas.microsoft.com/office/spreadsheetml/2016/revision3		section 5.17
http://schemas.microsoft.com/office/spreadsheetml/2016/revision5		section 5.18
http://schemas.microsoft.com/office/spreadsheetml/2016/pivotdefaultlayout		section 5.19
http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2		section 5.20
http://schemas.microsoft.com/office/spreadsheetml/2017/richdata		section 5.21
http://schemas.microsoft.com/office/spreadsheetml/2018/calcfeatures		section 5.22
http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments		section 5.23
http://schemas.microsoft.com/office/spreadsheetml/2018/08/main		section 5.24
http://schemas.microsoft.com/office/spreadsheetml/2017/dynamicarray		section 5.25
http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews		section 5.26

Schema name	Prefix	Section
http://schemas.microsoft.com/office/spreadsheetml/2019/extlinksprops		section 5.27
http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage		section 5.28
http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020		section 5.29
http://schemas.microsoft.com/office/spreadsheetml/2020/threadedcomments2		section 5.30
http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh		section 5.31

5.1   http://schemas.microsoft.com/office/excel/2006/main Schema

```
<xsd:schema xmlns="http://schemas.microsoft.com/office/excel/2006/main"
elementFormDefault="qualified"
targetNamespace="http://schemas.microsoft.com/office/excel/2006/main"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:simpleType name="ST_Ref">
    <xsd:restriction base="xsd:string"/>
  </xsd:simpleType>
  <xsd:complexType name="CT_Ref">
    <xsd:simpleContent>
      <xsd:extension base="ST Ref">
        <xsd:attribute name="edited" type="xsd:boolean" use="optional"/>
        <xsd:attribute name="adjusted" type="xsd:boolean" use="optional"/>
        <xsd:attribute name="adjust" type="xsd:boolean" use="optional"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:simpleType name="ST Sqref">
    <xsd:list itemType="ST Ref"/>
  </xsd:simpleType>
  <xsd:complexType name="CT_Sqref">
    <xsd:simpleContent>
      <xsd:extension base="ST Sqref">
        <xsd:attribute name="edited" type="xsd:boolean" use="optional"/>
        <xsd:attribute name="split" type="xsd:boolean" use="optional"/>
        <xsd:attribute name="adjusted" type="xsd:boolean" use="optional"/>
        <xsd:attribute name="adjust" type="xsd:boolean" use="optional"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:element name="f" type="x:ST_Formula"/>
  <xsd:element name="ref" type="CT_Ref"/>
  <xsd:element name="sqref" type="CT_Sqref"/>
</xsd:schema>
```

5.2   http://schemas.microsoft.com/office/drawing/2010/slicer Schema

```
<xsd:schema elementFormDefault="qualified"
targetNamespace="http://schemas.microsoft.com/office/drawing/2010/slicer"
xmlns="http://schemas.microsoft.com/office/drawing/2010/slicer"
xmlns:a="http://schemas.openxmlformats.org/drawingml/2006/main"
xmlns:a14="http://schemas.microsoft.com/office/drawing/2010/main"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import namespace="http://schemas.microsoft.com/office/drawing/2010/main"
schemaLocation="oart14docprop.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/drawingml/2006/main"
schemaLocation="oartdocprop.xsd"/>
```

```
  <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
schemaLocation="orel.xsd"/>
  <xsd:complexType name="CT_Slicer">
    <xsd:sequence>
      <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string" use="required"/>
  </xsd:complexType>
  <xsd:element name="slicer" type="CT_Slicer"/>
</xsd:schema>
```

5.3 http://schemas.microsoft.com/office/spreadsheetml/2010/11/main Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x14="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2010/11/main"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2010/11/main"
elementFormDefault="qualified"
xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
xmlns:xm="http://schemas.microsoft.com/office/excel/2006/main"
xmlns:xr10="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
schemaLocation="xlslicercache.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlworkbook.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/excel/2006/main"
schemaLocation="xlmbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlsheet.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
schemaLocation="orel.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlpivot.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlextconns.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2014/11/main"
schemaLocation="xlpivot16.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10"
schemaLocation="xlrevexignore10.xsd"/>
  <xsd:element name="slicerCaches" type="x14:CT_SlicerCaches"/>
  <xsd:element name="tableSlicerCache" type="CT_TableSlicerCache"/>
  <xsd:complexType name="CT_TableSlicerCache">
    <xsd:sequence>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="tableId" type="xsd:unsignedInt" use="required"/>
    <xsd:attribute name="column" type="xsd:unsignedInt" use="required"/>
    <xsd:attribute name="sortOrder" type="x14:ST_TabularSlicerCacheSortOrder" use="optional"
default="ascending"/>
    <xsd:attribute name="customListSort" type="xsd:boolean" use="optional" default="true"/>
    <xsd:attribute name="crossFilter" type="x14:ST_SlicerCacheCrossFilter" use="optional"
default="showItemsWithDataAtTop"/>
  </xsd:complexType>
  <xsd:element name="slicerCacheHideItemsWithNoData" type="CT_SlicerCacheHideNoData"/>
  <xsd:complexType name="CT_SlicerCacheHideNoData">
    <xsd:sequence>
      <xsd:element name="slicerCacheOlapLevelName" type="CT_SlicerCacheOlapLevelName"
minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
  </xsd:complexType>
  <xsd:complexType name="CT_SlicerCacheOlapLevelName">
    <xsd:attribute name="uniqueName" type="x:ST_Xstring" use="required"/>
```

```
        <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
    <xsd:element name="slicerCachePivotTables" type="x14:CT_SlicerCachePivotTables"/>
    <xsd:element name="pivotCaches" type="x:CT_PivotCaches"/>
    <xsd:element name="pivotTableReferences" type="CT_PivotTableReferences"/>
    <xsd:complexType name="CT_PivotTableReferences">
        <xsd:sequence>
            <xsd:element name="pivotTableReference" type="CT_PivotTableReference" minOccurs="1"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_PivotTableReference">
        <xsd:attribute ref="r:id" use="required"/>
    </xsd:complexType>
    <xsd:element name="queryTable" type="CT_QueryTable"/>
    <xsd:complexType name="CT_QueryTable">
        <xsd:attribute name="clipped" use="optional" default="false" type="xsd:boolean"/>
        <xsd:attribute name="sourceDataName" type="xsd:string" use="optional"/>
        <xsd:attribute name="drillThrough" use="optional" default="false" type="xsd:boolean"/>
    </xsd:complexType>
    <xsd:element name="webExtensions" type="CT_WebExtensions"/>
    <xsd:complexType name="CT_WebExtensions">
        <xsd:sequence>
            <xsd:element name="webExtension" type="CT_WebExtension" minOccurs="1"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_WebExtension">
        <xsd:sequence>
            <xsd:element ref="xm:f" minOccurs="1" maxOccurs="1"/>
        </xsd:sequence>
        <xsd:attribute name="appRef" type="x:ST_Xstring" use="required"/>
    </xsd:complexType>
    <xsd:element name="timelineCacheRefs" type="CT_TimelineCacheRefs"/>
    <xsd:complexType name="CT_TimelineCacheRefs">
        <xsd:sequence>
            <xsd:element name="timelineCacheRef" type="CT_TimelineCacheRef" minOccurs="1"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_TimelineCacheRef">
        <xsd:attribute ref="r:id" use="required"/>
    </xsd:complexType>
    <xsd:element name="timelineRefs" type="CT_TimelineRefs"/>
    <xsd:complexType name="CT_TimelineRefs">
        <xsd:sequence>
            <xsd:element name="timelineRef" type="CT_TimelineRef" minOccurs="1"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_TimelineRef">
        <xsd:attribute ref="r:id" use="required"/>
    </xsd:complexType>
    <xsd:element name="timelineCachePivotCaches" type="x:CT_PivotCaches"/>
    <xsd:complexType name="CT_WorkbookPr">
        <xsd:attribute name="chartTrackingRefBase" type="xsd:boolean" default="false"/>
    </xsd:complexType>
    <xsd:element name="workbookPr" type="CT_WorkbookPr"/>
    <xsd:element name="timelineStyles" type="CT_TimelineStyles"/>
    <xsd:complexType name="CT_TimelineStyles">
        <xsd:sequence>
            <xsd:element name="timelineStyle" type="CT_TimelineStyle" minOccurs="0"
maxOccurs="unbounded"/>
        </xsd:sequence>
        <xsd:attribute name="defaultTimelineStyle" type="xsd:string" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT_TimelineStyleElements">
        <xsd:sequence>
```

```
        <xsd:element name="timelineStyleElement" type="CT TimelineStyleElement" minOccurs="1"
maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_TimelineStyle">
      <xsd:sequence>
        <xsd:element name="timelineStyleElements" type="CT_TimelineStyleElements" minOccurs="0"
maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="name" type="xsd:string" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT_TimelineStyleElement">
      <xsd:attribute name="type" type="ST_TimelineStyleType" use="required"/>
      <xsd:attribute name="dxfId" type="x:ST_DxfId" use="optional"/>
    </xsd:complexType>
    <xsd:simpleType name="ST_TimelineStyleType">
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="selectionLabel"/>
        <xsd:enumeration value="timeLevel"/>
        <xsd:enumeration value="periodLabel1"/>
        <xsd:enumeration value="periodLabel2"/>
        <xsd:enumeration value="selectedTimeBlock"/>
        <xsd:enumeration value="unselectedTimeBlock"/>
        <xsd:enumeration value="selectedTimeBlockSpace"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:element name="dxfs" type="x:CT_Dxfs"/>
    <xsd:element name="connection" type="CT_Connection"/>
    <xsd:complexType name="CT ModelTextPr">
      <xsd:attribute name="headers" type="xsd:boolean" default="false" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT_RangePr">
      <xsd:attribute name="sourceName" use="required" type="x:ST_Xstring"/>
    </xsd:complexType>
    <xsd:complexType name="CT_DbTable">
      <xsd:attribute name="name" use="required" type="x:ST Xstring"/>
    </xsd:complexType>
    <xsd:complexType name="CT_DbTables">
      <xsd:sequence>
        <xsd:element name="dbTable" minOccurs="1" maxOccurs="unbounded" type="CT DbTable"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_DbCommand">
      <xsd:attribute name="text" use="required" type="x:ST_Xstring"/>
    </xsd:complexType>
    <xsd:complexType name="CT OledbPr">
      <xsd:choice minOccurs="1" maxOccurs="1">
        <xsd:element name="dbTables" type="CT DbTables"/>
        <xsd:element name="dbCommand" type="CT_DbCommand"/>
      </xsd:choice>
      <xsd:attribute name="connection" use="optional" type="x:ST_Xstring"/>
    </xsd:complexType>
    <xsd:complexType name="CT_DataFeedPr">
      <xsd:sequence>
        <xsd:element name="dbTables" type="CT_DbTables" minOccurs="1" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="connection" use="required" type="x:ST Xstring"/>
    </xsd:complexType>
    <xsd:complexType name="CT Connection">
      <xsd:sequence>
        <xsd:element name="textPr" minOccurs="0" maxOccurs="1" type="x:CT_TextPr"/>
        <xsd:element name="modelTextPr" minOccurs="0" maxOccurs="1" type="CT_ModelTextPr"/>
        <xsd:element name="rangePr" minOccurs="0" maxOccurs="1" type="CT RangePr"/>
        <xsd:element name="oledbPr" minOccurs="0" maxOccurs="1" type="CT_OledbPr"/>
        <xsd:element name="dataFeedPr" minOccurs="0" maxOccurs="1" type="CT DataFeedPr"/>
      </xsd:sequence>
      <xsd:attribute name="id" use="required" type="x:ST_Xstring"/>
      <xsd:attribute name="model" type="xsd:boolean" default="false" use="optional"/>
```

```
        <xsd:attribute name="excludeFromRefreshAll" type="xsd:boolean" default="false"
use="optional"/>
        <xsd:attribute name="autoDelete" type="xsd:boolean" default="false" use="optional"/>
        <xsd:attribute name="usedByAddin" type="xsd:boolean" default="false" use="optional"/>
      </xsd:complexType>
      <xsd:simpleType name="ST_CalcMemNumberFormat">
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="default"/>
          <xsd:enumeration value="number"/>
          <xsd:enumeration value="percent"/>
        </xsd:restriction>
      </xsd:simpleType>
      <xsd:complexType name="CT_CalculatedMemberExt">
        <xsd:sequence>
          <xsd:element ref="calculatedMember" minOccurs="1" maxOccurs="1"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:element name="calculatedMember" type="CT_CalculatedMember"/>
      <xsd:complexType name="CT_CalculatedMember">
        <xsd:attribute name="measureGroup" type="x:ST_Xstring" use="optional"/>
        <xsd:attribute name="numberFormat" type="ST_CalcMemNumberFormat" use="optional"
default="default"/>
        <xsd:attribute name="measure" type="xsd:boolean" use="optional" default="false"/>
      </xsd:complexType>
      <xsd:element name="pivotTableUISettings" type="CT_PivotTableUISettings"/>
      <xsd:complexType name="CT_PivotTableUISettings">
        <xsd:sequence>
          <xsd:element name="activeTabTopLevelEntity" type="CT_FieldListActiveTabTopLevelEntity"
minOccurs="0" maxOccurs="unbounded"/>
          <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
        </xsd:sequence>
        <xsd:attribute name="sourceDataName" type="xsd:string" use="optional"/>
        <xsd:attribute name="relNeededHidden" type="xsd:boolean" use="optional" default="false"/>
      </xsd:complexType>
      <xsd:complexType name="CT_FieldListActiveTabTopLevelEntity">
        <xsd:attribute name="name" use="required" type="xsd:string"/>
        <xsd:attribute name="type" use="optional" default="0" type="xsd:unsignedInt"/>
      </xsd:complexType>
      <xsd:element name="pivotFilter" type="CT_PivotFilter"/>
      <xsd:complexType name="CT_PivotFilter">
        <xsd:attribute name="useWholeDay" type="xsd:boolean" use="required"/>
      </xsd:complexType>
      <xsd:element name="cachedUniqueNames" type="CT_CachedUniqueNames"/>
      <xsd:complexType name="CT_CachedUniqueNames">
        <xsd:sequence>
          <xsd:element name="cachedUniqueName" minOccurs="1" maxOccurs="unbounded"
type="CT_CachedUniqueName"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:complexType name="CT_CachedUniqueName">
        <xsd:attribute name="index" use="required" type="xsd:unsignedInt"/>
        <xsd:attribute name="name" use="required" type="x:ST_Xstring"/>
      </xsd:complexType>
      <xsd:complexType name="CT_CacheHierarchy">
        <xsd:attribute name="aggregatedColumn" use="required" type="xsd:int"/>
      </xsd:complexType>
      <xsd:element name="cacheHierarchy" type="CT_CacheHierarchy"/>
      <xsd:element name="timelinePivotCacheDefinition" type="CT_TimelinePivotCacheDefinition"/>
      <xsd:complexType name="CT_TimelinePivotCacheDefinition">
        <xsd:attribute name="timelineData" type="xsd:boolean" use="optional" default="false"/>
      </xsd:complexType>
      <xsd:element name="pivotCacheIdVersion" type="CT_PivotCacheIdVersion"/>
      <xsd:complexType name="CT_PivotCacheIdVersion">
        <xsd:attribute name="cacheIdSupportedVersion" type="xsd:unsignedByte" use="required"/>
        <xsd:attribute name="cacheIdCreatedVersion" type="xsd:unsignedByte" use="required"/>
      </xsd:complexType>
      <xsd:complexType name="CT_ModelTable">
        <xsd:attribute name="id" type="x:ST_Xstring" use="required"/>
        <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
```

```
      <xsd:attribute name="connection" type="x:ST Xstring" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_ModelTables">
    <xsd:sequence>
      <xsd:element name="modelTable" minOccurs="1" maxOccurs="unbounded"
type="CT ModelTable"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_ModelRelationship">
    <xsd:attribute name="fromTable" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="fromColumn" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="toTable" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="toColumn" type="x:ST_Xstring" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_ModelRelationships">
    <xsd:sequence>
      <xsd:element name="modelRelationship" minOccurs="1" maxOccurs="unbounded"
type="CT_ModelRelationship"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_DataModel">
    <xsd:sequence>
      <xsd:element name="modelTables" minOccurs="0" maxOccurs="1" type="CT ModelTables"/>
      <xsd:element name="modelRelationships" minOccurs="0" maxOccurs="1"
type="CT_ModelRelationships"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="minVersionLoad" type="xsd:unsignedByte" use="optional" default="5"/>
  </xsd:complexType>
  <xsd:element name="dataModel" type="CT_DataModel"/>
  <xsd:element name="pivotTableData" type="CT PivotTableData"/>
  <xsd:complexType name="CT_PivotTableData">
    <xsd:sequence>
      <xsd:element name="pivotRow" type="CT PivotRow" minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="rowCount" type="xsd:unsignedInt" use="required"/>
    <xsd:attribute name="columnCount" type="xsd:unsignedInt" use="required"/>
    <xsd:attribute name="cacheId" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT PivotRow">
    <xsd:sequence>
      <xsd:element name="c" type="CT PivotValueCell" minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="r" type="xsd:unsignedInt" use="optional"/>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_PivotValueCell">
    <xsd:sequence>
      <xsd:element name="v" type="x:ST_Xstring" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="x" type="CT_PivotValueCellExtra" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="i" type="xsd:unsignedInt" use="optional"/>
    <xsd:attribute name="t" type="ST_SXVCellType" use="optional" default="n"/>
  </xsd:complexType>
  <xsd:complexType name="CT_PivotValueCellExtra">
    <xsd:attribute name="in" type="xsd:unsignedInt" use="optional"/>
    <xsd:attribute name="bc" type="x:ST UnsignedIntHex" use="optional"/>
    <xsd:attribute name="fc" type="x:ST_UnsignedIntHex" use="optional"/>
    <xsd:attribute name="i" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="un" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="st" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="b" type="xsd:boolean" use="optional" default="false"/>
  </xsd:complexType>
  <xsd:simpleType name="ST_SXVCellType">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="b"/>
      <xsd:enumeration value="n"/>
      <xsd:enumeration value="e"/>
      <xsd:enumeration value="str"/>
```

```xsd
        <xsd:enumeration value="d"/>
        <xsd:enumeration value="bl"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:complexType name="CT_PivotTableServerFormats">
      <xsd:sequence>
        <xsd:element name="serverFormat" type="x:CT_ServerFormat" minOccurs="1"
maxOccurs="unbounded"/>
      </xsd:sequence>
      <xsd:attribute name="count" use="required" type="xsd:unsignedInt"/>
    </xsd:complexType>
    <xsd:element name="dataField" type="CT_DataField"/>
    <xsd:complexType name="CT_DataField">
      <xsd:attribute name="isCountDistinct" type="xsd:boolean" use="optional" default="false"/>
    </xsd:complexType>
    <xsd:element name="survey" type="CT_Survey"/>
    <xsd:complexType name="CT_Survey">
      <xsd:sequence>
        <xsd:element name="surveyPr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="titlePr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="descriptionPr" type="CT_SurveyElementPr" minOccurs="0"
maxOccurs="1"/>
        <xsd:element name="questions" type="CT_SurveyQuestions" minOccurs="1" maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
      <xsd:attribute name="guid" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="title" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="description" type="x:ST_Xstring" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT_SurveyQuestions">
      <xsd:sequence>
        <xsd:element name="questionsPr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="question" type="CT_SurveyQuestion" minOccurs="1"
maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_SurveyQuestion">
      <xsd:sequence>
        <xsd:element name="questionPr" type="CT_SurveyElementPr" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="binding" type="xsd:unsignedInt" use="required"/>
      <xsd:attribute name="text" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="type" type="ST_QuestionType" use="optional"/>
      <xsd:attribute name="format" type="ST_QuestionFormat" use="optional"/>
      <xsd:attribute name="helpText" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="required" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="defaultValue" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="decimalPlaces" type="xsd:unsignedInt" use="optional"/>
      <xsd:attribute name="rowSource" type="x:ST_Xstring" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT_SurveyElementPr">
      <xsd:sequence>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="cssClass" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="bottom" type="xsd:int" use="optional"/>
      <xsd:attribute name="top" type="xsd:int" use="optional"/>
      <xsd:attribute name="left" type="xsd:int" use="optional"/>
      <xsd:attribute name="right" type="xsd:int" use="optional"/>
      <xsd:attribute name="width" type="xsd:unsignedInt" use="optional"/>
      <xsd:attribute name="height" type="xsd:unsignedInt" use="optional"/>
      <xsd:attribute name="position" type="ST_SurveyPosition" use="optional"/>
    </xsd:complexType>
    <xsd:simpleType name="ST_QuestionType">
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="checkBox"/>
        <xsd:enumeration value="choice"/>
```

```xsd
            <xsd:enumeration value="date"/>
            <xsd:enumeration value="time"/>
            <xsd:enumeration value="multipleLinesOfText"/>
            <xsd:enumeration value="number"/>
            <xsd:enumeration value="singleLineOfText"/>
        </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType name="ST_QuestionFormat">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="generalDate"/>
            <xsd:enumeration value="longDate"/>
            <xsd:enumeration value="shortDate"/>
            <xsd:enumeration value="longTime"/>
            <xsd:enumeration value="shortTime"/>
            <xsd:enumeration value="generalNumber"/>
            <xsd:enumeration value="standard"/>
            <xsd:enumeration value="fixed"/>
            <xsd:enumeration value="percent"/>
            <xsd:enumeration value="currency"/>
        </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType name="ST_SurveyPosition">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="absolute"/>
            <xsd:enumeration value="fixed"/>
            <xsd:enumeration value="relative"/>
            <xsd:enumeration value="static"/>
            <xsd:enumeration value="inherit"/>
        </xsd:restriction>
    </xsd:simpleType>
    <xsd:element name="timelines" type="CT_Timelines"/>
    <xsd:complexType name="CT_Timelines">
        <xsd:sequence>
            <xsd:element name="timeline" type="CT_Timeline" minOccurs="1" maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_Timeline">
        <xsd:sequence>
            <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
        </xsd:sequence>
        <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
        <xsd:attribute ref="xr10:uid" use="optional"/>
        <xsd:attribute name="cache" type="x:ST_Xstring" use="required"/>
        <xsd:attribute name="caption" type="x:ST_Xstring" use="optional"/>
        <xsd:attribute name="showHeader" type="xsd:boolean" use="optional" default="true"/>
        <xsd:attribute name="showSelectionLabel" type="xsd:boolean" use="optional"
default="true"/>
        <xsd:attribute name="showTimeLevel" type="xsd:boolean" use="optional" default="true"/>
        <xsd:attribute name="showHorizontalScrollbar" type="xsd:boolean" use="optional"
default="true"/>
        <xsd:attribute name="level" type="xsd:unsignedInt" use="required"/>
        <xsd:attribute name="selectionLevel" type="xsd:unsignedInt" use="required"/>
        <xsd:attribute name="scrollPosition" type="xsd:dateTime" use="optional"/>
        <xsd:attribute name="style" type="x:ST_Xstring" use="optional"/>
    </xsd:complexType>
    <xsd:element name="timelineCacheDefinition" type="CT_TimelineCacheDefinition"/>
    <xsd:complexType name="CT_TimelineCacheDefinition">
        <xsd:sequence>
            <xsd:element name="pivotTables" type="CT_TimelineCachePivotTables" minOccurs="0"
maxOccurs="1"/>
            <xsd:element name="state" type="CT_TimelineState" minOccurs="1" maxOccurs="1"/>
            <xsd:element name="timelinePivotFilter" minOccurs="0" maxOccurs="1"
type="CT_TimelinePivotFilter"/>
            <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
        </xsd:sequence>
        <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
        <xsd:attribute ref="xr10:uid" use="optional"/>
        <xsd:attribute name="sourceName" type="x:ST_Xstring" use="required"/>
    </xsd:complexType>
```

```xsd
   <xsd:complexType name="CT TimelineCachePivotTables">
     <xsd:sequence>
       <xsd:element name="pivotTable" type="CT_TimelineCachePivotTable" minOccurs="1"
maxOccurs="unbounded"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_TimelineCachePivotTable">
     <xsd:attribute name="tabId" type="xsd:unsignedInt" use="required"/>
     <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
   </xsd:complexType>
   <xsd:complexType name="CT TimelineRange">
     <xsd:attribute name="startDate" type="xsd:dateTime" use="required"/>
     <xsd:attribute name="endDate" type="xsd:dateTime" use="required"/>
   </xsd:complexType>
   <xsd:complexType name="CT_TimelineState">
     <xsd:sequence>
       <xsd:element name="selection" type="CT TimelineRange" minOccurs="0" maxOccurs="1"/>
       <xsd:element name="bounds" type="CT_TimelineRange" minOccurs="1" maxOccurs="1"/>
       <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
     </xsd:sequence>
     <xsd:attribute name="singleRangeFilterState" type="xsd:boolean" use="optional"
default="true"/>
     <xsd:attribute name="minimalRefreshVersion" type="xsd:unsignedInt" use="required"/>
     <xsd:attribute name="lastRefreshVersion" type="xsd:unsignedInt" use="required"/>
     <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="required"/>
     <xsd:attribute name="filterType" use="required" type="x:ST_PivotFilterType"/>
   </xsd:complexType>
   <xsd:complexType name="CT_TimelinePivotFilter">
     <xsd:sequence>
       <xsd:element name="autoFilter" minOccurs="0" maxOccurs="1" type="x:CT_AutoFilter"/>
     </xsd:sequence>
     <xsd:attribute name="useWholeDay" type="xsd:boolean" use="optional" default="false"/>
     <xsd:attribute name="fld" use="required" type="xsd:unsignedInt"/>
     <xsd:attribute name="id" use="required" type="xsd:unsignedInt"/>
     <xsd:attribute name="name" use="optional" type="x:ST_Xstring"/>
     <xsd:attribute name="description" use="optional" type="x:ST Xstring"/>
   </xsd:complexType>
</xsd:schema>
```

5.4   http://schemas.microsoft.com/office/spreadsheetml/2009/9/main Schema

```xsd
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns:xr10="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
elementFormDefault="qualified" xmlns:xm="http://schemas.microsoft.com/office/excel/2006/main"
xmlns:xr="http://schemas.microsoft.com/office/spreadsheetml/2014/revision"
xmlns:xr2="http://schemas.microsoft.com/office/spreadsheetml/2015/revision2">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlsheet.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
schemaLocation="orel.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2010/11/main"
schemaLocation="xl15.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2010/11/main"
schemaLocation="xlslicercache15.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10"
schemaLocation="xlrevexignore10.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlpivot.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlworkbook.xsd"/>
```

```
    <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlsupbook.xsd"/>
    <xsd:import namespace="http://schemas.microsoft.com/office/excel/2006/main"
schemaLocation="xlmbasictypes.xsd"/>
    <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2014/revision"
schemaLocation="xlrevexignore.xsd"/>
    <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2015/revision2"
schemaLocation="xlrevexignore2.xsd"/>
    <xsd:import schemaLocation="xlsst.xsd"
namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"/>
    <xsd:element name="slicerCacheDefinition" type="CT_SlicerCacheDefinition"/>
    <xsd:complexType name="CT_SlicerCacheDefinition">
        <xsd:sequence>
            <xsd:element name="pivotTables" type="CT_SlicerCachePivotTables" minOccurs="0"
maxOccurs="1"/>
            <xsd:element name="data" type="CT_SlicerCacheData" minOccurs="0" maxOccurs="1"/>
            <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
        </xsd:sequence>
        <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
        <xsd:attribute ref="xr10:uid" use="optional"/>
        <xsd:attribute name="sourceName" type="x:ST_Xstring" use="required"/>
    </xsd:complexType>
    <xsd:simpleType name="ST_OlapSlicerCacheSortOrder">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="natural"/>
            <xsd:enumeration value="ascending"/>
            <xsd:enumeration value="descending"/>
        </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType name="ST_TabularSlicerCacheSortOrder">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="ascending"/>
            <xsd:enumeration value="descending"/>
        </xsd:restriction>
    </xsd:simpleType>
    <xsd:simpleType name="ST_SlicerCacheCrossFilter">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="none"/>
            <xsd:enumeration value="showItemsWithDataAtTop"/>
            <xsd:enumeration value="showItemsWithNoData"/>
        </xsd:restriction>
    </xsd:simpleType>
    <xsd:complexType name="CT_SlicerCacheData">
        <xsd:choice minOccurs="1" maxOccurs="1">
            <xsd:element name="olap" type="CT_OlapSlicerCache" minOccurs="1" maxOccurs="1"/>
            <xsd:element name="tabular" type="CT_TabularSlicerCache" minOccurs="1" maxOccurs="1"/>
        </xsd:choice>
    </xsd:complexType>
    <xsd:complexType name="CT_SlicerCachePivotTables">
        <xsd:sequence>
            <xsd:element name="pivotTable" type="CT_SlicerCachePivotTable" minOccurs="1"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_SlicerCachePivotTable">
        <xsd:attribute name="tabId" type="xsd:unsignedInt" use="required"/>
        <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCacheItem">
        <xsd:sequence>
            <xsd:element name="p" type="CT_OlapSlicerCacheItemParent" minOccurs="0"
maxOccurs="unbounded"/>
        </xsd:sequence>
        <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
        <xsd:attribute name="c" type="x:ST_Xstring" use="optional"/>
        <xsd:attribute name="nd" type="xsd:boolean" use="optional" default="false"/>
    </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCacheItemParent">
        <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
```

```
      </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCacheRange">
      <xsd:sequence>
        <xsd:element name="i" type="CT_OlapSlicerCacheItem" minOccurs="1"
maxOccurs="unbounded"/>
      </xsd:sequence>
      <xsd:attribute name="startItem" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCacheRanges">
      <xsd:sequence>
        <xsd:element name="range" type="CT OlapSlicerCacheRange" minOccurs="0"
maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCacheLevelData">
      <xsd:sequence>
        <xsd:element name="ranges" type="CT OlapSlicerCacheRanges" minOccurs="0"
maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="uniqueName" type="x:ST_Xstring" use="required"/>
      <xsd:attribute name="sourceCaption" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
      <xsd:attribute name="sortOrder" type="ST OlapSlicerCacheSortOrder" use="optional"
default="natural"/>
      <xsd:attribute name="crossFilter" type="ST_SlicerCacheCrossFilter" use="optional"
default="showItemsWithDataAtTop"/>
    </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCacheLevelsData">
      <xsd:sequence>
        <xsd:element name="level" type="CT_OlapSlicerCacheLevelData" minOccurs="1"
maxOccurs="unbounded"/>
      </xsd:sequence>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCache">
      <xsd:sequence>
        <xsd:element name="levels" type="CT_OlapSlicerCacheLevelsData" minOccurs="1"
maxOccurs="1"/>
        <xsd:element name="selections" type="CT_OlapSlicerCacheSelections" minOccurs="1"
maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT_OlapSlicerCacheSelections">
      <xsd:sequence>
        <xsd:element name="selection" type="CT_OlapSlicerCacheSelection" minOccurs="1"
maxOccurs="unbounded"/>
      </xsd:sequence>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT OlapSlicerCacheSelection">
      <xsd:sequence>
        <xsd:element name="p" type="CT OlapSlicerCacheItemParent" minOccurs="0"
maxOccurs="unbounded"/>
      </xsd:sequence>
      <xsd:attribute name="n" type="x:ST Xstring" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT TabularSlicerCache">
      <xsd:sequence>
        <xsd:element name="items" type="CT_TabularSlicerCacheItems" minOccurs="0"
maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="required"/>
      <xsd:attribute name="sortOrder" type="ST_TabularSlicerCacheSortOrder" use="optional"
default="ascending"/>
      <xsd:attribute name="customListSort" type="xsd:boolean" use="optional" default="true"/>
      <xsd:attribute name="showMissing" type="xsd:boolean" use="optional" default="true"/>
```

```
          <xsd:attribute name="crossFilter" type="ST SlicerCacheCrossFilter" use="optional"
default="showItemsWithDataAtTop"/>
   </xsd:complexType>
   <xsd:complexType name="CT_TabularSlicerCacheItems">
     <xsd:sequence>
       <xsd:element name="i" type="CT TabularSlicerCacheItem" minOccurs="1"
maxOccurs="unbounded"/>
     </xsd:sequence>
     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
   </xsd:complexType>
   <xsd:complexType name="CT TabularSlicerCacheItem">
     <xsd:attribute name="x" type="xsd:unsignedInt" use="required"/>
     <xsd:attribute name="s" type="xsd:boolean" use="optional" default="false"/>
     <xsd:attribute name="nd" type="xsd:boolean" use="optional" default="false"/>
   </xsd:complexType>
   <xsd:element name="conditionalFormattings" type="CT_ConditionalFormattings"/>
   <xsd:element name="dataValidations" type="CT DataValidations"/>
   <xsd:element name="sparklineGroups" type="CT_SparklineGroups"/>
   <xsd:element name="slicerList" type="CT SlicerRefs"/>
   <xsd:element name="protectedRanges" type="CT_ProtectedRanges"/>
   <xsd:element name="ignoredErrors" type="CT_IgnoredErrors"/>
   <xsd:complexType name="CT_ConditionalFormattings">
     <xsd:sequence>
       <xsd:element name="conditionalFormatting" type="CT_ConditionalFormatting" minOccurs="1"
maxOccurs="unbounded"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_ConditionalFormatting">
     <xsd:sequence>
       <xsd:element name="cfRule" type="CT_CfRule" minOccurs="0" maxOccurs="unbounded"/>
       <xsd:element ref="xm:sqref" minOccurs="0" maxOccurs="1"/>
       <xsd:element name="extLst" minOccurs="0" type="x:CT_ExtensionList"/>
     </xsd:sequence>
     <xsd:attribute name="pivot" type="xsd:boolean" default="false" use="optional"/>
   </xsd:complexType>
   <xsd:complexType name="CT DataValidations">
     <xsd:sequence>
       <xsd:element name="dataValidation" type="CT_DataValidation" minOccurs="1"
maxOccurs="unbounded"/>
     </xsd:sequence>
     <xsd:attribute name="disablePrompts" type="xsd:boolean" use="optional" default="false"/>
     <xsd:attribute name="xWindow" type="xsd:unsignedInt" use="optional"/>
     <xsd:attribute name="yWindow" type="xsd:unsignedInt" use="optional"/>
     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
   </xsd:complexType>
   <xsd:complexType name="CT DataValidationFormula">
     <xsd:sequence>
       <xsd:element ref="xm:f" minOccurs="1" maxOccurs="1"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_DataValidation">
     <xsd:sequence>
       <xsd:element name="formula1" type="CT_DataValidationFormula" minOccurs="0"
maxOccurs="1"/>
       <xsd:element name="formula2" type="CT_DataValidationFormula" minOccurs="0"
maxOccurs="1"/>
       <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
     </xsd:sequence>
     <xsd:attribute name="type" type="x:ST DataValidationType" use="optional" default="none"/>
     <xsd:attribute name="errorStyle" type="x:ST_DataValidationErrorStyle" use="optional"
default="stop"/>
     <xsd:attribute name="imeMode" type="x:ST_DataValidationImeMode" use="optional"
default="noControl"/>
     <xsd:attribute name="operator" type="x:ST_DataValidationOperator" use="optional"
default="between"/>
     <xsd:attribute name="allowBlank" type="xsd:boolean" use="optional" default="false"/>
     <xsd:attribute name="showDropDown" type="xsd:boolean" use="optional" default="false"/>
     <xsd:attribute name="showInputMessage" type="xsd:boolean" use="optional"
default="false"/>
```

```
    <xsd:attribute name="showErrorMessage" type="xsd:boolean" use="optional"
default="false"/>
    <xsd:attribute name="errorTitle" type="x:ST_Xstring" use="optional"/>
    <xsd:attribute name="error" type="x:ST_Xstring" use="optional"/>
    <xsd:attribute name="promptTitle" type="x:ST_Xstring" use="optional"/>
    <xsd:attribute name="prompt" type="x:ST_Xstring" use="optional"/>
    <xsd:attribute ref="xr:uid"/>
  </xsd:complexType>
  <xsd:simpleType name="ST_DispBlanksAs">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="span"/>
      <xsd:enumeration value="gap"/>
      <xsd:enumeration value="zero"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:simpleType name="ST_SparklineAxisMinMax">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="individual"/>
      <xsd:enumeration value="group"/>
      <xsd:enumeration value="custom"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:complexType name="CT_SparklineGroups">
    <xsd:sequence>
      <xsd:element name="sparklineGroup" type="CT_SparklineGroup" minOccurs="1"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_SparklineGroup">
    <xsd:sequence>
      <xsd:element name="colorSeries" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element name="colorNegative" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element name="colorAxis" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element name="colorMarkers" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element name="colorFirst" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element name="colorLast" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element name="colorHigh" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element name="colorLow" minOccurs="0" maxOccurs="1" type="x:CT_Color"/>
      <xsd:element ref="xm:f" minOccurs="0" maxOccurs="1"/>
      <xsd:element name="sparklines" type="CT_Sparklines" minOccurs="1" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="manualMax" type="xsd:double" use="optional"/>
    <xsd:attribute name="manualMin" type="xsd:double" use="optional"/>
    <xsd:attribute name="lineWeight" type="xsd:double" use="optional" default="0.75"/>
    <xsd:attribute name="type" type="ST_SparklineType" use="optional" default="line"/>
    <xsd:attribute name="dateAxis" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="displayEmptyCellsAs" type="ST_DispBlanksAs" use="optional"
default="zero"/>
    <xsd:attribute name="markers" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="high" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="low" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="first" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="last" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="negative" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="displayXAxis" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="displayHidden" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="minAxisType" type="ST_SparklineAxisMinMax" use="optional"
default="individual"/>
    <xsd:attribute name="maxAxisType" type="ST_SparklineAxisMinMax" use="optional"
default="individual"/>
    <xsd:attribute name="rightToLeft" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute ref="xr2:uid"/>
  </xsd:complexType>
  <xsd:simpleType name="ST_SparklineType">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="line"/>
      <xsd:enumeration value="column"/>
      <xsd:enumeration value="stacked"/>
    </xsd:restriction>
```

```xml
      </xsd:simpleType>
      <xsd:complexType name="CT_Sparklines">
        <xsd:sequence>
          <xsd:element name="sparkline" type="CT_Sparkline" minOccurs="1" maxOccurs="unbounded"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:complexType name="CT_Sparkline">
        <xsd:sequence>
          <xsd:element ref="xm:f" minOccurs="0" maxOccurs="1"/>
          <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:element name="pivotCaches" type="x:CT_PivotCaches"/>
      <xsd:element name="slicerCaches" type="CT_SlicerCaches"/>
      <xsd:element name="workbookPr" type="CT_WorkbookPr"/>
      <xsd:complexType name="CT_WorkbookPr">
        <xsd:attribute name="defaultImageDpi" type="xsd:unsignedInt" default="220"/>
        <xsd:attribute name="discardImageEditData" type="xsd:boolean" default="false"/>
        <xsd:attribute name="accuracyVersion" type="xsd:unsignedInt" default="0"/>
      </xsd:complexType>
      <xsd:complexType name="CT_SlicerRefs">
        <xsd:sequence>
          <xsd:element name="slicer" type="CT_SlicerRef" minOccurs="1" maxOccurs="unbounded"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:complexType name="CT_SlicerRef">
        <xsd:attribute ref="r:id" use="required"/>
      </xsd:complexType>
      <xsd:complexType name="CT_SlicerCaches">
        <xsd:sequence>
          <xsd:element name="slicerCache" type="CT_SlicerCache" minOccurs="1"
  maxOccurs="unbounded"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:complexType name="CT_SlicerCache">
        <xsd:attribute ref="r:id" use="required"/>
      </xsd:complexType>
      <xsd:element name="calculatedMember" type="CT_CalculatedMember"/>
      <xsd:complexType name="CT_CalculatedMember">
        <xsd:sequence>
          <xsd:element name="tupleSet" minOccurs="0" maxOccurs="1" type="CT_TupleSet"/>
        </xsd:sequence>
        <xsd:attribute name="displayFolder" type="x:ST_Xstring" use="optional"/>
        <xsd:attribute name="flattenHierarchies" type="xsd:boolean" use="optional"
  default="true"/>
        <xsd:attribute name="dynamicSet" type="xsd:boolean" use="optional" default="false"/>
        <xsd:attribute name="hierarchizeDistinct" type="xsd:boolean" use="optional"
  default="true"/>
        <xsd:attribute name="mdxLong" type="x:ST_Xstring" use="optional"/>
      </xsd:complexType>
      <xsd:complexType name="CT_TupleSet">
        <xsd:sequence>
          <xsd:element name="headers" type="CT_TupleSetHeaders" minOccurs="1" maxOccurs="1"/>
          <xsd:element name="rows" type="CT_TupleSetRows" minOccurs="1" maxOccurs="1"/>
        </xsd:sequence>
        <xsd:attribute name="rowCount" type="xsd:unsignedInt" use="optional" default="1"/>
        <xsd:attribute name="columnCount" type="xsd:unsignedInt" use="optional" default="1"/>
      </xsd:complexType>
      <xsd:complexType name="CT_TupleSetHeaders">
        <xsd:sequence>
          <xsd:element name="header" type="CT_TupleSetHeader" minOccurs="1"
  maxOccurs="unbounded"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:complexType name="CT_TupleSetHeader">
        <xsd:attribute name="uniqueName" type="x:ST_Xstring" use="optional"/>
        <xsd:attribute name="hierarchyName" type="x:ST_Xstring" use="optional"/>
      </xsd:complexType>
      <xsd:complexType name="CT_TupleSetRows">
```

```
<xsd:sequence>
  <xsd:element name="row" type="CT_TupleSetRow" minOccurs="1" maxOccurs="unbounded"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT_TupleSetRow">
  <xsd:sequence>
    <xsd:element name="rowItem" type="CT_TupleSetRowItem" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT TupleSetRowItem">
  <xsd:attribute name="u" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="d" type="x:ST_Xstring" use="optional"/>
</xsd:complexType>
<xsd:element name="cacheHierarchy" type="CT_CacheHierarchy"/>
<xsd:complexType name="CT_SetLevels">
  <xsd:sequence>
    <xsd:element name="setLevel" minOccurs="1" maxOccurs="unbounded" type="CT_SetLevel"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
<xsd:complexType name="CT_SetLevel">
  <xsd:attribute name="hierarchy" use="required" type="xsd:int"/>
</xsd:complexType>
<xsd:complexType name="CT_CacheHierarchy">
  <xsd:sequence>
    <xsd:element name="setLevels" minOccurs="0" maxOccurs="1" type="CT_SetLevels"/>
  </xsd:sequence>
  <xsd:attribute name="flattenHierarchies" type="xsd:boolean" use="optional"
default="true"/>
  <xsd:attribute name="measuresSet" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="hierarchizeDistinct" type="xsd:boolean" use="optional"
default="true"/>
  <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
</xsd:complexType>
<xsd:element name="dataField" type="CT DataField"/>
<xsd:complexType name="CT_DataField">
  <xsd:attribute name="pivotShowAs" type="ST_PivotShowAs" use="optional"/>
  <xsd:attribute name="sourceField" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="uniqueName" type="x:ST Xstring" use="optional"/>
</xsd:complexType>
<xsd:simpleType name="ST PivotShowAs">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="percentOfParent"/>
    <xsd:enumeration value="percentOfParentRow"/>
    <xsd:enumeration value="percentOfParentCol"/>
    <xsd:enumeration value="percentOfRunningTotal"/>
    <xsd:enumeration value="rankAscending"/>
    <xsd:enumeration value="rankDescending"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="ST DataBarDirection">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="context"/>
    <xsd:enumeration value="leftToRight"/>
    <xsd:enumeration value="rightToLeft"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="ST DataBarAxisPosition">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="automatic"/>
    <xsd:enumeration value="middle"/>
    <xsd:enumeration value="none"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="ST_CfvoType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="num"/>
    <xsd:enumeration value="percent"/>
```

```
        <xsd:enumeration value="max"/>
        <xsd:enumeration value="min"/>
        <xsd:enumeration value="formula"/>
        <xsd:enumeration value="percentile"/>
        <xsd:enumeration value="autoMin"/>
        <xsd:enumeration value="autoMax"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:complexType name="CT_Cfvo">
      <xsd:sequence>
        <xsd:element ref="xm:f" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="type" type="ST_CfvoType" use="required"/>
      <xsd:attribute name="gte" type="xsd:boolean" use="optional" default="true"/>
    </xsd:complexType>
    <xsd:complexType name="CT_CfRule">
      <xsd:sequence>
        <xsd:element ref="xm:f" minOccurs="0" maxOccurs="3"/>
        <xsd:element name="colorScale" type="CT_ColorScale" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="dataBar" type="CT_DataBar" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="iconSet" type="CT_IconSet" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="dxf" type="x:CT_Dxf" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="type" type="x:ST_CfType" use="optional"/>
      <xsd:attribute name="priority" type="xsd:int" use="optional"/>
      <xsd:attribute name="stopIfTrue" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="aboveAverage" type="xsd:boolean" use="optional" default="true"/>
      <xsd:attribute name="percent" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="bottom" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="operator" type="x:ST_ConditionalFormattingOperator" use="optional"/>
      <xsd:attribute name="text" type="xsd:string" use="optional"/>
      <xsd:attribute name="timePeriod" type="x:ST_TimePeriod" use="optional"/>
      <xsd:attribute name="rank" type="xsd:unsignedInt" use="optional"/>
      <xsd:attribute name="stdDev" type="xsd:int" use="optional"/>
      <xsd:attribute name="equalAverage" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="activePresent" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="id" type="x:ST_Guid" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT_IconSet">
      <xsd:sequence>
        <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="unbounded"/>
        <xsd:element name="cfIcon" type="CT_CfIcon" minOccurs="0" maxOccurs="5"/>
      </xsd:sequence>
      <xsd:attribute name="iconSet" type="ST_IconSetType" use="optional"
default="3TrafficLights1"/>
      <xsd:attribute name="showValue" type="xsd:boolean" use="optional" default="true"/>
      <xsd:attribute name="percent" type="xsd:boolean" use="optional" default="true"/>
      <xsd:attribute name="reverse" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="custom" type="xsd:boolean" use="optional" default="false"/>
    </xsd:complexType>
    <xsd:complexType name="CT_ColorScale">
      <xsd:sequence>
        <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="unbounded"/>
        <xsd:element name="color" type="x:CT_Color" minOccurs="2" maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_DataBar">
      <xsd:sequence>
        <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="2"/>
        <xsd:element name="fillColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="borderColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="negativeFillColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="negativeBorderColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="axisColor" type="x:CT_Color" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="minLength" type="xsd:unsignedInt" use="optional" default="10"/>
      <xsd:attribute name="maxLength" type="xsd:unsignedInt" use="optional" default="90"/>
```

```xsd
      <xsd:attribute name="showValue" type="xsd:boolean" use="optional" default="true"/>
      <xsd:attribute name="border" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="gradient" type="xsd:boolean" use="optional" default="true"/>
      <xsd:attribute name="direction" type="ST_DataBarDirection" use="optional"
default="context"/>
      <xsd:attribute name="negativeBarColorSameAsPositive" type="xsd:boolean" use="optional"
default="false"/>
      <xsd:attribute name="negativeBarBorderColorSameAsPositive" type="xsd:boolean"
use="optional" default="true"/>
      <xsd:attribute name="axisPosition" type="ST_DataBarAxisPosition" use="optional"
default="automatic"/>
    </xsd:complexType>
    <xsd:element name="pivotField" type="CT_PivotField"/>
    <xsd:complexType name="CT_PivotField">
      <xsd:attribute name="fillDownLabels" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
    </xsd:complexType>
    <xsd:element name="pivotTableDefinition" type="CT_PivotTableDefinition"/>
    <xsd:complexType name="CT_PivotTableDefinition">
      <xsd:sequence>
        <xsd:element name="pivotEdits" type="CT_PivotEdits" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="pivotChanges" type="CT_PivotChanges" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="conditionalFormats" type="CT_ConditionalFormats" minOccurs="0"/>
      </xsd:sequence>
      <xsd:attribute name="fillDownLabelsDefault" type="xsd:boolean" use="optional"
default="false"/>
      <xsd:attribute name="visualTotalsForSets" type="xsd:boolean" use="optional"
default="false"/>
      <xsd:attribute name="calculatedMembersInFilters" type="xsd:boolean" use="optional"
default="false"/>
      <xsd:attribute name="altText" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="altTextSummary" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="enableEdit" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="autoApply" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="allocationMethod" type="ST_AllocationMethod" use="optional"
default="equalAllocation"/>
      <xsd:attribute name="weightExpression" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="hideValuesRow" type="xsd:boolean" use="optional" default="false"/>
    </xsd:complexType>
    <xsd:element name="pivotCacheDefinition" type="CT_PivotCacheDefinition"/>
    <xsd:complexType name="CT_PivotCacheDefinition">
      <xsd:attribute name="slicerData" type="xsd:boolean" use="optional" default="false"/>
      <xsd:attribute name="pivotCacheId" type="xsd:unsignedInt" use="optional"/>
      <xsd:attribute name="supportSubqueryNonVisual" type="xsd:boolean" use="optional"
default="false"/>
      <xsd:attribute name="supportSubqueryCalcMem" type="xsd:boolean" use="optional"
default="false"/>
      <xsd:attribute name="supportAddCalcMems" type="xsd:boolean" use="optional"
default="false"/>
    </xsd:complexType>
    <xsd:element name="connection" type="CT_Connection"/>
    <xsd:complexType name="CT_Connection">
      <xsd:sequence>
        <xsd:element name="calculatedMembers" type="x:CT_CalculatedMembers" minOccurs="0"
maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="culture" use="optional" type="x:ST_Xstring"/>
      <xsd:attribute name="embeddedDataId" use="optional" type="x:ST_Xstring"/>
    </xsd:complexType>
    <xsd:element name="table" type="CT_Table"/>
    <xsd:complexType name="CT_Table">
      <xsd:attribute name="altText" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="altTextSummary" type="x:ST_Xstring" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT_CfIcon">
      <xsd:attribute name="iconSet" type="ST_IconSetType" use="required"/>
      <xsd:attribute name="iconId" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
    <xsd:simpleType name="ST_IconSetType">
```

```xsd
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="3Arrows"/>
        <xsd:enumeration value="3ArrowsGray"/>
        <xsd:enumeration value="3Flags"/>
        <xsd:enumeration value="3TrafficLights1"/>
        <xsd:enumeration value="3TrafficLights2"/>
        <xsd:enumeration value="3Signs"/>
        <xsd:enumeration value="3Symbols"/>
        <xsd:enumeration value="3Symbols2"/>
        <xsd:enumeration value="4Arrows"/>
        <xsd:enumeration value="4ArrowsGray"/>
        <xsd:enumeration value="4RedToBlack"/>
        <xsd:enumeration value="4Rating"/>
        <xsd:enumeration value="4TrafficLights"/>
        <xsd:enumeration value="5Arrows"/>
        <xsd:enumeration value="5ArrowsGray"/>
        <xsd:enumeration value="5Rating"/>
        <xsd:enumeration value="5Quarters"/>
        <xsd:enumeration value="3Stars"/>
        <xsd:enumeration value="3Triangles"/>
        <xsd:enumeration value="5Boxes"/>
        <xsd:enumeration value="NoIcons"/>
      </xsd:restriction>
  </xsd:simpleType>
  <xsd:complexType name="CT_PivotEdits">
    <xsd:sequence>
      <xsd:element name="pivotEdit" minOccurs="1" maxOccurs="unbounded" type="CT_PivotEdit"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_PivotEdit">
    <xsd:sequence>
      <xsd:element name="userEdit" type="CT_PivotUserEdit" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="tupleItems" type="CT_TupleItems" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="pivotArea" type="x:CT_PivotArea" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_PivotChanges">
    <xsd:sequence>
      <xsd:element name="pivotChange" minOccurs="1" maxOccurs="unbounded"
type="CT_PivotChange"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_PivotChange">
    <xsd:sequence>
      <xsd:element name="editValue" type="CT_PivotEditValue" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="tupleItems" type="CT_TupleItems" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="allocationMethod" type="ST_AllocationMethod"
default="equalAllocation"/>
    <xsd:attribute name="weightExpression" type="x:ST_Xstring" use="optional"/>
  </xsd:complexType>
  <xsd:complexType name="CT_PivotUserEdit">
    <xsd:choice minOccurs="1" maxOccurs="1">
      <xsd:element ref="xm:f" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="editValue" type="CT_PivotEditValue" minOccurs="1" maxOccurs="1"/>
    </xsd:choice>
  </xsd:complexType>
  <xsd:complexType name="CT_PivotEditValue">
    <xsd:simpleContent>
      <xsd:extension base="x:ST_Xstring">
        <xsd:attribute name="valueType" use="required" type="ST_PivotEditValueType"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:simpleType name="ST_PivotEditValueType">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="number"/>
```

```xml
      <xsd:enumeration value="dateTime"/>
      <xsd:enumeration value="string"/>
      <xsd:enumeration value="boolean"/>
      <xsd:enumeration value="error"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:complexType name="CT_TupleItems">
    <xsd:sequence>
      <xsd:element name="tupleItem" type="x:ST_Xstring" minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:simpleType name="ST_AllocationMethod">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="equalAllocation"/>
      <xsd:enumeration value="equalIncrement"/>
      <xsd:enumeration value="weightedAllocation"/>
      <xsd:enumeration value="weightedIncrement"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:complexType name="CT_SlicerStyle">
    <xsd:sequence>
      <xsd:element name="slicerStyleElements" type="CT_SlicerStyleElements" minOccurs="0"
maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_SlicerStyleElement">
    <xsd:attribute name="type" type="ST_SlicerStyleType" use="required"/>
    <xsd:attribute name="dxfId" type="x:ST_DxfId" use="optional"/>
  </xsd:complexType>
  <xsd:simpleType name="ST_SlicerStyleType">
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="unselectedItemWithData"/>
      <xsd:enumeration value="selectedItemWithData"/>
      <xsd:enumeration value="unselectedItemWithNoData"/>
      <xsd:enumeration value="selectedItemWithNoData"/>
      <xsd:enumeration value="hoveredUnselectedItemWithData"/>
      <xsd:enumeration value="hoveredSelectedItemWithData"/>
      <xsd:enumeration value="hoveredUnselectedItemWithNoData"/>
      <xsd:enumeration value="hoveredSelectedItemWithNoData"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:element name="slicerStyles" type="CT_SlicerStyles"/>
  <xsd:element name="dxfs" type="x:CT_Dxfs"/>
  <xsd:complexType name="CT_OleItem">
    <xsd:sequence>
      <xsd:element name="values" type="x:CT_DdeValues" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="icon" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="advise" type="xsd:boolean" use="optional" default="false"/>
    <xsd:attribute name="preferPic" type="xsd:boolean" use="optional" default="false"/>
  </xsd:complexType>
  <xsd:element name="oleItem" type="CT_OleItem"/>
  <xsd:element name="pivotHierarchy" type="CT_PivotHierarchy"/>
  <xsd:complexType name="CT_PivotHierarchy">
    <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
  </xsd:complexType>
  <xsd:element name="cacheField" type="CT_CacheField"/>
  <xsd:complexType name="CT_CacheField">
    <xsd:attribute name="ignore" type="xsd:boolean" default="false" use="optional"/>
  </xsd:complexType>
  <xsd:complexType name="CT_ConditionalFormats">
    <xsd:sequence>
      <xsd:element name="conditionalFormat" minOccurs="1" maxOccurs="unbounded"
type="CT_ConditionalFormat"/>
    </xsd:sequence>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
  </xsd:complexType>
```

```xsd
<xsd:complexType name="CT ConditionalFormat">
  <xsd:sequence>
    <xsd:element name="pivotAreas" type="x:CT_PivotAreas" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="x:CT_ExtensionList"/>
  </xsd:sequence>
  <xsd:attribute name="scope" type="x:ST Scope" default="selection" use="optional"/>
  <xsd:attribute name="type" type="x:ST_Type" default="none" use="optional"/>
  <xsd:attribute name="priority" use="optional" type="xsd:unsignedInt"/>
  <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
</xsd:complexType>
<xsd:complexType name="CT SlicerStyles">
  <xsd:sequence>
    <xsd:element name="slicerStyle" type="CT_SlicerStyle" minOccurs="0"
maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="defaultSlicerStyle" type="xsd:string" use="required"/>
</xsd:complexType>
<xsd:complexType name="CT_SlicerStyleElements">
  <xsd:sequence>
    <xsd:element name="slicerStyleElement" type="CT_SlicerStyleElement" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="id" type="x:ST_Guid"/>
<xsd:complexType name="CT_IgnoredErrors">
  <xsd:sequence>
    <xsd:element name="ignoredError" type="CT_IgnoredError" minOccurs="0"
maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT_IgnoredError">
  <xsd:sequence>
    <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="evalError" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="twoDigitTextYear" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="numberStoredAsText" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="formula" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="formulaRange" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="unlockedFormula" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="emptyCellReference" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="listDataValidation" type="xsd:boolean" use="optional"
default="false"/>
  <xsd:attribute name="calculatedColumn" type="xsd:boolean" use="optional"
default="false"/>
</xsd:complexType>
<xsd:complexType name="CT_ProtectedRanges">
  <xsd:sequence>
    <xsd:element name="protectedRange" type="CT_ProtectedRange" minOccurs="1"
maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT ProtectedRange">
  <xsd:sequence maxOccurs="1">
    <xsd:element ref="xm:sqref" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="password" type="x:ST_UnsignedShortHex" use="optional"/>
  <xsd:attribute name="algorithmName" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
  <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
  <xsd:attribute name="spinCount" type="xsd:unsignedInt" use="optional"/>
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="securityDescriptor" type="xsd:string" use="optional"/>
</xsd:complexType>
<xsd:element name="iconFilter" type="CT_IconFilter"/>
```

```
<xsd:complexType name="CT IconFilter">
  <xsd:attribute name="iconSet" type="ST_IconSetType" use="required"/>
  <xsd:attribute name="iconId" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
<xsd:element name="filter" type="CT_Filter"/>
<xsd:complexType name="CT Filter">
  <xsd:attribute name="val" type="x:ST_Xstring"/>
</xsd:complexType>
<xsd:element name="customFilters" type="CT_CustomFilters"/>
<xsd:complexType name="CT_CustomFilters">
  <xsd:sequence>
    <xsd:element name="customFilter" type="CT_CustomFilter" minOccurs="1" maxOccurs="2"/>
  </xsd:sequence>
  <xsd:attribute name="and" type="xsd:boolean" use="optional" default="false"/>
</xsd:complexType>
<xsd:complexType name="CT_CustomFilter">
  <xsd:attribute name="operator" type="x:ST FilterOperator" default="equal"
use="optional"/>
  <xsd:attribute name="val" type="x:ST Xstring"/>
</xsd:complexType>
<xsd:complexType name="CT_SortCondition">
  <xsd:attribute name="descending" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="sortBy" type="x:ST SortBy" use="optional" default="value"/>
  <xsd:attribute name="ref" type="x:ST_Ref" use="required"/>
  <xsd:attribute name="customList" type="x:ST_Xstring" use="optional"/>
  <xsd:attribute name="dxfId" type="x:ST_DxfId" use="optional"/>
  <xsd:attribute name="iconSet" type="ST_IconSetType" use="optional" default="3Arrows"/>
  <xsd:attribute name="iconId" type="xsd:unsignedInt" use="optional"/>
</xsd:complexType>
<xsd:element name="sortCondition" type="CT_SortCondition"/>
<xsd:complexType name="CT CacheSourceExt">
  <xsd:sequence>
    <xsd:element ref="sourceConnection" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="sourceConnection" type="CT SourceConnection"/>
<xsd:complexType name="CT_SourceConnection">
  <xsd:attribute name="name" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
<xsd:element name="datastoreItem" type="CT DatastoreItem"/>
<xsd:complexType name="CT_DatastoreItem">
  <xsd:sequence>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="id" type="x:ST_Xstring" use="required"/>
</xsd:complexType>
<xsd:element name="formControlPr" type="CT_FormControlPr"/>
<xsd:complexType name="CT ListItem">
  <xsd:attribute name="val" type="xsd:string" use="required"/>
</xsd:complexType>
<xsd:complexType name="CT_ListItems">
  <xsd:sequence>
    <xsd:element name="item" type="CT_ListItem" minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT FormControlPr">
  <xsd:sequence>
    <xsd:element name="itemLst" type="CT ListItems" minOccurs="0" maxOccurs="1"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="objectType" type="ST_ObjectType" use="optional"/>
  <xsd:attribute name="checked" type="ST Checked" use="optional"/>
  <xsd:attribute name="colored" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="dropLines" type="xsd:unsignedInt" use="optional" default="8"/>
  <xsd:attribute name="dropStyle" type="ST_DropStyle" use="optional"/>
  <xsd:attribute name="dx" type="xsd:unsignedInt" use="optional" default="80"/>
  <xsd:attribute name="firstButton" type="xsd:boolean" use="optional" default="false"/>
  <xsd:attribute name="fmlaGroup" type="x:ST_Formula" use="optional"/>
```

```
              <xsd:attribute name="fmlaLink" type="x:ST Formula" use="optional"/>
              <xsd:attribute name="fmlaRange" type="x:ST_Formula" use="optional"/>
              <xsd:attribute name="fmlaTxbx" type="x:ST_Formula" use="optional"/>
              <xsd:attribute name="horiz" type="xsd:boolean" use="optional" default="false"/>
              <xsd:attribute name="inc" type="xsd:unsignedInt" use="optional" default="1"/>
              <xsd:attribute name="justLastX" type="xsd:boolean" use="optional" default="false"/>
              <xsd:attribute name="lockText" type="xsd:boolean" use="optional" default="false"/>
              <xsd:attribute name="max" type="xsd:unsignedInt" use="optional"/>
              <xsd:attribute name="min" type="xsd:unsignedInt" use="optional" default="0"/>
              <xsd:attribute name="multiSel" type="xsd:string" use="optional"/>
              <xsd:attribute name="noThreeD" type="xsd:boolean" use="optional" default="false"/>
              <xsd:attribute name="noThreeD2" type="xsd:boolean" use="optional" default="false"/>
              <xsd:attribute name="page" type="xsd:unsignedInt" use="optional"/>
              <xsd:attribute name="sel" type="xsd:unsignedInt" use="optional"/>
              <xsd:attribute name="seltype" type="ST_SelType" use="optional" default="single"/>
              <xsd:attribute name="textHAlign" type="ST_TextHAlign" use="optional" default="left"/>
              <xsd:attribute name="textVAlign" type="ST TextVAlign" use="optional" default="top"/>
              <xsd:attribute name="val" type="xsd:unsignedInt" use="optional"/>
              <xsd:attribute name="widthMin" type="xsd:unsignedInt" use="optional"/>
              <xsd:attribute name="editVal" type="ST_EditValidation" use="optional"/>
              <xsd:attribute name="multiLine" type="xsd:boolean" use="optional" default="false"/>
              <xsd:attribute name="verticalBar" type="xsd:boolean" use="optional" default="false"/>
              <xsd:attribute name="passwordEdit" type="xsd:boolean" use="optional" default="false"/>
          </xsd:complexType>
          <xsd:simpleType name="ST_ObjectType">
            <xsd:restriction base="xsd:token">
              <xsd:enumeration value="Button"/>
              <xsd:enumeration value="CheckBox"/>
              <xsd:enumeration value="Drop"/>
              <xsd:enumeration value="GBox"/>
              <xsd:enumeration value="Label"/>
              <xsd:enumeration value="List"/>
              <xsd:enumeration value="Radio"/>
              <xsd:enumeration value="Scroll"/>
              <xsd:enumeration value="Spin"/>
              <xsd:enumeration value="EditBox"/>
              <xsd:enumeration value="Dialog"/>
            </xsd:restriction>
          </xsd:simpleType>
          <xsd:simpleType name="ST Checked">
            <xsd:restriction base="xsd:token">
              <xsd:enumeration value="Unchecked"/>
              <xsd:enumeration value="Checked"/>
              <xsd:enumeration value="Mixed"/>
            </xsd:restriction>
          </xsd:simpleType>
          <xsd:simpleType name="ST_DropStyle">
            <xsd:restriction base="xsd:token">
              <xsd:enumeration value="combo"/>
              <xsd:enumeration value="comboedit"/>
              <xsd:enumeration value="simple"/>
            </xsd:restriction>
          </xsd:simpleType>
          <xsd:simpleType name="ST SelType">
            <xsd:restriction base="xsd:token">
              <xsd:enumeration value="single"/>
              <xsd:enumeration value="multi"/>
              <xsd:enumeration value="extended"/>
            </xsd:restriction>
          </xsd:simpleType>
          <xsd:simpleType name="ST_TextHAlign">
            <xsd:restriction base="xsd:string">
              <xsd:enumeration value="left"/>
              <xsd:enumeration value="center"/>
              <xsd:enumeration value="right"/>
              <xsd:enumeration value="justify"/>
              <xsd:enumeration value="distributed"/>
            </xsd:restriction>
          </xsd:simpleType>
```

```
      <xsd:simpleType name="ST TextVAlign">
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="top"/>
          <xsd:enumeration value="center"/>
          <xsd:enumeration value="bottom"/>
          <xsd:enumeration value="justify"/>
          <xsd:enumeration value="distributed"/>
        </xsd:restriction>
      </xsd:simpleType>
      <xsd:simpleType name="ST_EditValidation">
        <xsd:restriction base="xsd:token">
          <xsd:enumeration value="text"/>
          <xsd:enumeration value="integer"/>
          <xsd:enumeration value="number"/>
          <xsd:enumeration value="reference"/>
          <xsd:enumeration value="formula"/>
        </xsd:restriction>
      </xsd:simpleType>
      <xsd:element name="slicers" type="CT Slicers"/>
      <xsd:complexType name="CT_Slicers">
        <xsd:sequence>
          <xsd:element name="slicer" type="CT_Slicer" minOccurs="1" maxOccurs="unbounded"/>
        </xsd:sequence>
      </xsd:complexType>
      <xsd:complexType name="CT_Slicer">
        <xsd:sequence>
          <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
        </xsd:sequence>
        <xsd:attribute name="name" type="x:ST Xstring" use="required"/>
        <xsd:attribute ref="xr10:uid" use="optional"/>
        <xsd:attribute name="cache" type="x:ST Xstring" use="required"/>
        <xsd:attribute name="caption" type="x:ST_Xstring" use="optional"/>
        <xsd:attribute name="startItem" type="xsd:unsignedInt" use="optional" default="0"/>
        <xsd:attribute name="columnCount" type="xsd:unsignedInt" use="optional" default="1"/>
        <xsd:attribute name="showCaption" type="xsd:boolean" use="optional" default="true"/>
        <xsd:attribute name="level" type="xsd:unsignedInt" use="optional" default="0"/>
        <xsd:attribute name="style" type="x:ST_Xstring" use="optional"/>
        <xsd:attribute name="lockedPosition" type="xsd:boolean" use="optional" default="false"/>
        <xsd:attribute name="rowHeight" type="xsd:unsignedInt" use="required"/>
      </xsd:complexType>
    </xsd:schema>
```

5.5   http://schemas.microsoft.com/office/spreadsheetml/2009/9/ac Schema

```
    <xsd:schema targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2009/9/ac"
    elementFormDefault="qualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
    xmlns="http://schemas.microsoft.com/office/spreadsheetml/2009/9/ac">
      <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
    schemaLocation="orel.xsd"/>
      <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
    schemaLocation="xlbasictypes.xsd"/>
      <xsd:attribute name="dyDescent" type="xsd:double"/>
      <xsd:attribute name="knownFonts" type="xsd:boolean"/>
    </xsd:schema>
```

5.6   http://schemas.microsoft.com/office/spreadsheetml/2011/1/ac Schema

```
    <xsd:schema targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2011/1/ac"
    elementFormDefault="qualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main" xmlns="xl12AcSchemaUri">
      <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
    schemaLocation="orel.xsd"/>
      <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
    schemaLocation="xlbasictypes.xsd"/>
```

```
        <xsd:element name="list" type="x:ST_Xstring"/>
      </xsd:schema>
```

5.7   http://schemas.microsoft.com/office/drawing/2012/timeslicer Schema

```
      <xsd:schema elementFormDefault="qualified"
      targetNamespace="http://schemas.microsoft.com/office/drawing/2012/timeslicer"
      xmlns="http://schemas.microsoft.com/office/drawing/2012/timeslicer"
      xmlns:a="http://schemas.openxmlformats.org/drawingml/2006/main"
      xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <xsd:import namespace="http://schemas.openxmlformats.org/drawingml/2006/main"
      schemaLocation="oartdocprop.xsd"/>
        <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
      schemaLocation="orel.xsd"/>
        <xsd:complexType name="CT_Timeline">
          <xsd:sequence>
            <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
      maxOccurs="1"/>
          </xsd:sequence>
          <xsd:attribute name="name" type="xsd:string" use="required"/>
        </xsd:complexType>
        <xsd:element name="timeslicer" type="CT_Timeline"/>
      </xsd:schema>
```

5.8   http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing Schema

```
      <xsd:schema elementFormDefault="qualified"
      targetNamespace="http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing"
      xmlns="http://schemas.microsoft.com/office/excel/2010/spreadsheetDrawing"
      xmlns:xdr="http://schemas.openxmlformats.org/drawingml/2006/spreadsheetDrawing"
      xmlns:xdr14="http://xldr14SchemaUri"
      xmlns:a="http://schemas.openxmlformats.org/drawingml/2006/main"
      xmlns:a14="http://schemas.microsoft.com/office/drawing/2010/main"
      xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
      xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <xsd:import namespace="http://schemas.microsoft.com/office/drawing/2010/main"
      schemaLocation="oart14docprop.xsd"/>
        <xsd:import namespace="http://schemas.openxmlformats.org/drawingml/2006/main"
      schemaLocation="oartdocprop.xsd"/>
        <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
      schemaLocation="orel.xsd"/>
        <xsd:complexType name="CT_ApplicationNonVisualDrawingProps">
          <xsd:attribute name="macro" type="xsd:string" use="optional"/>
          <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
        </xsd:complexType>
        <xsd:complexType name="CT_ContentPartNonVisual">
          <xsd:sequence>
            <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1"
      maxOccurs="1"/>
            <xsd:element name="cNvContentPartPr" type="a14:CT_NonVisualInkContentPartProperties"
      minOccurs="0" maxOccurs="1"/>
          </xsd:sequence>
        </xsd:complexType>
        <xsd:complexType name="CT_ContentPart">
          <xsd:sequence>
            <xsd:element name="nvContentPartPr" type="CT_ContentPartNonVisual" minOccurs="0"
      maxOccurs="1"/>
            <xsd:element name="nvPr" type="CT_ApplicationNonVisualDrawingProps" minOccurs="0"
      maxOccurs="1"/>
            <xsd:element name="xfrm" type="a:CT_Transform2D" minOccurs="0" maxOccurs="1"/>
            <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
      maxOccurs="1"/>
          </xsd:sequence>
          <xsd:attribute ref="r:id" use="required"/>
          <xsd:attribute name="bwMode" type="a:ST_BlackWhiteMode" use="optional" default="auto"/>
```

```
    </xsd:complexType>
    <xsd:element name="contentPart" type="CT_ContentPart"/>
</xsd:schema>
```

5.9 http://schemas.microsoft.com/office/spreadsheetml/2010/11/ac Schema

```
<xsd:schema targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2010/11/ac"
elementFormDefault="qualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2010/11/ac">
  <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
schemaLocation="orel.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:complexType name="CT_AbsolutePath">
    <xsd:attribute name="url" use="required" type="x:ST_Xstring"/>
  </xsd:complexType>
  <xsd:element name="absPath" type="CT_AbsolutePath"/>
</xsd:schema>
```

5.10 http://schemas.microsoft.com/office/spreadsheetml/2014/11/main Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2014/11/main"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2014/11/main"
elementFormDefault="qualified">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
schemaLocation="orel.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlworkbook.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlsheet.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlpivot.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlextconns.xsd"/>
  <xsd:complexType name="CT_ModelTimeGroupings">
    <xsd:sequence>
      <xsd:element name="modelTimeGrouping" minOccurs="1" maxOccurs="unbounded"
type="CT_ModelTimeGrouping"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:element name="modelTimeGroupings" type="CT_ModelTimeGroupings"/>
  <xsd:complexType name="CT_ModelTimeGrouping">
    <xsd:sequence>
      <xsd:element name="calculatedTimeColumn" minOccurs="1" maxOccurs="unbounded"
type="CT_CalculatedTimeColumn"/>
    </xsd:sequence>
    <xsd:attribute name="tableName" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="columnName" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="columnId" type="x:ST_Xstring" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_CalculatedTimeColumn">
    <xsd:attribute name="columnName" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="columnId" type="x:ST_Xstring" use="required"/>
    <xsd:attribute name="contentType" type="ST_ModelTimeGroupingContentType" use="required"/>
    <xsd:attribute name="isSelected" type="xsd:boolean" use="required"/>
  </xsd:complexType>
  <xsd:simpleType name="ST_ModelTimeGroupingContentType">
    <xsd:restriction base="x:ST_Xstring">
```

```
              <xsd:enumeration value="years"/>
              <xsd:enumeration value="quarters"/>
              <xsd:enumeration value="monthsindex"/>
              <xsd:enumeration value="months"/>
              <xsd:enumeration value="daysindex"/>
              <xsd:enumeration value="days"/>
              <xsd:enumeration value="hours"/>
              <xsd:enumeration value="minutes"/>
              <xsd:enumeration value="seconds"/>
         </xsd:restriction>
      </xsd:simpleType>
</xsd:schema>
```

5.11 http://schemas.microsoft.com/office/spreadsheetml/2015/02/main Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2015/02/main"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2015/02/main"
elementFormDefault="qualified">
   <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
   <xsd:attribute name="formatCode16" type="x:ST_Xstring"/>
</xsd:schema>
```

5.12 http://schemas.microsoft.com/office/spreadsheetml/2016/revision10 Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
   <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
   <xsd:attribute name="uid" type="x:ST_Guid"/>
   <xsd:attribute name="uidLastSave" type="x:ST_Guid"/>
</xsd:schema>
```

5.13 http://schemas.microsoft.com/office/spreadsheetml/2016/revision9 Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision9"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2016/revision9"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
   <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
   <xsd:attribute name="uid" type="x:ST_Guid"/>
</xsd:schema>
```

5.14 http://schemas.microsoft.com/office/spreadsheetml/2016/revision6 Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision6"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2016/revision6"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
```

```
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:attribute name="uid" type="x:ST_Guid"/>
  <xsd:attribute name="coauthVersionLast" type="xsd:unsignedInt"/>
  <xsd:attribute name="coauthVersionMax" type="xsd:unsignedInt"/>
</xsd:schema>
```

5.15 http://schemas.microsoft.com/office/spreadsheetml/2014/revision Schema

```
<xsd:schema targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2014/revision"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2014/revision"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns:xr6="http://schemas.microsoft.com/office/spreadsheetml/2016/revision6"
xmlns:xr10="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlstyles.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision6"
schemaLocation="xlrevexignore6.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision10"
schemaLocation="xlrevexignore10.xsd"/>
  <xsd:simpleType name="ST_Xrevid">
    <xsd:restriction base="xsd:unsignedLong"/>
  </xsd:simpleType>
  <xsd:complexType name="CT_RevisionPtr">
    <xsd:attribute name="revIDLastSave" type="ST_Xrevid" use="required"/>
    <xsd:attribute name="documentId" type="x:ST_Xstring" use="required"/>
    <xsd:attribute ref="xr6:coauthVersionLast" use="optional" default="0"/>
    <xsd:attribute ref="xr6:coauthVersionMax" use="optional" default="0"/>
    <xsd:attribute ref="xr10:uidLastSave" use="optional"/>
  </xsd:complexType>
  <xsd:attribute name="uid" type="x:ST_Guid"/>
  <xsd:element name="revisionPtr" type="CT_RevisionPtr"/>
</xsd:schema>
```

5.16 http://schemas.microsoft.com/office/spreadsheetml/2015/revision2 Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2015/revision2"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2015/revision2"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:attribute name="uid" type="x:ST_Guid"/>
</xsd:schema>
```

5.17 http://schemas.microsoft.com/office/spreadsheetml/2016/revision3 Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision3"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2016/revision3"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:attribute name="uid" type="x:ST_Guid"/>
```

```
</xsd:schema>
```

5.18 http://schemas.microsoft.com/office/spreadsheetml/2016/revision5 Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2016/revision5"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2016/revision5"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlstyles.xsd"/>
</xsd:schema>
```

5.19 http://schemas.microsoft.com/office/spreadsheetml/2016/pivotdefaultlayout Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2016/pivotdefaultlayout"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2016/pivotdefaultlayout"
elementFormDefault="qualified">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
schemaLocation="orel.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlworkbook.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlsheet.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlpivot.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlextconns.xsd"/>
  <xsd:element name="pivotTableDefinition16" type="CT_PivotTableDefinition16"/>
  <xsd:complexType name="CT_PivotTableDefinition16">
    <xsd:attribute name="EnabledSubtotalsDefault" type="xsd:boolean" use="optional"
default="true"/>
    <xsd:attribute name="SubtotalsOnTopDefault" type="xsd:boolean" use="optional"
default="true"/>
    <xsd:attribute name="InsertBlankRowDefault" type="xsd:boolean" use="optional"
default="false"/>
  </xsd:complexType>
</xsd:schema>
```

5.20 http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2 Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2"
elementFormDefault="qualified"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns:x2="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
schemaLocation="xl14.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlsheet.xsd"/>
```

```
<xsd:import
namespace="http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh"
schemaLocation="xlrichvaluerefresh.xsd"/>
  <xsd:element name="filterColumn" type="CT_RichFilterColumn"/>
  <xsd:complexType name="CT_RichFilterColumn">
    <xsd:choice minOccurs="0" maxOccurs="1">
      <xsd:element name="filters" type="CT_RichFilters"/>
      <xsd:element name="top10" type="CT_RichTop10"/>
      <xsd:element name="customFilters" type="CT_CustomRichFilters"/>
      <xsd:element name="dynamicFilter" type="CT_DynamicRichFilter"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList"/>
    </xsd:choice>
  </xsd:complexType>
  <xsd:complexType name="CT_RichFilters">
    <xsd:sequence>
      <xsd:element name="filter" type="CT_RichFilter" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element name="dateGroupItem" type="CT_RichDateGroupItem" minOccurs="0"
maxOccurs="unbounded"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_RichFilter">
    <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
    <xsd:attribute name="val" type="x:ST_Xstring" use="optional"/>
    <xsd:attribute name="blank" type="xsd:boolean" use="optional"/>
    <xsd:attribute name="nodata" type="xsd:boolean" use="optional"/>
  </xsd:complexType>
  <xsd:complexType name="CT_CustomRichFilters">
    <xsd:sequence>
      <xsd:choice minOccurs="1" maxOccurs="2">
        <xsd:element name="customFilter" minOccurs="0" maxOccurs="1"
type="CT_CustomRichFilter"/>
        <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="x:CT_ExtensionList"/>
      </xsd:choice>
    </xsd:sequence>
    <xsd:attribute name="and" type="xsd:boolean" use="optional" default="false"/>
  </xsd:complexType>
  <xsd:complexType name="CT_CustomRichFilter">
    <xsd:complexContent>
      <xsd:extension base="x:CT_CustomFilter">
        <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="CT_RichTop10">
    <xsd:complexContent>
      <xsd:extension base="x:CT_Top10">
        <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="CT_DynamicRichFilter">
    <xsd:complexContent>
      <xsd:extension base="x:CT_DynamicFilter">
        <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="CT_RichDateGroupItem">
    <xsd:complexContent>
      <xsd:extension base="x:CT_DateGroupItem">
        <xsd:attribute name="key" type="ST_RichFilterKey" use="optional"/>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:simpleType name="ST_RichFilterKey">
    <xsd:restriction base="x:ST_Xstring"/>
  </xsd:simpleType>
  <xsd:element name="richSortCondition" type="CT_RichSortCondition"/>
```

```xml
<xsd:complexType name="CT RichSortCondition">
  <xsd:complexContent>
    <xsd:extension base="x2:CT_SortCondition">
      <xsd:attribute name="richSortKey" type="x:ST_Xstring" use="optional"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:element name="supportingPropertyBags" type="CT_SupportingPropertyBags"/>
<xsd:complexType name="CT_SupportingPropertyBags">
  <xsd:sequence>
    <xsd:element name="spbArrays" minOccurs="0" maxOccurs="1"
type="CT_SupportingPropertyBagArrayData"/>
    <xsd:element name="spbData" minOccurs="1" maxOccurs="1"
type="CT_SupportingPropertyBagData"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT SupportingPropertyBagData">
  <xsd:sequence>
    <xsd:element name="spb" minOccurs="0" maxOccurs="unbounded"
type="CT_SupportingPropertyBag"/>
    <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
<xsd:complexType name="CT_SupportingPropertyBag">
  <xsd:sequence>
    <xsd:element name="v" minOccurs="1" maxOccurs="unbounded"
type="CT_SupportingPropertyBagValue"/>
  </xsd:sequence>
  <xsd:attribute name="s" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
<xsd:complexType name="CT_SupportingPropertyBagValue">
  <xsd:simpleContent>
    <xsd:extension base="x:ST Xstring"/>
  </xsd:simpleContent>
</xsd:complexType>
<xsd:element name="spbStructures" type="CT_SupportingPropertyBagStructures"/>
<xsd:complexType name="CT_SupportingPropertyBagStructures">
  <xsd:sequence>
    <xsd:element name="s" minOccurs="0" maxOccurs="unbounded"
type="CT_SupportingPropertyBagStructure"/>
    <xsd:element name="extLst" type="x:CT ExtensionList" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
<xsd:complexType name="CT SupportingPropertyBagStructure">
  <xsd:sequence>
    <xsd:element name="k" minOccurs="1" maxOccurs="unbounded"
type="CT_SupportingPropertyBagKey"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT SupportingPropertyBagKey">
  <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
  <xsd:attribute name="t" type="ST SupportingPropertyBagValueType" use="optional"
default="d"/>
</xsd:complexType>
<xsd:simpleType name="ST SupportingPropertyBagValueType">
  <xsd:restriction base="x:ST_Xstring">
    <xsd:enumeration value="d"/>
    <xsd:enumeration value="i"/>
    <xsd:enumeration value="b"/>
    <xsd:enumeration value="s"/>
    <xsd:enumeration value="spb"/>
    <xsd:enumeration value="spba"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="CT_SupportingPropertyBagArrayData">
  <xsd:sequence>
```

```xsd
      <xsd:element name="a" minOccurs="0" maxOccurs="unbounded"
type="CT_SupportingPropertyBagArray"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_SupportingPropertyBagArray">
    <xsd:sequence>
      <xsd:element name="v" minOccurs="1" maxOccurs="unbounded"
type="CT_SupportingPropertyBagArrayValue"/>
    </xsd:sequence>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_SupportingPropertyBagArrayValue">
    <xsd:simpleContent>
      <xsd:extension base="x:ST_Xstring">
        <xsd:attribute name="t" type="ST_SupportingPropertyBagArrayValueType" use="optional"
default="d"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:simpleType name="ST_SupportingPropertyBagArrayValueType">
    <xsd:restriction base="x:ST_Xstring">
      <xsd:enumeration value="d"/>
      <xsd:enumeration value="i"/>
      <xsd:enumeration value="b"/>
      <xsd:enumeration value="s"/>
      <xsd:enumeration value="spb"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:element name="arrayData" type="CT_ArrayData"/>
  <xsd:complexType name="CT_ArrayData">
    <xsd:sequence>
      <xsd:element name="a" minOccurs="0" maxOccurs="unbounded" type="CT_Array"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_Array">
    <xsd:sequence>
      <xsd:element name="v" minOccurs="1" maxOccurs="unbounded" type="CT_ArrayValue"/>
    </xsd:sequence>
    <xsd:attribute name="r" type="xsd:unsignedInt" use="required"/>
    <xsd:attribute name="c" type="xsd:unsignedInt" use="optional" default="1"/>
  </xsd:complexType>
  <xsd:complexType name="CT_ArrayValue">
    <xsd:simpleContent>
      <xsd:extension base="x:ST_Xstring">
        <xsd:attribute name="t" type="ST_ArrayValueType" use="optional" default="d"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:simpleType name="ST_ArrayValueType">
    <xsd:restriction base="x:ST_Xstring">
      <xsd:enumeration value="d"/>
      <xsd:enumeration value="i"/>
      <xsd:enumeration value="b"/>
      <xsd:enumeration value="e"/>
      <xsd:enumeration value="s"/>
      <xsd:enumeration value="r"/>
      <xsd:enumeration value="a"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:element name="richStyleSheet" type="CT_RichStylesheet"/>
  <xsd:complexType name="CT_RichStylesheet">
    <xsd:sequence>
      <xsd:element name="dxfs" type="x:CT_Dxfs" minOccurs="0" maxOccurs="1"/>
      <xsd:element name="richProperties" type="CT_RichFormatProperties" minOccurs="0"
maxOccurs="1"/>
```

```xsd
        <xsd:element name="richStyles" type="CT_RichStyles" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_RichFormatProperties">
     <xsd:sequence>
       <xsd:element name="rPr" minOccurs="1" maxOccurs="unbounded"
type="CT_RichFormatProperty"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_RichFormatProperty">
     <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
     <xsd:attribute name="t" type="ST_RichFormatPropertyType" use="required"/>
   </xsd:complexType>
   <xsd:simpleType name="ST_RichFormatPropertyType">
     <xsd:restriction base="x:ST_Xstring">
       <xsd:enumeration value="b"/>
       <xsd:enumeration value="n"/>
       <xsd:enumeration value="i"/>
       <xsd:enumeration value="s"/>
     </xsd:restriction>
   </xsd:simpleType>
   <xsd:complexType name="CT_RichStyles">
     <xsd:sequence>
       <xsd:element name="rSty" minOccurs="1" maxOccurs="unbounded" type="CT_RichStyle"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_RichStyle">
     <xsd:sequence>
       <xsd:element name="rpv" minOccurs="0" maxOccurs="unbounded"
type="CT_RichStylePropertyValue"/>
     </xsd:sequence>
     <xsd:attribute name="dxfid" type="x:ST_DxfId" use="optional"/>
   </xsd:complexType>
   <xsd:complexType name="CT_RichStylePropertyValue">
     <xsd:simpleContent>
       <xsd:extension base="xsd:string">
         <xsd:attribute name="i" type="xsd:unsignedInt" use="required"/>
       </xsd:extension>
     </xsd:simpleContent>
   </xsd:complexType>
   <xsd:element name="rvTypesInfo" type="CT_RichValueTypesInfo"/>
   <xsd:complexType name="CT_RichValueTypesInfo">
     <xsd:sequence>
       <xsd:element name="global" minOccurs="0" maxOccurs="1" type="CT_RichValueGlobalType"/>
       <xsd:element name="types" minOccurs="0" maxOccurs="1" type="CT_RichValueTypes"/>
       <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_RichValueTypes">
     <xsd:sequence>
       <xsd:element name="type" minOccurs="0" maxOccurs="unbounded" type="CT_RichValueType"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_RichValueGlobalType">
     <xsd:sequence>
       <xsd:element name="keyFlags" minOccurs="0" maxOccurs="1"
type="CT_RichValueTypeKeyFlags"/>
       <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
     </xsd:sequence>
   </xsd:complexType>
   <xsd:complexType name="CT_RichValueType">
     <xsd:sequence>
       <xsd:element name="keyFlags" minOccurs="0" maxOccurs="1"
type="CT_RichValueTypeKeyFlags"/>
       <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
     </xsd:sequence>
     <xsd:attribute name="name" type="xsd:string" use="required"/>
   </xsd:complexType>
```

```
  <xsd:complexType name="CT RichValueTypeKeyFlags">
    <xsd:sequence>
      <xsd:element name="key" minOccurs="1" maxOccurs="unbounded"
  type="CT_RichValueTypeReservedKey"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_RichValueTypeReservedKey">
    <xsd:sequence>
      <xsd:element name="flag" minOccurs="1" maxOccurs="unbounded"
  type="CT_RichValueTypeReservedKeyFlag"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_RichValueTypeReservedKeyFlag">
    <xsd:attribute name="name" type="xsd:string" use="required"/>
    <xsd:attribute name="value" type="xsd:boolean" use="required"/>
  </xsd:complexType>
</xsd:schema>
```

5.21 http://schemas.microsoft.com/office/spreadsheetml/2017/richdata Schema

```
<xsd:schema targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2017/richdata"
elementFormDefault="qualified"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2017/richdata"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:element name="rvData" type="CT_RichValueData"/>
  <xsd:complexType name="CT_RichValueData">
    <xsd:sequence>
      <xsd:element name="rv" minOccurs="0" maxOccurs="unbounded" type="CT RichValue"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_RichValue">
    <xsd:sequence>
      <xsd:element name="fb" minOccurs="0" maxOccurs="1" type="CT_RichValueFallback"/>
      <xsd:element name="v" minOccurs="1" maxOccurs="unbounded" type="CT_Value"/>
    </xsd:sequence>
    <xsd:attribute name="s" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT Value">
    <xsd:simpleContent>
      <xsd:extension base="x:ST_Xstring"/>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:element name="rvStructures" type="CT_RichValueStructures"/>
  <xsd:complexType name="CT RichValueFallback">
    <xsd:simpleContent>
      <xsd:extension base="xsd:string">
        <xsd:attribute name="t" type="ST_RichValueFallbackType" use="optional" default="n"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:simpleType name="ST_RichValueFallbackType">
    <xsd:restriction base="x:ST_Xstring">
      <xsd:enumeration value="b"/>
      <xsd:enumeration value="n"/>
      <xsd:enumeration value="e"/>
      <xsd:enumeration value="s"/>
    </xsd:restriction>
  </xsd:simpleType>
  <xsd:complexType name="CT RichValueStructures">
    <xsd:sequence>
```

```
        <xsd:element name="s" minOccurs="0" maxOccurs="unbounded"
type="CT_RichValueStructure"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="count" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT_RichValueStructure">
      <xsd:sequence>
        <xsd:element name="k" minOccurs="1" maxOccurs="unbounded" type="CT_Key"/>
      </xsd:sequence>
      <xsd:attribute name="t" type="xsd:string" use="required"/>
    </xsd:complexType>
    <xsd:complexType name="CT_Key">
      <xsd:attribute name="n" type="x:ST_Xstring" use="required"/>
      <xsd:attribute name="t" type="ST_RichValueValueType" use="optional" default="d"/>
    </xsd:complexType>
    <xsd:simpleType name="ST_RichValueValueType">
      <xsd:restriction base="x:ST_Xstring">
        <xsd:enumeration value="d"/>
        <xsd:enumeration value="i"/>
        <xsd:enumeration value="b"/>
        <xsd:enumeration value="e"/>
        <xsd:enumeration value="s"/>
        <xsd:enumeration value="r"/>
        <xsd:enumeration value="a"/>
        <xsd:enumeration value="spb"/>
      </xsd:restriction>
    </xsd:simpleType>
    <xsd:element name="rvb" type="CT_RichValueBlock"/>
    <xsd:complexType name="CT_RichValueBlock">
      <xsd:attribute name="i" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
</xsd:schema>
```

5.22 http://schemas.microsoft.com/office/spreadsheetml/2018/calcfeatures Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2018/calcfeatures"
elementFormDefault="qualified"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2018/calcfeatures"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
    <xsd:element name="calcFeatures" type="CT_CalcFeatures"/>
    <xsd:complexType name="CT_CalcFeatures">
      <xsd:sequence>
        <xsd:element name="feature" minOccurs="1" maxOccurs="unbounded" type="CT_CalcFeature"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_CalcFeature">
      <xsd:attribute name="name" type="xsd:string" use="required"/>
    </xsd:complexType>
</xsd:schema>
```

5.23 http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments"
elementFormDefault="qualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2018/threadedcomments">
```

```
    <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
    <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlsst.xsd"/>
    <xsd:import
namespace="http://schemas.microsoft.com/office/spreadsheetml/2020/threadedcomments2"
schemaLocation="xlThreadedComments2.xsd"/>
    <xsd:element name="personList" type="CT_PersonList"/>
    <xsd:complexType name="CT_PersonList">
      <xsd:sequence>
        <xsd:element name="person" type="CT_Person" minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_Person">
      <xsd:sequence>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="displayName" type="x:ST_Xstring" use="required"/>
      <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="userId" type="x:ST_Xstring" use="optional"/>
      <xsd:attribute name="providerId" type="x:ST_Xstring" use="optional"/>
    </xsd:complexType>
    <xsd:element name="ThreadedComments" type="CT_ThreadedComments"/>
    <xsd:complexType name="CT_ThreadedComments">
      <xsd:sequence>
        <xsd:element name="threadedComment" type="CT_ThreadedComment" minOccurs="0"
maxOccurs="unbounded"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_ThreadedComment">
      <xsd:sequence>
        <xsd:element name="text" type="x:ST_Xstring" minOccurs="0" maxOccurs="1"/>
        <xsd:element name="mentions" type="CT_ThreadedCommentMentions" minOccurs="0"
maxOccurs="1"/>
        <xsd:element name="extLst" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="ref" type="x:ST_Ref" use="optional"/>
      <xsd:attribute name="dT" type="xsd:dateTime" use="optional"/>
      <xsd:attribute name="personId" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="parentId" type="x:ST_Guid" use="optional"/>
      <xsd:attribute name="done" type="xsd:boolean" use="optional"/>
    </xsd:complexType>
    <xsd:complexType name="CT_ThreadedCommentMentions">
      <xsd:sequence>
        <xsd:element name="mention" type="CT_Mention" minOccurs="0" maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="CT_Mention">
      <xsd:attribute name="mentionpersonId" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="mentionId" type="x:ST_Guid" use="required"/>
      <xsd:attribute name="startIndex" type="xsd:unsignedInt" use="required"/>
      <xsd:attribute name="length" type="xsd:unsignedInt" use="required"/>
    </xsd:complexType>
</xsd:schema>
```

5.24 http://schemas.microsoft.com/office/spreadsheetml/2018/08/main Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2018/08/main"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2018/08/main"
elementFormDefault="qualified">
  <xsd:attribute name="misleadingFormat" type="xsd:boolean"/>
</xsd:schema>
```

5.25 http://schemas.microsoft.com/office/spreadsheetml/2017/dynamicarray Schema

```xsd
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2017/dynamicarray"
elementFormDefault="qualified"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2017/dynamicarray"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:element name="dynamicArrayProperties" type="CT_DynamicArrayProperties"/>
  <xsd:complexType name="CT_DynamicArrayProperties">
    <xsd:sequence>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="fDynamic" type="xsd:boolean" use="optional"/>
    <xsd:attribute name="fCollapsed" type="xsd:boolean" use="optional"/>
  </xsd:complexType>
</xsd:schema>
```

5.26 http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews Schema

```xsd
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews"
elementFormDefault="qualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns:x14="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
xmlns:xlrd2="http://schemas.microsoft.com/office/spreadsheetml/2017/richdata2"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2019/namedsheetviews">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlautofilter.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:import namespace="http://schemas.microsoft.com/office/spreadsheetml/2009/9/main"
schemaLocation="xl14.xsd"/>
  <xsd:element name="namedSheetViews" type="CT_NamedSheetViews"/>
  <xsd:complexType name="CT_NamedSheetViews">
    <xsd:sequence>
      <xsd:element name="namedSheetView" type="CT_NamedSheetView" minOccurs="0"
maxOccurs="unbounded"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_NamedSheetView">
    <xsd:sequence>
      <xsd:element name="nsvFilter" type="CT_NsvFilter" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string" use="required"/>
    <xsd:attribute name="id" type="x:ST_Guid" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="CT_NsvFilter">
    <xsd:sequence>
      <xsd:element name="columnFilter" minOccurs="0" maxOccurs="unbounded"
type="CT_ColumnFilter"/>
      <xsd:element name="sortRules" minOccurs="0" maxOccurs="1" type="CT_SortRules"/>
      <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="filterId" type="x:ST_Guid" use="required"/>
    <xsd:attribute name="ref" type="x:ST_Ref" use="optional"/>
    <xsd:attribute name="tableId" type="xsd:unsignedInt" use="optional"/>
  </xsd:complexType>
  <xsd:complexType name="CT_ColumnFilter">
    <xsd:sequence>
      <xsd:element name="dxf" type="x:CT_Dxf" minOccurs="0" maxOccurs="1"/>
```

```
        <xsd:element name="filter" minOccurs="0" maxOccurs="unbounded"
type="x:CT_FilterColumn"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attributeGroup ref="AG_ColumnId"/>
    </xsd:complexType>
    <xsd:complexType name="CT_SortRules">
      <xsd:sequence>
        <xsd:element name="sortRule" minOccurs="0" maxOccurs="64" type="CT_SortRule"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
      <xsd:attribute name="sortMethod" type="x:ST_SortMethod" use="optional" default="none"/>
      <xsd:attribute name="caseSensitive" type="xsd:boolean" use="optional" default="false"/>
    </xsd:complexType>
    <xsd:complexType name="CT_SortRule">
      <xsd:sequence>
        <xsd:element name="dxf" type="x:CT_Dxf" minOccurs="0" maxOccurs="1"/>
        <xsd:choice minOccurs="0" maxOccurs="1">
          <xsd:element name="sortCondition" minOccurs="0" maxOccurs="1"
type="x14:CT_SortCondition"/>
          <xsd:element name="richSortCondition" minOccurs="0" maxOccurs="1"
type="xlrd2:CT_RichSortCondition"/>
        </xsd:choice>
      </xsd:sequence>
      <xsd:attributeGroup ref="AG_ColumnId"/>
    </xsd:complexType>
    <xsd:attributeGroup name="AG_ColumnId">
      <xsd:attribute name="colId" type="xsd:unsignedInt" use="required"/>
      <xsd:attribute name="id" type="x:ST_Guid" use="optional"/>
    </xsd:attributeGroup>
</xsd:schema>
```

5.27 http://schemas.microsoft.com/office/spreadsheetml/2019/extlinksprops Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2019/extlinksprops"
elementFormDefault="qualified"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2019/extlinksprops"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:element name="externalLinksPr" type="CT_ExternalLinksPr"/>
  <xsd:complexType name="CT_ExternalLinksPr">
    <xsd:attribute name="autoRefresh" type="xsd:boolean" use="optional" default="false"/>
  </xsd:complexType>
</xsd:schema>
```

5.28 http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage"
elementFormDefault="qualified"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2020/richdatawebimage"
xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:import namespace="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
schemaLocation="orel.xsd"/>
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:element name="webImagesSrd" type="CT_WebImagesSupportingRichData"/>
  <xsd:complexType name="CT_WebImagesSupportingRichData">
    <xsd:sequence>
```

```
        <xsd:element name="webImageSrd" minOccurs="0" maxOccurs="unbounded"
type="CT_WebImageSupportingRichData"/>
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT WebImageSupportingRichData">
    <xsd:sequence>
      <xsd:element name="address" minOccurs="1" maxOccurs="1"
type="CT_WebImageSupportingRichDataRelationship"/>
      <xsd:element name="moreImagesAddress" minOccurs="0" maxOccurs="1"
type="CT WebImageSupportingRichDataRelationship"/>
      <xsd:element name="blip" minOccurs="0" maxOccurs="1"
type="CT_WebImageSupportingRichDataRelationship"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_WebImageSupportingRichDataRelationship">
    <xsd:attribute ref="r:id" use="required"/>
  </xsd:complexType>
</xsd:schema>
```

5.29 http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020 Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2020/pivotNov2020"
elementFormDefault="qualified">
  <xsd:import namespace="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
schemaLocation="xlbasictypes.xsd"/>
  <xsd:element name="implicitMeasureSupport" type="xsd:boolean"/>
  <xsd:element name="ignorableAfterVersion" type="CT_Ignorable"/>
  <xsd:complexType name="CT_Ignorable">
    <xsd:attribute name="version" type="xsd:unsignedByte" use="required"/>
  </xsd:complexType>
  <xsd:element name="dataFieldFutureData" type="CT DataFieldFutureData"/>
  <xsd:complexType name="CT_DataFieldFutureData">
    <xsd:attribute name="version" type="xsd:unsignedByte" use="required"/>
    <xsd:attribute name="sourceField" type="xsd:unsignedInt" use="required"/>
  </xsd:complexType>
</xsd:schema>
```

5.30 http://schemas.microsoft.com/office/spreadsheetml/2020/threadedcomments 2 Schema

```
<xsd:schema xmlns="http://schemas.microsoft.com/office/spreadsheetml/2020/threadedcomments2"
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2020/threadedcomments2"
elementFormDefault="qualified" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns:xm="http://schemas.microsoft.com/office/excel/2006/main">
  <xsd:import namespace="http://schemas.microsoft.com/office/excel/2006/main"
schemaLocation="xlmbasictypes.xsd"/>
  <xsd:complexType name="CT ThreadedComments2Ext">
    <xsd:sequence>
      <xsd:element name="checksum" type="xsd:unsignedInt" minOccurs="1" maxOccurs="1"/>
      <xsd:sequence>
        <xsd:element name="hyperlink" type="CT_CommentHyperlink" minOccurs="0"
maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_CommentHyperlink">
    <xsd:sequence>
```

```
        <xsd:element name="extLst" type="x:CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="startIndex" type="xsd:unsignedInt" use="required"/>
    <xsd:attribute name="length" type="xsd:unsignedInt" use="required"/>
    <xsd:attribute name="url" type="x:ST_Xstring" use="required"/>
  </xsd:complexType>
</xsd:schema>
```

5.31 http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh Schema

```
<xsd:schema
targetNamespace="http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh"
elementFormDefault="qualified"
xmlns:x="http://schemas.openxmlformats.org/spreadsheetml/2006/main"
xmlns="http://schemas.microsoft.com/office/spreadsheetml/2020/richvaluerefresh"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:element name="refreshIntervals" type="CT_RichValueRefreshIntervals"/>
  <xsd:complexType name="CT_RichValueRefreshIntervals">
    <xsd:sequence>
      <xsd:element name="refreshInterval" minOccurs="1" maxOccurs="unbounded"
type="CT_RichValueRefreshInterval"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="CT_RichValueRefreshInterval">
    <xsd:attribute name="resourceIdInt" type="xsd:int" use="optional"/>
    <xsd:attribute name="resourceIdStr" type="xsd:string" use="optional"/>
    <xsd:attribute name="interval" type="xsd:int" use="required"/>
  </xsd:complexType>
</xsd:schema>
```

6   Appendix B: Product Behavior

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

- Microsoft Office Excel 2007

- Microsoft Excel 2010

- Microsoft Excel 2013

- Microsoft Excel 2016

- Microsoft Excel 2019

- Microsoft Excel 2021

Exceptions, if any, are noted in this section. If an update version, service pack or Knowledge Base (KB) number appears with a product name, the behavior changed in that update. The new behavior also applies to subsequent updates unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

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

<1> Section 2.2: This namespace was introduced in Excel 2013.

<2> Section 2.2: This namespace was introduced in Excel 2010.

<3> Section 2.2: This namespace was introduced in Excel 2010.

<4> Section 2.2: This namespace was introduced in Excel 2013.

<5> Section 2.2: This namespace was introduced in Excel 2013.

<6> Section 2.5.4: This attribute is available only in Excel 2016.

<7> Section 2.6.3: Office Excel 2007, Excel 2010, and Excel 2013 do not write the correct value into this **field** sometimes. Although the value of this field is validated on load, it is not used at run time.

<8> Section 2.6.3: Office Excel 2007, Excel 2010, and Excel 2013 do not write the correct value into this field sometimes. Although the value of this field is validated on load, it is not used at run time.

<9> Section 2.6.10: The following table shows the different versions of function accuracy that Excel 2010 and Excel 2013 supports.

Value	Meaning
0	Functions are calculated using the current application's algorithms.
1	Functions are calculated using algorithms implemented in Office Excel 2007.
2	Functions are calculated using algorithms implemented in Excel 2010.

<10> Section 2.6.24: Office Excel 2007 does not support multiple uses of the same **OLAP measure** in one cache hierarchy, and does not discard the associated cache hierarchy when **ignore** is TRUE.

<11> Section 2.6.25: Office Excel 2007 will not ignore the **fld** attribute of the ancestor **CT_DataField** ([ISO/IEC29500-4:2016] section A.2).

<12> Section 2.6.30: Office Excel 2007 does not ignore these complex types.

<13> Section 2.6.31: Office Excel 2007 does not support multiple uses of the same OLAP measure in one PivotTable view, and does not ignore this pivot field when **ignore** is TRUE.

<14> Section 2.6.34: The 2007 Microsoft Office system does not load a file in which this field contains a value that it does not recognize, or is not recognized by the underlying operating system. The 2007 Office system recognizes the following language tags.

Language	Locale	Language tag
Afrikaans	South Africa	af-ZA
Albanian	Albania	sq-AL
Alsatian	France	gsw-FR
Amharic	Ethiopia	am-ET
Arabic	Algeria	ar-DZ
Arabic	Kingdom of Bahrain	ar-BH
Arabic	Egypt	ar-EG
Arabic	Iraq	ar-IQ
Arabic	Jordan	ar-JO
Arabic	Kuwait	ar-KW
Arabic	Lebanon	ar-LB
Arabic	Libya	ar-LY
Arabic	Morocco	ar-MA
Arabic	Oman	ar-OM
Arabic	Qatar	ar-QA
Arabic	Saudi Arabia	ar-SA
Arabic	Syria	ar-SY
Arabic	Tunisia	ar-TN
Arabic	U.A.E.	ar-AE
Arabic	Yemen	ar-YE
Armenian	Armenia	hy-AM
Assamese	India	as-IN
Azerbaijani (Cyrillic)	Azerbaijan	az-AZ-Cyrl
Azerbaijani (Latin)	Azerbaijan	az-AZ-Latn

Language	Locale	Language tag
Bangla	Bangladesh	bn-BD
Bangla (Bangla Script)	India	bn-IN
Bashkir	Russia	ba-RU
Basque	Basque (Basque)	eu-ES
Belarusian	Belarus	be-BY
Bhutanese	Bhutan	bo-BT
Bosnian (Cyrillic)	Bosnia and Herzegovina	bs-BA-Cyrl
Bosnian (Latin)	Bosnia and Herzegovina	bs-BA-Latn
Breton	France	br-FR
Bulgarian	Bulgaria	bg-BG
Catalan	Catalan	ca-ES
Chinese	Hong Kong SAR	zh-HK
Chinese	Macao SAR	zh-MO
Chinese	PRC	zh-CN
Chinese	Singapore	zh-SG
Chinese	Taiwan	zh-TW
Corsican	France	co-FR
Croatian	Croatia	hr-HR
Croatian (Latin)	Bosnia and Herzegovina	hr-BA-Latn
Czech	Czech Republic	cs-CZ
Danish	Denmark	da-DK
Dari	Afghanistan	prs-AF
Divehi	Maldives	div-MV
Dutch	Belgium	nl-BE
Dutch	Netherlands	nl-NL
English	Australia	en-AU
English	Belize	en-BZ
English	Canada	en-CA

Language	Locale	Language tag
English	Caribbean	en-CB
English	India	en-IN
English	Ireland	en-IE
English	Jamaica	en-JM
English	Malaysia	en-MY
English	New Zealand	en-NZ
English	Philippines	en-PH
English	South Africa	en-ZA
English	Trinidad	en-TT
English	United Kingdom	en-GB
English	United States	en-US
English	Zimbabwe	en-ZW
Estonian	Estonia	et-EE
Faroese	Faroe Islands	fo-FO
Filipino	Philippines	fil-PH
Finnish	Finland	fi-FI
French	Belgium	fr-BE
French	Canada	fr-CA
French	France	fr-FR
French	Luxembourg	fr-LU
French	Monaco	fr-MC
French	Switzerland	fr-CH
Frisian	Netherlands	fy-NL
Galician	Galicia	gl-ES
Georgian	Georgia	ka-GE
German	Austria	de-AT
German	Germany	de-DE
German	Liechtenstein	de-LI

Language	Locale	Language tag
German	Luxembourg	de-LU
German	Switzerland	de-CH
Greek	Greece	el-GR
Greenlandic	Greenland	kl-GL
Gujarati (Gujarati Script)	India	gu-IN
Hausa (Latin)	Nigeria	ha-NG-Latn
Hebrew	Israel	he-IL
Hindi	India	hi-IN
Hungarian	Hungary	hu-HU
Icelandic	Iceland	is-IS
Igbo	Nigeria	ig-NG
Inari Sami	Finland	smn-FI
Indonesian	Indonesia	id-ID
Inuktitut (Latin)	Canada	iu-CA-Latn
Inuktitut (Syllabics)	Canada	iu-CA-Cans
Irish	Ireland	ga-IE
isiXhosa / Xhosa	South Africa	xh-ZA
isiZulu / Zulu	South Africa	zu-ZA
Italian	Italy	it-IT
Italian	Switzerland	it-CH
Japanese	Japan	ja-JP
Kannada (Kannada Script)	India	kn-IN
Kazakh	Kazakhstan	kk-KZ
Khmer	Cambodia	kh-KH
K'iche	Guatemala	qut-GT
Kinyarwanda	Rwanda	rw-RW
Konkani	India	kok-IN
Korean	Korea	ko-KR

Language	Locale	Language tag
Kyrgyz	Kyrgyzstan	ky-KG
Lao	Lao PDR	lo-LA
Latvian	Latvia	lv-LV
Lithuanian	Lithuania	lt-LT
Lower Sorbian	Germany	wee-DE
Lule Sami	Norway	smj-NO
Lule Sami	Sweden	smj-SE
Luxembourgish	Luxembourg	lb-LU
Macedonian (Macedonia, FYRO)	Macedonia, former Yugoslav Republic of	mk-MK
Malay	Brunei	ms-BN
Malay	Malaysia	ms-MY
Malayalam (Malayalam Script)	India	ml-IN
Maltese	Malta	mt-MT
Maori	New Zealand	mi-NZ
Mapudungun	Chile	arn-CL
Marathi	India	mr-IN
Mohawk	Mohawk	moh-CA
Mongolian (Cyrillic)	Mongolia	mn-MN
Mongolian (Mongolian)	PRC	mn-CN-Mong
Nepali	Federal Democratic Republic of Nepal	ne-NP
Northern Sami	Finland	se-FI
Northern Sami	Norway	se-NO
Northern Sami	Sweden	se-SE
Norwegian (Bokmål)	Norway	nb-NO
Norwegian (Nynorsk)	Norway	nn-NO
Occitan	France	oc-FR
Odia (Odia Script)	India	or-IN
Pashto	Afghanistan	ps-AF

Language	Locale	Language tag
Persian	Iran	fa-IR
Polish	Poland	pl-PL
Portuguese	Brazil	pt-BR
Portuguese	Portugal	pt-PT
Punjabi (Gurmukhi Script)	India	pa-IN
Quechua	Bolivia	quz-BO
Quechua	Ecuador	quz-EC
Quechua	Peru	quz-PE
Romanian	Romania	ro-RO
Romansh	Switzerland	rm-CH
Russian	Russia	ru-RU
Sakha	Russia	sah-RU
Sanskrit	India	sa-IN
Serbian (Cyrillic)	Bosnia and Herzegovina	sr-BA-Cyrl
Serbian (Cyrillic)	Serbia	sr-SP-Cyrl
Serbian (Latin)	Bosnia and Herzegovina	sr-BA-Latn
Serbian (Latin)	Serbia	sr-SP-Latn
Sesotho sa Leboa / Northern Sotho	South Africa	ns-ZA
Setswana / Tswana	South Africa	tn-ZA
Sinhala	Sri Lanka	si-LK
Skolt Sami	Finland	sms-FI
Slovak	Slovakia	sk-SK
Slovenian	Slovenia	sl-SI
Southern Sami	Norway	sma-NO
Southern Sami	Sweden	sma-SE
Spanish	Argentina	es-AR
Spanish	Bolivia	es-BO
Spanish	Chile	es-CL

Language	Locale	Language tag
Spanish	Columbia	es-CO
Spanish	Costa Rica	es-CR
Spanish	Dominican Republic	es-DO
Spanish	Ecuador	es-EC
Spanish	El Salvador	es-SV
Spanish	Guatemala	es-GT
Spanish	Honduras	es-HN
Spanish	Mexico	es-MX
Spanish	Nicaragua	es-NI
Spanish	Panama	es-PA
Spanish	Paraguay	es-PY
Spanish	Peru	es-PE
Spanish	Commonwealth of Puerto Rico	es-PR
Spanish	Spain	es-ES
Spanish	United States	es-US
Spanish	Uruguay	es-UY
Spanish	Venezuela	es-VE
Swahili	Kenya	sw-KE
Swedish	Finland	sv-FI
Swedish	Sweden	sv-SE
Syriac	Syria	syr-SY
Tajik (Cyrillic)	Tajikistan	tg-TJ-Cyrl
Tamazight (Latin)	Algeria	tmz-DZ-Latn
Tamil	India	ta-IN
Tatar	Russia	tt-RU
Telugu (Telugu Script)	India	te-IN
Thai	Thailand	th-TH
Tibetan	PRC	bo-CN

Language	Locale	Language tag
Turkish	Turkey	tr-TR
Turkmen	Turkmenistan	tk-TM
Uighur	PRC	ug-CN
Ukrainian	Ukraine	uk-UA
Upper Sorbian	Germany	wen-DE
Urdu	Pakistan	ur-PK
Uzbek (Cyrillic)	Uzbekistan	uz-UZ-Cyrl
Uzbek (Latin)	Uzbekistan	uz-UZ-Latn
Vietnamese	Viet Nam	vi-VN
Welsh	United Kingdom	cy-GB
Wolof	Senegal	wo-SN
Yi	PRC	ii-CN
Yoruba	Nigeria	yo-NG

<15> Section 2.6.47: Office Excel 2007 does not ignore the ancestor **CT_PivotHierarchy** element.

<16> Section 2.6.48: Office Excel 2007 does not ignore the ancestor **CT_CacheField** element.

<17> Section 2.6.63: Excel 2010 and Excel 2013 requires that the corresponding **ListItem** ([ISO/IEC29500-4:2016] section 14.4.2.36) be present.

<18> Section 2.6.65: Excel 2010 loads and roundtrips this value for scroll bars and spin boxes, but it does not support its functionality.

<19> Section 2.6.65: Excel 2010 requires that the corresponding **FmlaRange** ([ISO/IEC29500-4:2016] section 14.4.2.29) be present.

<20> Section 2.6.65: Excel 2010 and Excel 2013 ignore this attribute. This attribute is being deprecated.

<21> Section 2.6.65: This attribute is being deprecated in Excel 2010. Its functionality will be replaced with attribute **noThreeD**.

<22> Section 2.6.65: Excel 2010 loads and roundtrips this value, but it only supports its functionality for scroll bar form controls when run in a dialog box .

<23> Section 2.6.65: Excel 2010 does not support this attribute.

<24> Section 2.6.65: Excel 2010 does not support this attribute.

<25> Section 2.7.16: Excel 2010 uses this value only when the drop-down control is run in a dialog box, in all other cases the drop-down control behaves as a standard combo box.

7 Change Tracking

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

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

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

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

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

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

Section	Description	Revision class
2.3.6.1.3.2 Busy Error Types	New rich value type.	Minor
2.3.6.1.10 Web Image Type	Update to existing rich value type.	Minor

8 Index