

## [MS-WSSTS]:

# Windows SharePoint Services

---

### Intellectual Property Rights Notice for Open Specifications Documentation

- **Technical Documentation.** Microsoft publishes Open Specifications documentation for protocols, file formats, languages, standards as well as overviews of the interaction among each of these technologies.
- **Copyrights.** This documentation is covered by Microsoft copyrights. Regardless of any other terms that are contained in the terms of use for the Microsoft website that hosts this documentation, you may make copies of it in order to develop implementations of the technologies described in the Open Specifications and may distribute portions of it in your implementations using these technologies or your documentation as necessary to properly document the implementation. You may also distribute in your implementation, with or without modification, any schema, IDL's, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications.
- **No Trade Secrets.** Microsoft does not claim any trade secret rights in this documentation.
- **Patents.** Microsoft has patents that may cover your implementations of the technologies described in the Open Specifications. Neither this notice nor Microsoft's delivery of the documentation grants any licenses under those or any other Microsoft patents. However, a given Open Specification may be covered by Microsoft [Open Specification Promise](#) or the [Community Promise](#). If you would prefer a written license, or if the technologies described in the Open Specifications are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting [iplg@microsoft.com](mailto:iplg@microsoft.com).
- **Trademarks.** The names of companies and products contained in this documentation may be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights. For a list of Microsoft trademarks, visit [www.microsoft.com/trademarks](http://www.microsoft.com/trademarks).
- **Fictitious Names.** The example companies, organizations, products, domain names, e-mail addresses, logos, people, places, and events depicted in this documentation are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

**Reservation of Rights.** All other rights are reserved, and this notice does not grant any rights other than specifically described above, whether by implication, estoppel, or otherwise.

**Tools.** The Open Specifications do not require the use of Microsoft programming tools or programming environments in order for you to develop an implementation. If you have access to Microsoft programming tools and environments you are free to take advantage of them. Certain Open Specifications are intended for use in conjunction with publicly available standard specifications and network programming art, and assumes that the reader either is familiar with the aforementioned material or has immediate access to it.

**Preliminary Documentation.** This Open Specification provides documentation for past and current releases and/or for the pre-release version of this technology. This Open Specification is final documentation for past or current releases as specifically noted in the document, as applicable; it is preliminary documentation for the pre-release versions. Microsoft will release final documentation in connection with the commercial release of the updated or new version of this technology. As the documentation may change between this preliminary version and the final version of this technology, there are risks in relying on preliminary documentation. To the extent that you incur additional

development obligations or any other costs as a result of relying on this preliminary documentation, you do so at your own risk.

Preliminary

## Revision Summary

Date	Revision History	Revision Class	Comments
4/4/2008	0.1		Initial Availability
6/27/2008	1.0	Major	Revised and edited the technical content
12/12/2008	1.01	Editorial	Revised and edited the technical content
7/13/2009	1.02	Major	Revised and edited the technical content
8/28/2009	1.03	Editorial	Revised and edited the technical content
11/6/2009	1.04	Editorial	Revised and edited the technical content
2/19/2010	2.0	Major	Updated and revised the technical content
3/31/2010	2.01	Editorial	Revised and edited the technical content
4/30/2010	2.02	Editorial	Revised and edited the technical content
6/7/2010	2.03	Editorial	Revised and edited the technical content
6/29/2010	2.04	Minor	Clarified the meaning of the technical content.
7/23/2010	2.05	Editorial	Changed language and formatting in the technical content.
9/27/2010	2.05	No Change	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	2.05	No Change	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	2.05	No Change	No changes to the meaning, language, or formatting of the technical content.
3/18/2011	2.5.1	Editorial	Changed language and formatting in the technical content.
6/10/2011	2.5.1	No Change	No changes to the meaning, language, or formatting of the technical content.
1/20/2012	3.0	Major	Significantly changed the technical content.
4/11/2012	3.0	No Change	No changes to the meaning, language, or formatting of the technical content.
7/16/2012	3.0	No Change	No changes to the meaning, language, or formatting of the technical content.
9/12/2012	3.0	No Change	No changes to the meaning, language, or formatting of the technical content.
10/8/2012	3.1	Minor	Clarified the meaning of the technical content.
2/11/2013	3.1	No Change	No changes to the meaning, language, or formatting of the technical content.
7/30/2013	3.2	Minor	Clarified the meaning of the technical content.
11/18/2013	3.2	No Change	No changes to the meaning, language, or formatting of the technical content.
2/10/2014	3.2	No Change	No changes to the meaning, language, or formatting of the

<b>Date</b>	<b>Revision History</b>	<b>Revision Class</b>	<b>Comments</b>
			technical content.
4/30/2014	3.3	Minor	Clarified the meaning of the technical content.
7/31/2014	3.3	No Change	No changes to the meaning, language, or formatting of the technical content.
8/24/2015	4.0	Major	Significantly changed the technical content.

Preliminary

# Table of Contents

<b>1</b>	<b>Introduction</b>	<b>8</b>
1.1	Glossary	8
1.2	References	11
1.2.1	Normative References	11
1.2.2	Informative References	12
1.3	Overview	12
1.4	Relationship to Protocols and Other Structures	12
1.5	Applicability Statement	12
1.6	Versioning and Localization	12
1.7	Vendor-Extensible Fields	12
<b>2</b>	<b>Structures</b>	<b>14</b>
2.1	Abstract Data Structures	14
2.1.1	Administration and Configuration	14
2.1.1.1	Farm	14
2.1.1.2	Administration Object	15
2.1.1.3	Service	15
2.1.1.3.1	Content Web Service Object	15
2.1.1.3.2	Administration Web Service Object	15
2.1.1.4	Web Application	15
2.1.2	Content	16
2.1.2.1	Namespace	16
2.1.2.2	Managed Path	17
2.1.2.3	Folder	17
2.1.2.4	File	17
2.1.2.5	Site Collection	17
2.1.2.6	Site	18
2.1.2.7	List	18
2.1.2.7.1	Document Library	19
2.1.2.7.2	UserInfo List	19
2.1.2.8	Content Type	19
2.1.2.8.1	Content Type Id	19
2.1.2.9	Field	19
2.1.2.9.1	Field Type and Field Internal Type	20
2.1.2.10	List Item	20
2.1.2.11	Document	20
2.1.2.11.1	Document Processes	21
2.1.2.11.1.1	Publishing Level	21
2.1.2.11.1.2	Versioning	21
2.1.2.11.1.3	Checking In and Out	21
2.1.2.11.1.4	Conversion	22
2.1.2.12	Generic List Items	22
2.1.2.13	Metadict	22
2.1.2.14	Workflow	22
2.1.2.14.1	Workflow Template	22
2.1.2.14.2	Workflow Associations	23
2.1.2.15	HTML User Interface Infrastructure	23
2.1.2.15.1	Page	23
2.1.2.15.2	Web Part	23
2.1.2.15.3	View	23
2.1.2.15.4	Form	23
2.1.2.16	Navigation Structure	23
2.1.2.16.1	Navigation Nodes	24
2.1.2.16.2	Navigation Node Identifiers	24
2.1.3	Provisioning Data Structures	24

2.1.3.1	Site Definition.....	24
2.1.3.2	List Definition .....	25
2.1.3.3	Feature.....	25
2.1.4	Authentication and Security .....	25
2.1.4.1	Authentication System.....	26
2.1.4.1.1	Authentication System User.....	26
2.1.4.1.2	Authentication System Group.....	26
2.1.4.2	Principal.....	26
2.1.4.3	Group.....	26
2.1.4.4	Securable Object .....	26
2.1.4.5	Scope.....	26
2.1.4.6	Permission .....	27
2.1.4.7	Read My Own, Write My Own.....	27
2.1.4.8	Role Definition.....	27
2.2	Object-Level Constraints and Requirements.....	27
2.2.1	File System Object Constraints .....	27
2.2.2	Site Constraints.....	27
2.3	Field Types.....	28
2.3.1	Base Field Types.....	28
2.3.2	Extended Field Types .....	30
2.4	Common Fields .....	30
2.4.1	Document Lookup.....	30
2.4.2	Base Data Fields.....	30
2.4.3	Base Rendering Fields .....	34
2.4.4	XML Document Data Fields .....	34
2.4.5	XML Document Rendering Fields.....	35
2.4.6	Survey Data Fields.....	35
2.5	List Base Types.....	35
2.5.1	Common List Item Fields .....	36
2.5.1.1	Data Fields.....	36
2.5.1.2	HTML Rendering Fields.....	37
2.5.2	Generic List.....	37
2.5.2.1	Data Fields.....	38
2.5.2.2	HTML Rendering Fields.....	38
2.5.3	Document.....	38
2.5.3.1	Data Fields.....	38
2.5.3.2	HTML Rendering Fields.....	39
2.5.4	Discussion Board .....	40
2.5.4.1	Data Fields.....	40
2.5.4.2	HTML Rendering Fields.....	40
2.5.5	Survey .....	41
2.5.5.1	Data Fields.....	41
2.5.5.2	HTML Rendering Fields.....	42
2.5.6	Issue .....	42
2.5.6.1	Data Fields.....	42
2.5.6.2	HTML Rendering Fields.....	43
2.6	Content Types .....	43
2.6.1	Base Content Types .....	43
2.6.1.1	System .....	43
2.6.1.2	Item.....	44
2.6.1.3	Document .....	44
2.6.1.4	Folder.....	44
2.7	List Template Types .....	45
2.8	Common Data Structures and Enumerations.....	46
2.8.1	WorkflowEventType Enumeration.....	46
2.8.2	WorkflowStatus .....	46
2.9	Expressions.....	47
2.9.1	Syntax .....	47

2.9.2	Function Names.....	48
<b>3</b>	<b>Structure Examples .....</b>	<b>54</b>
<b>4</b>	<b>Security .....</b>	<b>56</b>
4.1	Security Considerations for Implementers .....	56
4.2	Index of Security Fields .....	56
<b>5</b>	<b>Appendix A: Product Behavior .....</b>	<b>57</b>
<b>6</b>	<b>Change Tracking.....</b>	<b>59</b>
<b>7</b>	<b>Index.....</b>	<b>61</b>

Preliminary

# 1 Introduction

The Windows SharePoint Services contain common definitions and data structures that are used in various protocols in the set of protocols. This document also specifies high-level SharePoint concepts necessary for understanding those protocols. The documentation for individual protocols contains references to this document, as needed.

Sections 1.7 and 2 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in [\[RFC2119\]](#). All other sections and examples in this specification are informative.

## 1.1 Glossary

The following terms are specific to this document:

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

**access control list (ACL):** A list of access control entries (ACEs) that collectively describe the security rules for authorizing access to some resource; for example, an object or set of objects.

**alternate access mapping:** A mapping of URLs to web applications. Incoming alternate access mappings are used to provide multiple URL entry points for the same set of content. Outgoing alternate access mappings are used to ensure that content is rendered in the correct URL context.

**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 [\[RFC5234\]](#).

**base field type:** An XML-based schema that defines the type of data, such as formatted text or an integer, that can be entered and stored in a field in a **list**. Every field in a **list** is derived from a specific base field type.

**base type:** An XML-based schema that defines the data and rendering fields that can be used in a **list**. Every list is derived from a specific base type.

**base URL:** A URL that is specified for a web resource to convert all relative URLs in that resource to **absolute URLs**. A base URL ends with either a file name, such as <http://www.example.com/sample.htm>, or a slash, such as <http://www.example.com/subdir/>. See also **absolute URL**.

**computed field:** A field that can perform data manipulation and display functions by using the contents of other fields.

**content database:** A database that is stored on a back-end database server and contains stored procedures, site collections, and the contents of those site collections.

**content type:** A named and uniquely identifiable collection of settings and fields that store metadata for individual items in a SharePoint list. One or more content types can be associated with a list, which restricts the contents to items of those types.

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

**content type schema:** An XML definition that describes the contents of a **content type**.



**current version:** The latest version of a document that is available to a user, based on the permissions of the user and the publishing level of the document.

**directory name:** A segment of a **store-relative URL** that refers to a directory. A directory name is everything that appears before the last slash in a store-relative form URL.

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

**Document Workspace site:** A SharePoint site that is based on a Document Workspace site template and has a template identifier value of "1". A Document Workspace site is used for planning, posting, and working together on a document or a set of related documents.

**farm:** A group of computers that work together as a single system to help ensure that applications and resources are available. Also referred to as server farm.

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

**field internal name:** A string that uniquely identifies a field in a content type or a SharePoint list.

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

**file:** A single, discrete unit of content.

**folder:** A file system construct. File systems organize a volume's data by providing a hierarchy of objects, which are referred to as folders or directories, that contain files and can also contain other folders.

**front-end web server:** A server that hosts webpages, performs processing tasks, and accepts requests from protocol clients and sends them to the appropriate back-end server for further processing.

**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).

**group:** A named collection of users who share similar access permissions or roles.

**item identifier:** An integer that uniquely identifies an item in a SharePoint list.

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

**list identifier:** A GUID that is used to identify a **list** in a site collection.

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

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

**major version:** An iteration of a software component, document, or list item that is ready for a larger group to see, or has changed significantly from the previous major version. For an item on a SharePoint site, the **minor version** is always "0" (zero) for a major version.

**Meeting Workspace site:** A SharePoint site that is based on a Meeting Workspace site template and has a template ID value of "2". A Meeting Workspace site is used for planning, posting, and working together on meeting materials.

**metadict:** A dictionary that has strongly typed values.

**minor version:** An iteration of a software component, document, or list item that is in progress or has changed only slightly from the previous version. For an item on a SharePoint site, the minor version number is never "0" (zero) and is incremented for each new version of an item, unless a **major version** is explicitly published. When minor versioning is disabled on a SharePoint site, only major version numbers are incremented, and the minor version is always "0" (zero).

**navigation node:** An element in the navigational structure of a site. The element is a link or a series of links to a specific page in the site.

**navigation node element identifier:** An integer that identifies a navigation node. This value is unique for every navigation node in the navigational structure of a SharePoint site.

**principal:** An authenticated entity that initiates a message or channel in a distributed system.

**ProgID:** An identifier that is used by the Windows registry to uniquely identify an object and is in the form OLEServerName.ObjectName, for example, "Excel.Sheet" or "PowerPoint.Slide."

**publishing level:** An integer that is assigned to a document to indicate the publishing status of that version of the document.

**role definition:** A named set of permissions for a SharePoint site. See also permission level.

**securable object:** An object that can have unique security permissions associated with it.

**security scope:** A tree structure of objects in which every object has the same security settings as the root.

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

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

**site collection:** A set of websites (1) that are in the same **content database**, have the same owner, and share administration settings. A site collection can be identified by a **GUID** or the **URL** of the top-level site for the site collection. Each site collection contains a top-level site, can contain one or more subsites, and can have a shared navigational structure.

**site definition:** A family of site definition configurations. Each site definition specifies a name and contains a list of associated site definition configurations.

**site identifier:** A GUID that is used to identify a site in a **site collection**.

**site template:** An XML-based definition of site settings, including formatting, lists, views, and elements such as text, graphics, page layout, and styles. Site templates are stored in .stp files in the content database.

**store-relative URL:** A URL that consists only of a path segment and does not include the leading and trailing slash.

**SystemID:** A binary identifier that is used to uniquely identify a security principal (2). For Windows integrated authentication, it is a security identifier (SID). For an ASP.NET Forms Authentication provider, it is the binary representation that is derived from a combination of the provider name and the user login name.

**uncustomized:** A condition of a document whose content is stored in a location other than the content database. If a document is uncustomized, the front-end web server determines the location of the content by using the SetupPath value for the document. Also referred to as ghosted.

**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 [\[RFC1738\]](#).

**user interface (UI) version:** A single 4-byte integer that stores the version number that appears as a document version number in the user interface. The lower 9 bits correspond to the minor version number of the displayed version. The remaining 23 bits correspond to the major version number of the displayed version. See also displayed version.

**web application:** A container in a configuration database that stores administrative settings and entry-point **URLs** for **site collections**.

**Web Part:** A reusable component that contains or generates web-based content such as XML, HTML, and scripting code. It has a standard property schema and displays that content in a cohesive unit on a webpage. See also Web Parts Page.

**Web Part zone:** A structured HTML section of a Web Parts Page that contains zero or more Web Parts and can be configured to control the organization and format of those Web Parts.

**XML document:** A document object that is well formed, as described in [\[XML\]](#), and might be valid. An XML document has a logical structure that is composed of declarations, elements, comments, character references, and processing instructions. It also has a physical structure that is composed of entities, starting with the root, or document, entity.

**XML Path Language (XPath):** A language used to create expressions that can address parts of an XML document, manipulate strings, numbers, and Booleans, and can match a set of nodes in the document, as specified in [\[XPATH\]](#). XPath models an XML document as a tree of nodes of different types, including element, attribute, and text. XPath expressions can identify the nodes in an XML document based on their type, name, and values, as well as the relationship of a node to other nodes in the document.

**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](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information.

[ISO/IEC29500-1:2011] ISO/IEC, "Information Technology -- Document description and processing languages -- Office Open XML File Formats -- Part 1: Fundamentals and Markup Language Reference", ISO/IEC 29500-1:2011, 2011, [http://www.iso.org/iso/iso\\_catalogue/catalogue\\_tc/catalogue\\_detail.htm?csnumber=59575](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=59575)

[MS-FPSE] Microsoft Corporation, "[FrontPage Server Extensions Remote Protocol](#)".

[MS-WSSCAML] Microsoft Corporation, "[Collaborative Application Markup Language \(CAML\) Structure](#)".

[MS-WSSFO3] Microsoft Corporation, "[Windows SharePoint Services \(WSS\): File Operations Database Communications Version 3 Protocol](#)".

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

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

[RFC3986] Berners-Lee, T., Fielding, R., and Masinter, L., "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005, <http://www.ietf.org/rfc/rfc3986.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>

[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/>

## 1.2.2 Informative References

[MSDN-SharePointSDK] Microsoft Corporation, "SharePoint Products and Technologies SDK: 2010 API Reference (Technical Preview)", July 2009, [http://msdn.microsoft.com/en-us/library/ee557253\(office.14\).aspx](http://msdn.microsoft.com/en-us/library/ee557253(office.14).aspx)

## 1.3 Overview

This document describes the fundamental relationships and requirements that apply to several structures in a SharePoint Server implementation. It describes common object-level constraints and provides foundational requirements that explain behavior in the SharePoint family of protocols.

SharePoint Server is fundamentally divided into a set of administration objects that represent units of administration in a SharePoint implementation and a set of objects that represent content stored in the SharePoint infrastructure. Content is stored in one or more **site collections**. A site collection represents settings and data for a customer or scenario and contains a hierarchy of **sites**, **lists**, and **folders**. Each site represents an instance of a collection used to meet a customer need—for example, a team site or an Intranet portal—and contains **lists**, files, and folders.

## 1.4 Relationship to Protocols and Other Structures

This set of data structures defines concepts and requirements to be implemented and upheld for the set of SharePoint Server protocols.

## 1.5 Applicability Statement

This infrastructure outlines the fundamental data structures and concepts used in the SharePoint Server protocols and it can be used for further understanding of related protocols, as well as provide additional details on restrictions used with various data structures.

## 1.6 Versioning and Localization

None.

## 1.7 Vendor-Extensible Fields

Many structures defined here can host additional data for a vendor. Sites, folders, **list items**, and **files** all support additional custom properties through the **metadict** infrastructure. Administration objects also support custom properties that can contain vendor-specific data. Additionally, list

structures in SharePoint Server are inherently extensible, and vendors can add **fields** to store custom data.

**Content types** can have multiple arbitrary **XML documents** associated with them. Vendors can store additional data with a content type by defining and associating their own XML documents in their own namespace.

Preliminary

## 2 Structures

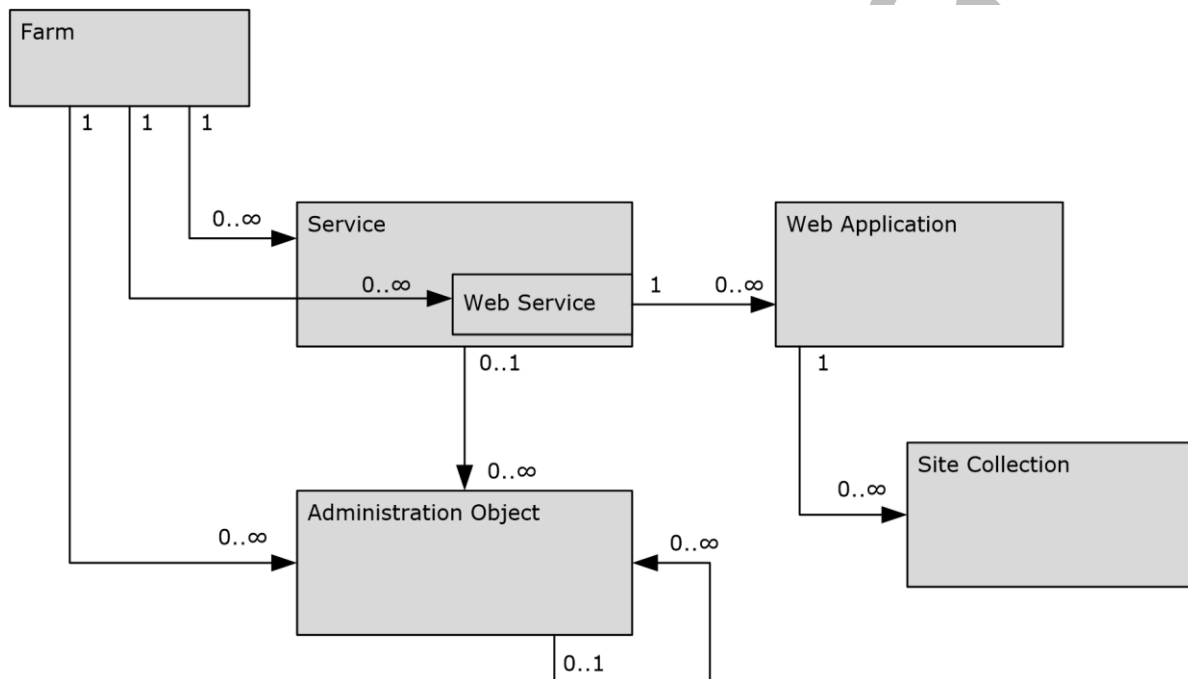
This section discusses data structures that are used by protocols in the set of SharePoint Server protocols.

### 2.1 Abstract Data Structures

The following section describes abstract data structures and explains how dependent protocols behave in a SharePoint Server implementation. For more information about the details of this model, see [\[MSDN-SharePointSDK\]](#). This document does not mandate that implementations implement these data structures in a similar way, as long as their external behavior is consistent with the behavior described in this document and in other protocol documents about the SharePoint protocols.

#### 2.1.1 Administration and Configuration

The administration feature of a SharePoint Server implementation contains settings that define the infrastructure and operation of a SharePoint implementation. The configuration is shown in the following diagram.



**Figure 1: Overview of management and configuration data for a farm**

##### 2.1.1.1 Farm

The broadest container of a SharePoint Server protocol server is the **farm**. Any SharePoint Server protocol installation is defined by the presence of exactly one farm. A farm implementation can encompass one or more physical computers.

A farm represents a collection of administration objects (see section [2.1.1.2](#)) that function together, as well as a collection of service objects that provide centralized management of the capabilities of a farm.

One special type of service object is known as a Web service object, which specifies central settings for hosting content. A Web service object serves as the top-level container for user content that is hosted in a SharePoint Server implementation. A farm has one content Web service object and one administration Web service object. A farm also has several properties associated with it, which contain settings that apply to all objects in the farm.

### 2.1.1.2 Administration Object

Administration objects govern the configuration of a farm and provide object hierarchies for administering both the virtual and physical configurations of the farm.

Administration objects are defined according to an administration object type. An administration object type defines the schema for an administration object, as well as providing a set of defined operations. Administration object types define the base properties of an administration object, as well as the relationships to other administration object types, such as a parent-child relationship between administration object types.

An administration object has a **GUID** identifier.

Administration objects have additional properties that specify individual settings as defined by the administration object type, as well as a collection of additional custom properties that can be associated with the object.

Administration objects can also have a collection of child administration objects, as defined by the schema of the administration object type. An administration object has a parent administration object, unless the object is the farm.

New administration object types and instances of those administration object types can be added to the farm or to a Web service object as new subsystems are added to an implementation. For example, one administration object describes settings for antivirus scanning of content in the farm, or a hierarchy of administration objects can be used to specify document conversion settings and installed document converters.

### 2.1.1.3 Service

A service is a logical component that specifies a facility provided by the farm. Service facilities can be used by other components in the farm.

#### 2.1.1.3.1 Content Web Service Object

The content Web service contains content and settings that apply to Web applications that are hosted on behalf of customers of the SharePoint Server implementation.

#### 2.1.1.3.2 Administration Web Service Object

The administration Web service object contains content that hosts the user interface for administrators who configure the SharePoint Server infrastructure.

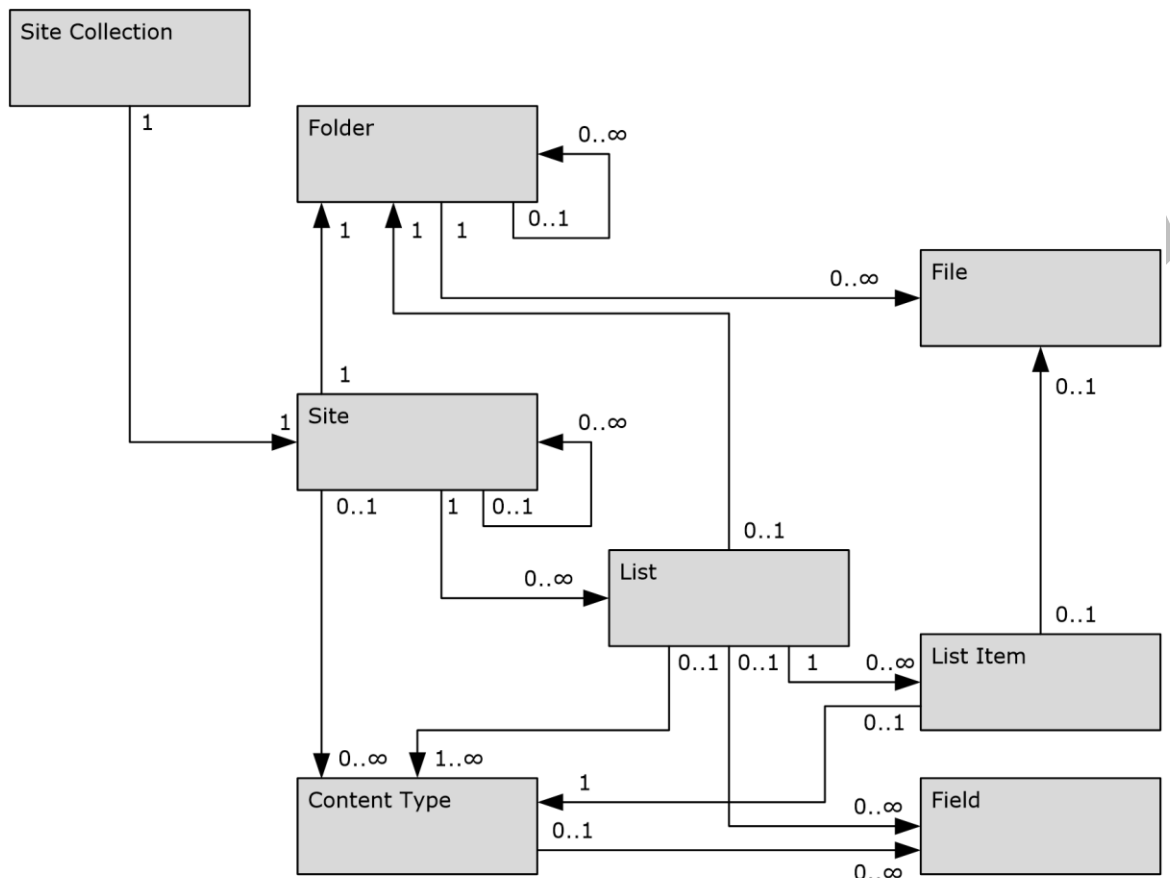
### 2.1.1.4 Web Application

A **web application** contains a collection of site collections. It also contains settings for administrators that govern the usage of those site collections. A Web application is a type of administration object and inherits the object attributes and properties.

A Web application has at least one server **base URL** registered, which defines a **URL** entry point for that Web application. A Web application can have additional **alternate access mappings**, which describe additional server base URLs that can be used to access a site.

## 2.1.2 Content

Content in a SharePoint Server implementation can be expressed as a namespace hierarchy. From this perspective, a SharePoint implementation consists of folders and files that are stored hierarchically, with a root folder and descendent folders and files. Some folders in the hierarchy have associated site or list objects that define additional behavior and settings. A root site, which is paired with a root folder, has subsites and lists. Each subsite and list has one corresponding folder, as shown in the following diagram.



**Figure 2: Overview of content data for a farm**

### 2.1.2.1 Namespace

A namespace in a protocol server represents a hierarchy of paths that are expressed using standard URL constructs as specified in [RFC2396](#) and [RFC3986](#). Each segment in a URL is separated by a slash (/). For example, in "http://server/myfolder", there are two segments: /server and /myfolder. These segments can come from multiple sources, as follows:

- **Base server URL:** In a protocol server, the base server URL represents a URL entry point. A base server URL consists of a scheme, as well as an authority, as specified in [RFC2396].
- **Managed path:** Managed paths provide structures for organizing multiple site collections in a hierarchy, along with other custom content.
- **Site collection folder structure:** A site collection has a folder hierarchy that contains sites, lists, and folders.



### 2.1.2.2 Managed Path

A managed path specifies a location in a URL namespace in which new site collections can be created. Two types of managed paths are supported: explicit managed paths and wildcard managed paths.

An explicit managed path defines a set of one or more folder names, where the folder name of the leaf child node that has no child objects of its own represents the root folder of a new site collection. For example, in `http://myserver/content/site`, the explicit managed path would be `/content/site`, where `site` is the root folder of a site collection, and `content` is a folder that can have custom content associated with it.

Another type of managed path is a wildcard managed path. Every child node of the leaf in a wildcard managed path is a root folder of a SharePoint Server site collection. For example, in `http://myserver/sites/customsite`, `sites` represents the leaf for a wildcard managed path. Every child node (in this case, `customsite`) is the root folder of a site collection.

A managed path can contain other managed paths. For example, `http://myserver/content/site` might have a slash (/) as an explicit managed path and `/sites` as a wildcard managed path. If so, the slash (/) would host a site collection at the root of the server, and `/sites/customsite` would host a different site collection.

### 2.1.2.3 Folder

A folder is a container of other folders and files in a SharePoint Server protocol hierarchy.

A folder has a collection of files and a collection of subfolders. A folder is either the root folder of the root site in a site collection or a folder that has a parent folder.

A folder has an associated metadict (see section [2.1.2.13](#)), which contains additional properties of the folder. A list of common metadict properties is specified in [\[MS-FPSE\]](#) section 2.2.4.

A folder **MUST** also have properties that conform to the set of constraints outlined in **File System Object Constraints** (section [2.2.1](#)).

### 2.1.2.4 File

A file has at least one associated binary stream, which contains the contents of a file.

A file also has one associated metadict, which contains properties of the file.

A file can have an underlying template defined on the **front-end web server**. When a file has an underlying template, the file is said to be **uncustomized**, and the content of the file is not stored in the **content database**. Any change to the file "customizes" that file; that is, makes the contents of the file no longer match the template. For template-based files, a protocol server supports an operation to revert a file back to its template, that is, to reset the contents of a file back to its base version.

A file **MUST** also have properties that conform to the set of constraints outlined in **File System Object Constraints**, as specified in section [2.2.1](#).

### 2.1.2.5 Site Collection

A site collection describes a container of a hierarchy of sites. In addition, a site collection contains settings specified by the site administrator that govern the behavior of the site collection. A site collection is stored in one content database.

A site collection has flags that define the behavior of the site collection. These flags are specified in [\[MS-WSSFO3\]](#) section 2.2.2.9 .

A site collection has one root site (2). The root site (2) of a site collection can have additional settings and data that apply to all sites (2) in the site collection. The root site (2) can also contain catalogs, that is, one or more lists that function to store data and settings for the entire site collection.

### 2.1.2.6 Site

A site represents a collection of content organized to address a consumer need.

A site is created from a **site definition** or from a **site template** that contains a set of changes that are stored as a set of differences from the site definition. A site has a collection of activated features, which describe additional components that extend the functionality of the site.

A site (2) is either the root site (2) of a site collection, or it has a parent site (2) in the same site collection. A site (2) MUST be associated with a folder that is a descendent of the folder associated with its parent site (2). However, there MAY be folders with no associated site (2) in the folder hierarchy between a site (2) and its parent site.

A site has an associated folder, as specified in section [2.1.2.3](#), that defines the URL of the site (2).

A site has flags and other metadata that define the behavior of the site. These flags are documented in [\[MS-WSSFO3\]](#) section 2.2.2.11.

A site (2) contains a collection of subsites and a collection of lists.

A site MUST also have properties that conform to the set of constraints specified in Site Constraints in section [2.2.2](#).

### 2.1.2.7 List

A list is a container for list items. A list specifies a schema that applies to items in the list, and the schema defines a collection of fields that apply to the list.

A list is derived from one list **base type** and contains all fields defined by that base type. The list of base types is specified in **List Base Types**, as specified in section [2.5](#).

A list that has a base type of 1 has one file associated with every list item stored in the list. Such a list is called a **document library**. A document library has additional special semantics, which are described in **Document Library** in section [2.1.2.7.1](#).

A list is created from a list definition, as defined in section [2.1.3.2](#), which defines the underlying initial structure of fields (2), content types, forms, and views.

A list has one or more content types, as specified in section [2.1.2.8](#), which define sets of schema and behaviors for items.

A list can have a folder hierarchy, which organizes content in a list. A folder can have an associated list item, which tracks schema and behaviors. Other folders can be hidden in the list. One example is the Forms folder in a document library, which groups form pages.

A list can be connected to an external data source. This type of list is known as an external list. For an external list, all underlying data for the list is not stored in a content database, but is retrieved from an external data store using connection information defined on the protocol server. An external list is derived from the **Generic List** base type and inherits its behaviors.

A list has a collection of views, which describe filters and display preferences for viewing items in a list.

A list has a GUID, as well as a title made up of zero to 255 characters.

In addition, a list has metadata properties that define the behavior of items in the list, as well as services that are provided for the list. For example, the **Description** metadata property provides additional user-supplied text that describes the list.

Finally, a list has various settings that are determined by list flags. For a complete list of common flags, see [\[MS-WSSFO3\]](#) section 2.2.2.5.

### 2.1.2.7.1 Document Library

A document library is a list in which each list item has a corresponding file stored as a descendent of the document library folder; that is, each list item (section [2.1.2.10](#)) is a document (section [2.1.2.11](#)).

A document library supports optional check-in and check-out processes for documents, as well as major and minor versioning functionality for documents. See **Document Processes** (section [2.1.2.11.1](#)).

### 2.1.2.7.2 UserInfo List

A **UserInfo** list is a specialized type of list that tracks both basic and custom user data. Items in the **UserInfo** list are managed by the system and contain one list item for every authenticated user who has modified data on a site or to whom tasks have been assigned.

The root site of a site collection has its own **UserInfo** list. As in other lists, the **UserInfo** list supports adding columns.

### 2.1.2.8 Content Type

A content type specifies a schema and a set of behaviors for list items in a site collection. A site has a collection of content types that can be applied to lists in the site, as well as propagated to subsites. A list has one or more associated content types that can be used for list items. A list item has only one specified content type.

A content type derives from a parent content type. The exception to this is the System Content Type (0x), which does not derive from any other content type and forms the basis of the inheritance hierarchy. Default content types are described in **Content Types** (section [2.6](#)).

A content type has a specific form of identifier that identifies not only the content type, but also its inheritance hierarchy. The structure of the **content type identifier** is described in **Content Type ID** (section [2.1.2.8.1](#)).

A content type also has a collection of XML documents that define extensions and customizations to the content type.

#### 2.1.2.8.1 Content Type Id

The **ContentTypeId** type is the identifier for the specified content type. The identifier is a string of hexadecimal characters. The identifier **MUST** be unique relative to the current site collection and site and **MUST** follow the pattern of prefixing a **ContentTypeId** with its parent **ContentTypeId**.

**ContentTypeId** **MUST** follow the XSD pattern specified in [\[MS-WSSCAML\]](#) section 2.3.1.4.

### 2.1.2.9 Field

A field is an element of a list or **content type schema** that specifies a property that is tracked for a list item.

A field has an internal name, which specifies an identifier for the field. A **field internal name** is unique among other fields in a list and cannot contain spaces.

A field has an identifier, which is a GUID.

A field has a specified **field type**. A field (2) also contains state information for settings and additional metadata specified by the field type.

### 2.1.2.9.1 Field Type and Field Internal Type

A field type specifies the format and semantics of a field.

Field types specify a collection of properties that define the semantics of the field (2). For example, the text field type has a maximum length attribute that defines the maximum number of characters that the text field (2) permits.

Some properties of a field relate to the behavior of the field at the data level (for example, a maximum number of characters), whereas other properties are related to the visual presentation of the field (for example, whether a **Choice** field is displayed as radio buttons or a dropdown list).

Field types have a hierarchy. A field type can derive from another field type, from which it inherits behavior and functionality. For example, the **UserMulti** field type derives from the **LookupMulti** field type, and therefore contains semantics for working with collections of user data.

Field types that do not derive from any other field types provide the foundation of schema functionality and are referred to as **base field types**. For field types that derive from another field type, the field (2) internal type corresponds to the base field type from which the field type inherits, either directly or indirectly.

A common set of field types is specified for an implementation. These field types are specified in **Field Types** (section [2.3](#)).

### 2.1.2.10 List Item

A list item is a collection of related properties that define a logical object.

A list item has only one parent list. A list item contains data for fields that are defined in the parent list, as well as additional custom properties that are defined through an associated metadict. A list of common metadict properties is specified in [\[MS-FPSE\]](#) section 2.2.4. A list item also contains metadata that defines additional behavior for the list item.

A list has an item index property, which specifies a unique index for the item in relation to the list. A list item can be represented only once in its parent list.

A list item has one specified content type. A list item has one property that specifies the content type identifier of the list item. A list item supports persistence of data for additional fields (2) in a list that are not specified by the content type of the list item.

A non-document list item is associated with a base document structure that contains core data for the list item, such as the metadict of custom properties. This base document structure does not contain a file stream or URLs that correspond to reserved locations in the namespace hierarchy. If a list item is stored in a document library, the list item has a full corresponding file. This type of list item is known as a document.

A list item can have a version history if version history tracking is turned on for the parent list. A version history consists of copies of the field (2) data of the list item that are stored as users make updates to a list item.

### 2.1.2.11 Document

A document is a special form of list item that has an association to one file. The associated file is located in a folder hierarchy that has the folder of the parent list of the list item as an ancestor.

Documents have a collection of document flags (**Doc Flags**) defined. These flags are specified in [\[MS-WSSFO3\]](#) section 2.2.2.3.

Documents have a flag that specifies the virus status of the document. This flag is specified in [\[MS-WSSFO3\]](#) section 2.2.1.2.17.

## 2.1.2.11.1 Document Processes

### 2.1.2.11.1.1 Publishing Level

A version of a document supports the following version levels:

- Published
- Draft
- Checked out

Support for draft versions is optional and configurable per library.

A protocol server tracks the publishing status of each version of a document with a **publishing level**. A published document has a **major version** number of 1 or higher and a minor version of 0. A draft document has a nonzero **minor version** number and a nonnegative major version number.

User permissions can be configured to grant some users the ability to read draft versions. Only a user who has checked out a document can read the checked-out version.

### 2.1.2.11.1.2 Versioning

A protocol server supports retention of multiple versions of a document over time.

In addition, an implementation supports a **current version** that differentiates which version is available to a user based on the publishing level of a document and that user's permissions.

A document under SharePoint Server version control can have as many as three versions that can be considered the current version. Which versions a user sees depends on the user's permissions, the publishing level of the document, and whether the user has the document checked out.

- A user with minimal permissions can view only the most recently published version of the document, which has a positive major version number and a minor version number of zero, if minor version numbering is enabled.
- A user with permission to see draft versions of the document can view the most recent checked-in draft version of the document. The right to see draft versions might be granted to any user who can read a document, to any user who can update a document, or only to list administrators and the user who authored the draft version, depending on the document library configuration.
- The user who has a document checked out is able to view the checked-out version, which has the next incremental version number after the most recent checked-in draft or published version.

All of these versions are considered the current version, even though only one is returned to a user as the current version when requested, depending on these criteria. Older versions are considered historical versions.

### 2.1.2.11.1.3 Checking In and Out

Documents support check-in and check-out operations. Checking out a document associates a user with a document and sets the publishing level of the document to checked out.

When a document is checked out, a standard item or file update operation can be performed only by the user who checked the document out. Updates to the file are not visible to other users until the

document is checked in. A checked-out document can also be reverted (that is, the check-out can be reversed.) Undoing a check-out reverts the document to its state before it was last checked out.

The checked-out version can also be checked in, which promotes its publishing level to draft if draft versions are enabled, promotes its publishing level to published if moderation is not required, or signals that it is ready for approval if the system is configured to require moderation approval to mark a document as published.

Documents have a flag that indicates whether the document is in a published, draft, or checked-out state. This flag is specified in [\[MS-WSSFO3\]](#) section 2.2.2.6, Publishing Level Type.

#### **2.1.2.11.1.4 Conversion**

Documents can also support a conversion operation. Based on the file type of a file, the file can be converted to a different format. If a file is converted, a new file is created that has a link to its original source file.

#### **2.1.2.12 Generic List Items**

A generic list item is a list item that is not a document; that is, a list item that does not have a visible file associated with it. Generic list items support a loose association to additional files stored for an item, known as attachments.

Attachments stored for an item are stored in a folder in the following location for an item.

```
<list root folder>/Attachments/<item identifier>
```

In addition, a list item has an additional field (2) named Attachments, which contains a Boolean flag that expresses whether an item has one or more attachments.

#### **2.1.2.13 Metadict**

A metadict is a dictionary with strongly typed values for storing additional properties for a file, folder, or site (2). A metadict contains a collection of properties.

The normalized structure of a metadict is specified in [\[MS-FPSE\]](#) section 2.2.2.2.11. See [\[MS-FPSE\]](#) section 2.2.4 for a description of common properties.

#### **2.1.2.14 Workflow**

A workflow represents a set of actions and conditions that can be performed on a list item in response to explicit or implicit starting actions.

A workflow association contains specific workflow start and metadata information that is used to determine the operation of a workflow, as well as conditions in which a workflow runs. A workflow association can be associated with a site (2), list, or content type.

A site (2) supports a collection of workflow templates, which contain properties and references to workflow implementations.

##### **2.1.2.14.1 Workflow Template**

A workflow template contains basic metadata needed to instantiate a workflow for a list.

A workflow template has an association data property, which contains custom information for the workflow implementation. A workflow template also contains information about the content type of tasks that track workflow requirements, default workflow autostart data, and other properties.

A workflow template also has a GUID that identifies the workflow template.

#### **2.1.2.14.2 Workflow Associations**

A workflow association describes interaction between a workflow and a content type or list. It describes how a workflow starts, as well as starting behaviors and properties.

A workflow association has a GUID. It also contains a **list identifier** for a list for tracking workflow history, as well as a list identifier for a list for tracking tasks associated with workflow instances.

#### **2.1.2.15 HTML User Interface Infrastructure**

Implementations of the set of SharePoint Server protocols define mechanisms for hosting user interfaces that enable users to interact with the data that they have stored in a site collection.

##### **2.1.2.15.1 Page**

A page is a type of file that renders a user interface for users. A page can have a collection of **Web Parts**, which are user-modifiable controls that can be moved within **Web Part zones**.

##### **2.1.2.15.2 Web Part**

A Web Part instance is a single component that resides on a page and can display data, visualizations, or some form of user interface. A connection is defined as a relationship between two Web Parts that are an agreed-upon interface, as well as additional metadata that corresponds to that connection. A Web Part can have zero or more connections to other Web Parts on the page.

A Web Part supports zero or more properties that can be modified to change how the Web Part behaves or renders. There are two groups of properties: those that can be customized and those that can be personalized. A property can be customized if all users who access the Web Part get the same value for the property. A property can be personalized if users who access the Web Part can modify the property to a value specific to each user.

##### **2.1.2.15.3 View**

A view is a description of a visualization of a list. A list supports a collection of views. A view has one associated Web Part instance (the view Web Part). Because a Web Part instance exists in the context of a page, a view therefore has an associated page.

A view has a collection of settings flags defined. These flags are specified in [\[MS-WSSFO3\]](#) section 2.2.2.13.

##### **2.1.2.15.4 Form**

A form provides a display and editing interface for a single list item. A form has one associated Web Part instance (a form Web Part). Because a Web Part instance exists in the context of a page, a form has an associated page.

A form has a collection of setting flags defined. These flags are specified in [\[MS-WSSFO3\]](#) section [2.2.2.13](#).

#### **2.1.2.16 Navigation Structure**

The **Navigation** structure is a hierarchical representation of some or all files (see section [2.1.2.4](#)) and folders (see section [2.1.2.3](#)) in the site collection, as well as their literal URL strings. Each element in the hierarchy is a **navigation node**. The purpose of the **Navigation** structure is to provide a way to define and render links to related URLs.



Every site (2) has one associated **Navigation** structure. The **Navigation** structure has one navigation node whose **navigation node element identifier** is zero. This is the root node of the hierarchical structure.

### 2.1.2.16.1 Navigation Nodes

There are two types of navigation nodes: type zero and type 1.

Type zero navigation nodes link to files or folders in the site collection that contains the site (2). These are automatically made visible or hidden when rendering the links, based on whether the files or folders are accessible to the user. Also, any changes to the URL of the file or folder are updated automatically for this type of navigation node. The navigation structure of a site (2) can only have one type zero navigation node pointing to a file or folder, unless the navigation node has its **ChildOfLinkBar** property set to 1.

Type 1 navigation nodes link to literal URL strings. A literal URL can point to files or folders in the site collection that contains the site (2), such as type zero navigation nodes, but they are treated as literal URLs to external Web sites and do not get the automatic behaviors described earlier for type zero navigation nodes.

Navigation nodes have the following properties that distinguish their behavior.

**LinkBar:** A navigation node that has this property set to 1 defines a set of related navigation nodes. Only type 1 navigation nodes can have this property set to 1. Child objects of such a navigation node can be of either type zero or type 1, and they have the **ChildOfLinkBar** property set to 1.

**ChildOfLinkBar:** This property is set to 1 for any navigation node whose parent has the **LinkBar** property set to 1.

**NonNavPage:** If this property is set to 1 on a navigation node, it is hidden when rendering the navigation node [<1>](#).

Navigation nodes can be created as part of site creation by specifying them in the site definition. Navigation nodes can be added, moved, or deleted later by a user who has the required permissions.

### 2.1.2.16.2 Navigation Node Identifiers

Each navigation node has a navigation node element identifier.

The following restrictions are enforced when using navigation node element identifiers:

- Navigation node element identifiers from zero through 999 are reserved and are used only as temporary values for adding new navigation nodes to the navigation structure. This identifier is translated to a valid value greater than 2000 when performing the add operation.
- Navigation node element identifiers from 1000 to 2000 can be used only to create navigation nodes from the site definition [<2>](#).

## 2.1.3 Provisioning Data Structures

### 2.1.3.1 Site Definition

A site definition specifies settings that are used when a new site (2) is created, as well as a set of features to activate. The structure of a site definition is specific to the implementation of the protocol server.

A site definition can contain the following:



- A set of pre-defined files to be provisioned.
- References to zero or more features that contain additional functionality for the site (2).

A site definition has a template identifier, which is an integer.

### 2.1.3.2 List Definition

A list definition specifies settings that are used when a new list is created. The structure of a list definition is specific to the implementation of the protocol server.

A list definition can contain the following:

- A set of pre-defined files to be provisioned.
- Field (2) definitions.
- Associated content type references.
- View definitions.
- Form definitions.

A list definition has an integer template identifier. A list definition can have a feature identifier, which specifies the feature that contains the list definition. If a list definition is defined for a feature and has a feature identifier, the scope of the containing feature MUST be set to "Web" or "Site".

### 2.1.3.3 Feature

A feature is a structured modular component that enables built-in or user-defined classes, objects, and definitions that extend the front-end web server.

Features have the following attributes:

**Scope:** Specifies how the feature applies to a site. A feature is scoped to one of the entities described in the following table.

Value	Description
Farm	Specifies that the elements of the feature apply to the entire farm, if the feature is activated.
Web Application	Specifies that the elements of the feature apply only to Web applications that have the feature activated.
Site	Specifies that the elements of the feature apply only to site collections that have the feature activated.
Web	Specifies that the elements of the feature apply only to sites (2) that have the feature activated.

**Id:** A GUID that identifies the feature.

### 2.1.4 Authentication and Security

A farm supports interoperability with at least one authentication system. The authentication system provides details on lists of users that are available to the farm and can also provide groupings of users. The authentication system is also responsible for requesting credentials from incoming users to identify and validate them.

A site collection in a farm can support users from one or more authentication systems.

### 2.1.4.1 Authentication System

An authentication system has a collection of authentication system users. An authentication system can also have a named group of authentication system users created to facilitate treating a set of users as a unit. These groups specify a list of users that belong to the group. The group also has an identifier.

#### 2.1.4.1.1 Authentication System User

An authentication system user has the following attributes:

**Id:** A consistent **SystemID** of the authentication system user that identifies the user.

**Name:** A name for the user.

#### 2.1.4.1.2 Authentication System Group

An authentication system group has the following attributes:

**Id:** Specifies a consistent identifier of the authentication system group.

**Name:** A name for the group.

#### 2.1.4.2 Principal

A **principal** represents either a single user or a group of users in the authentication system.

A principal has a unique identifier that defines the principal. In a site, a principal (1) also has a unique integer identifier that identifies the principal (1) in that site (2).

#### 2.1.4.3 Group

A site collection supports a collection of **groups**. A group is a list of named principals. A group can be assigned one or more roles, or given permissions explicitly, or both.

#### 2.1.4.4 Securable Object

A **securable object** is an object that can have unique or inherited permissions.

A protocol server implementation supports sites, lists, folders, and list items as securable objects. Additionally, files and folders associated with list items in a list are supported as securable objects. A Forms folder in a list has the same permissions as its containing list. An attachment file or a thumbnail file has the same permissions as the respective list item.

A file or folder outside a library has the same permissions as its containing site.

#### 2.1.4.5 Scope

A scope involves one or more nodes in the data hierarchy of protocol server sites, lists, folders, and list items that share the same set of permissions. A scope applies to hierarchical elements from only one site collection. If a node in the hierarchy of securable objects has the same scope as its parent (for example, a list that has the same scope as its parent site), that node is said to inherit the permissions of its parent. A child securable object has separate permissions from its parent if it has a different scope.

A scope has an associated collection of assignments of principals or groups to roles or explicit permissions known as an **access control list (ACL)**.

A scope is identified by GUID.

#### 2.1.4.6 Permission

A permission is a specific named right for a particular action or behavior. Permissions can be applicable to list items, folders, or sites. The set of rights is specified in the WSS Rights Mask structure in [\[MS-WSSFO3\]](#) section 2.2.2.15. For example, the **ViewListItems** right enables the specified user to view list items in a list.

#### 2.1.4.7 Read My Own, Write My Own

In addition to right- and role-based security, a list also has flags that enable a list to have either "read my own", or "write my own" security, or both. If a list has "read my own" security, users of a list can see only items that they have created. If a list has "write my own" security, users of a list can edit only items that they have created. A user with Manage List permissions can read items irrespective of **Read My Own** or **Write My Own** flags.

#### 2.1.4.8 Role Definition

A **role definition** is a collection of named rights. A role definition can be assigned directly to a principal (1) or to a group.

### 2.2 Object-Level Constraints and Requirements

#### 2.2.1 File System Object Constraints

A file system object is either a folder or a file.

A file system object **MUST** have a name between 1 and 128 characters in length that expresses the location of the file system object in the hierarchy.

A file system object name **MUST NOT** contain any of the following characters:

- ~
- #
- %
- &
- \*
- { }
- \
- :
- < >
- ?
- /
- |
- "

A file system object name **MUST NOT** begin or end with a period. A file system object name **MUST not** contain consecutive periods. A file system object name **MUST NOT** begin with leading whitespaces or end with trailing whitespaces as defined by the following: `character = 0x20` or `character > 0x09` and `character <= 0x0D`.

#### 2.2.2 Site Constraints

A site (2) **MUST** have a name property with the same fundamental constraints as its corresponding folder name. All restrictions of the folder name apply to the site name. In addition, the following constraints apply to site names only:

- They MUST NOT begin with an underscore (\_) character.
- They MUST NOT begin with a period (.) character.
- They MUST NOT contain a quotation mark (") character.
- They MUST NOT contain characters less than 0x20.

A site (2) has a **Title** property that provides a friendly name for the site. The site **Title** can be from 1 through 255 characters in length.

## 2.3 Field Types

### 2.3.1 Base Field Types

The following table describes the field types that are defined and used by the base types of a protocol server.

Field type name	Description
<b>AllDayEvent</b>	This field type is used only in conjunction with an Events list. TRUE if the item is an all-day event (that is, does not occur during a specific set of hours in a day).
<b>Attachments</b>	This field type describes whether one or more files are associated with the item. See <b>Attachments</b> in <b>Base Data Fields</b> (section <a href="#">2.4.2</a> ) for more information about attachments. TRUE if a list item has attachments, and FALSE if a list item does not have attachments.
<b>Boolean</b>	This field type can be set to TRUE or FALSE.
<b>Calculated</b>	This field type value is calculated based on the value of other columns.
<b>Choice</b>	This field type enables selection from a set of suggested values. A property on a choice field specifies whether values other than the suggested values are supported.
<b>Computed</b>	This field type renders output based on the value of other columns.
<b>ContentTypeId</b>	This field type contains a content type identifier for an item. <b>ContentTypeId</b> conforms to the structure defined in <b>Content Type Id</b> (section <a href="#">2.1.2.8.1</a> ).
<b>Counter</b>	This field type is a monotonically increasing integer field that has a unique value in relation to other values stored for the field in the list. This field is used only for the list <b>item identifier</b> field, and not intended for use elsewhere.
<b>CrossProjectLink</b>	This field type enables a link to a <b>Meeting Workspace site</b> .
<b>Currency</b>	This field type provides for currency-related data. This field has a <b>CurrencyLocaleId</b> property that takes the locale identifier of the desired currency.
<b>DateTime</b>	This field type enables full date and time values, as well as date-only values.
<b>Error</b>	Specifies errors.
<b>File</b>	Specifies a reference to a file to retrieve the contents of that file.

Field type name	Description
<b>GridChoice</b>	This field type enables specification of multiple number scales in a list.
<b>Geolocation</b>	This field type accepts location by longitude, latitude, and possibly altitude.
<b>Guid</b>	Specifies that the value of the field (2) is a GUID.
<b>Integer</b>	This field type accepts an integer value.
<b>Invalid</b>	Field type is not specified.
<b>Lookup</b>	This field type enables a reference to another list item. It enables specification of a list identifier for a targeted list. An optional <b>site identifier</b> can also be specified, which specifies the site (2) of the list that contains the target of the <b>lookup field</b> .
<b>MaxItems</b>	Specifies the maximum number of items.
<b>ModStat</b>	Specifies the current status of a moderation process on the document. Value corresponds to one of the moderation status values specified in <a href="#">[MS-WSSFO3]</a> section <a href="#">2.2.1.2.13</a> .
<b>MultiChoice</b>	This field type accepts one or more values from a set of specified choices. This field (2) also accepts free-form values.
<b>Note</b>	This field type accepts a string of text, which can be longer than a Text field (2).
<b>Number</b>	This field type accepts a positive or negative number. A number field (2) supports a setting at the field (2) level that specifies the number of decimal places to display.
<b>PageSeparator</b>	Represents a placeholder for a page separator in a survey list. This field type is intended to be used only with a survey list.
<b>Recurrence</b>	Specifies a field that is used to display recurring events. As with a <b>computed field</b> , this field type is an abstract field type that depends on other fields (2) for its content and definition. It is intended to be used only with an events list.
<b>Text</b>	This field type accepts a string of text up to 255 characters in length.
<b>Threading</b>	Contains data on the threading of items in a discussion board.
<b>ThreadIndex</b>	Contains a compiled index of threads in a discussion board.
<b>User</b>	A lookup field to a user in the User Info list.
<b>URL</b>	This field type accepts a URL and an optional description of the URL.
<b>WorkflowEventType</b>	A description of a type of a historical workflow event. See <b>WorkflowEventType Enumeration</b> (section <a href="#">2.8.1</a> ) for more information.
<b>WorkflowStatus</b>	Contains status on a running workflow for an item. See <b>WorkflowStatus</b> (section <a href="#">2.8.2</a> ) for more details.

## 2.3.2 Extended Field Types

The extended field types are specified in the following table.

Field type name	Description
<b>LookupMulti</b>	Enables entry and storage of multiple values for lookup fields to list items from a specified list.
<b>UserMulti</b>	Enables entry and storage of multiple values for lookup fields to a collection of users.

## 2.4 Common Fields

### 2.4.1 Document Lookup

In the following table, some fields (2) are expressed in the form of a document lookup field to a particular data type. A document lookup field is a special case of a lookup field. As in all lookup fields, a document lookup field is expressed in the form "<item id>#<value>". However, for a document lookup field, the item ID of the item is used, rather than the item ID of the target of the lookup field. The form of a lookup field is defined as follows.

```
SEMICOLONPOUND = ";"#
ITEMID = 1*DIGIT ; identifier of the item
VALUE = *CHAR ; value of the item
LOOKUP = ITEMID SEMICOLONPOUND VALUE
```

### 2.4.2 Base Data Fields

A protocol server supports the fields (2) and identifiers described in the following table.

Field name	ID	Type	Description
<b>_CheckinComment</b>	{58014f77-5463-437b-ab67-eec79532da67}	Document Lookup to string	Last comment from a check-in of the document.
<b>_CopySource</b>	{6b4e226d-3d88-4a36-808d-a129bf52bccf}	Text	Contains a URL of the source list item from which this item was created, if the item was created as a result of a copy operation.
<b>_HasCopyDestinations</b>	{26d0756c-986a-48a7-af35-bf18ab85ff4a}	Boolean	Specifies whether a list item has multiple stored locations to which data is to be copied when the item is updated.
<b>_IsCurrentVersion</b>	{c101c3e7-122d-4d4d-bc34-58e94a38c816}	Boolean	Specifies whether the data represents an appropriate current version or a historical item.
<b>_Level</b>	{43bdd51b-3c5b-4e78-90a8-fb2087f71e70}	Integer	Specifies an integer that represents the publishing level of the document.

Field name	ID	Type	Description
<b>_ModerationComments</b>	{34ad21eb-75bd-4544-8c73-0e08330291fe}	Note	Contains comments from the last moderation action.
<b>_ModerationStatus</b>	{fdc3b2ed-5bf2-4835-a4bc-b885f3396a61}	<b>ModStat</b>	Current moderation status of an item. See <a href="#">[MS-WSSF03]</a> section <a href="#">2.2.1.2.13</a> for a description of values.
<b>_SourceUrl</b>	{c63a459d-54ba-4ab7-933a-dcf1c6fadec2}	Text	Contains an <b>absolute URL</b> to the source document for a <b>Document Workspace site</b> item.
<b>_SharedFileIndex</b>	{034998e9-bf1c-4288-bbbd-00eacfc64410}	Text	Contains an identifier of the Document Workspace site used to manage sharing of this document.
<b>_UIVersion</b>	{7841bf41-43d0-4434-9f50-a673baef7631}	Integer	A single 4-byte integer that contains <b>user interface (UI) version</b> information. The lower 9 bits correspond to the minor version number of the displayed version, and the remaining 23 bits refer to the major version number. For example, a document with a displayed version number of 4.7 would have a UI version value of $(4 * 512) + 7 = 2055$ .
<b>_UIVersionString</b>	{dce8262a-3ae9-45aa-aab4-83bd75fb738a}	Text	Contains a displayable string with the version of the item.
<b>Attachments</b>	{67df98f4-9dec-48ff-a553-29bece9c5bf4}	Attachments	Specifies whether the list item has attachments.
<b>Author</b>	{1df5e554-ec7e-46a6-901d-d85a3881cb18}	User	Identifier of the user who created the item.
<b>BaseName</b>	{7615464b-559e-4302-b8e2-8f440b913101}	Computed	Name of the file, without a file type extension.
<b>ContentType</b>	{c042a256-787d-4a6f-8a8a-cf6ab767f12d}	Text	Name of the content type associated with the item.
<b>ContentTypeId</b>	{03e45e84-1992-4d42-9116-26f756012634}	<b>ContentTypeId</b>	Content type identifier of the item. MUST be a valid content type identifier for the content type of the item.
<b>Created</b>	{8c06beca-0777-48f7-91c7-6da68bc07b69}	<b>DateTime</b>	Date and time at which the item was created.
<b>Created_x0020_Date</b>	{998b5cff-4a35-47a7-92f3-3914aa6aa4a2}	Document Lookup to <b>DateTime</b>	Date and time at which a related file was created.

Field name	ID	Type	Description
<b>Editor</b>	{d31655d1-1d5b-4511-95a1-7a09e9b75bf2}	User	Identifier and name of the user who last edited a document.
<b>File_x0020_Size</b>	{8fca95c0-9b7d-456f-8dae-b41ee2728b85}	Document lookup to integer	Size, in bytes, of the file.
<b>File_x0020_Type</b>	{39360f11-34cf-4356-9945-25c44e68dade}	Text	Extension of the related file of an item.
<b>FileDirRef</b>	{56605df6-8fa1-47e4-a04c-5b384d59609f}	Document Lookup to Text	A <b>store-relative URL</b> of the <b>directory name</b> that contains the related file of an item.
<b>FileLeafRef</b>	{8553196d-ec8d-4564-9861-3dbe931050c8}	File	Name of the file associated with the item. This type contains only the name of the file. It does not contain the URL structure of parent folders of the file.
<b>FileRef</b>	{94f89715-e097-4e8b-ba79-ea02aa8b7adb}	Document Lookup to String	A <b>server-relative URL</b> of the full path of the item's related file.
<b>FSObjType</b>	{30bb605f-5bae-48fe-b4e3-1f81d9772af9}	Document Lookup to Integer	A lookup field to the type of object. See [MS-WSSFO3], 2.2.3.4 for possible values.
<b>GUID</b>	{ae069f25-3ac2-4256-b9c3-15dbc15da0e0}	<b>Guid</b>	Specifies a user-customizable unique identifier of an item.
<b>HTML_x0020_File_x0020_Type</b>	Differs according to the base type. See HTML_x0020_File_x0020_Type in each section of <b>List Base Types</b> (section 2.5).	Differs according to the base type. See HTML_x0020_File_x0020_Type in each section of <b>List Base Types</b> (section 2.5).	Differs according to the base type. See HTML_x0020_File_x0020_Type in each section of <b>List Base Types</b> (section 2.5).
<b>ID</b>	{1d22ea11-1e32-424e-89ab-9fedbadb6ce1}	Counter	Numeric identifier of the item. This field (2) is unique in the parent list.
<b>InstanceID</b>	{50a54da4-1528-4e67-954a-e2d24f1e9efb}	Integer	Contains an identifier of a meeting instance for this item.
<b>Last_x0020_Modified</b>	{173f76c8-aebd-446a-9bc9-769a2bd2c18f}	Document Lookup to <b>DateTime</b>	Lookup to the last modified time of the related file of the item.
<b>MetaInfo</b>	{687c7f94-686a-42d3-9b67-2782eac4b4f8}	Document Lookup to String	A metadict that contains additional properties for the item.
<b>Modified</b>	{28cf69c5-fa48-462a-b5cd-27b6f9d2bd5f}	<b>DateTime</b>	Date and time of the last modification to the item.
<b>Order</b>	{ca4addac-796f-4b23-b093-d2a3f65c0774}	Number	Number used to establish the order of a list item relative to other list items in the list.



Field name	ID	Type	Description
<b>owshiddenversion</b>	{d4e44a66-ee3a-4d02-88c9-4ec5ff3f4cd5}	Integer	Monotonically increasing integer representation of the last change to an item.
<b>ParentVersionString</b>	{BC1A8EFB-0F4C-49f8-A38F-7FE22AF3D3E0}	Document Lookup to String	Contains a lookup field to the <b>UIVersion</b> of the parent file of a converted or transformed file. See <b>Conversion</b> (section <a href="#">2.1.2.11.1.4</a> ) for more information about file conversion.
<b>ParentLeafName</b>	{774EAB3A-855F-4a34-99DA-69DC21043BEC}	Document Lookup to String	Contains a lookup field to the file name of a parent file of a converted or transformed file. See <b>Conversion</b> (section <a href="#">2.1.2.11.1.4</a> ) for more information about file conversion.
<b>PermMask</b>	{BA3C27EE-4791-4867-8821-FF99000BAC98}	Computed	Contains the set of permissions of an item for a user who requests the item.
<b>ProgId</b>	{c5c4b81c-f1d9-4b43-a6a2-090df32ebb68}	Document Lookup to String	A lookup field to the identifier of a client application that can be used to edit this document.
<b>ScopeId</b>	{dddd2420-b270-4735-93b5-92b713d0944d}	Document Lookup to String	Identifier of the <b>security scope</b> to which this item belongs.
<b>ServerUrl</b>	{105f76ce-724a-4bba-aece-f81f2fce58f5}	Computed	Server-relative URL of a file for this item.
<b>Title</b>	Differs according to the base type. See <b>Title</b> in each "Data Fields" subsection of section 2.5.	Text	Specifies a description of the list item.
<b>UniqueId</b>	{4b7403de-8d94-43e8-9f0f-137a3e298126}	Document Lookup to GUID	Lookup to a GUID for an item.
<b>VirusStatus</b>	{4a389cb9-54dd-4287-a71a-90ff362028bc}	Document Lookup to Integer	Integer value that specifies the current virus-checking status of the file. See [MS-WSSFO3] section 2.2.3.15 for more information.
<b>WorkflowInstanceID</b>	{de8beacf-5505-47cd-80a6-aa44e7ffe2f4}	<b>Guid</b>	Specifies the identifier of a workflow instance currently associated with a list item.
<b>WorkflowVersion</b>	{f1e020bc-ba26-443f-bf2f-b68715017bbc}	Integer	Specifies the version of the workflow instance running for a particular item.

### 2.4.3 Base Rendering Fields

These fields (2) define a set of computed fields that render HTML for list views and forms.

Field name	ID	Type	Description
<b>_EditMenuTableEnd</b>	{2ea78cef-1bf9-4019-960a-02c41636cb47}	Computed	Contains an HTML rendering of the end of an edit menu
<b>_EditMenuTableStart</b>	{3c6303be-e21f-4366-80d7-d6d0a3b22c7a}	Computed	Contains an HTML rendering of the beginning of an edit menu.
<b>DocIcon</b>	{081c6e4c-5c14-4f20-b23e-1a71ceb6a67c}	Computed	String that represents HTML that can display a document icon.
<b>Edit</b>	{503f1caa-358e-4918-9094-4a2cdc4bc034}	Computed	Contains an icon-based link to an edit form for this item.
<b>EncodedAbsUrl</b>	{7177fc7-f399-4d4d-905d-37dd51bc90bf}	Computed	Absolute server-relative URL of the related file of an item.
<b>FileSizeDisplay</b>	{78a07ba4-bda8-4357-9e0f-580d64487583}	Computed	Contains a representation of the file size, in kilobytes.
<b>LinkFilename</b>	{5cc6dc79-3710-4374-b433-61cb4a686c12}	Computed	HTML rendition of the name of the item's related file.
<b>LinkFilenameNoMenu</b>	{9d30f126-ba48-446b-b8f9-83745f322ebe}	Computed	HTML rendition of the name of the item's related file.
<b>LinkTitle</b>	{82642ec8-ef9b-478f-acf9-31f7d45fbc31}	Computed	Specifies an HTML rendering of the item, which is used in links with an additional menu of options.
<b>LinkTitleNoMenu</b>	{bc91a437-52e7-49e1-8c4e-4698904b2b6d}	Computed	Specifies an HTML rendering of the item.
<b>SelectFilename</b>	{5f47e085-2150-41dc-b661-442f3027f552}	Computed	Specifies the file name of a document library that can be used in the user interface to select a file version.
<b>SelectTitle</b>	{b1f7969b-ea65-42e1-8b54-b588292635f2}	Computed	Specifies a title field (2) of a list that can be used to select an item version in the user interface.

### 2.4.4 XML Document Data Fields

A protocol server also supports the following fields (2) which are used in a form library.

Field name	ID	Type	Description
<b>TemplateUrl</b>	{4B1BF6C6-4F39-45ac-ACD5-16FE7A214E5E}	Text	Contains a URL link to a template file that is used to create an XML file.
<b>xd_ProgID</b>	{CD1ECB9F-DD4E-4f29-AB9E-E9FF40048D64}	Text	Specifies a field (2) for data that contains the identifier of a preferred client application for XML files.
<b>xd_Signature</b>	{FBF29B2D-CAE5-49aa-8E0A-29955B540122}	Boolean	Specifies an <b>XML Path Language (XPath)</b> used to find a digital signature in a document.

## 2.4.5 XML Document Rendering Fields

This is a set of computed fields that render HTML for form libraries.

Field name	ID	Type	Description
<b>Combine</b>	{E52012A0-51EB-4c0c-8DFB-9B8A0EBEDCB6}	Computed	Includes an HTML user interface for selecting a document to combine.
<b>RepairDocument</b>	{5D36727B-BCB2-47d2-A231-1F0BC63B7439}	Computed	Includes an HTML user interface for selecting a document for repair.

## 2.4.6 Survey Data Fields

The survey data fields are specified in the following table.

Field name	ID	Type	Description
<b>Completed</b>	{35363960-D998-4aad-B7E8-058DFE2C669E}	Computed	Boolean that specifies whether the survey item is finished.

## 2.5 List Base Types

A list has one specified base type, which is one of values in the following table.

Base type name	Value
Generic List	0
Document Library	1
Discussion Board	3

Base type name	Value
Survey	4
Issue	5

An implementation SHOULD NOT have a list with a base type of 3<3>.

A list item has associated fields (2) that are specified in the following sections.

### 2.5.1 Common List Item Fields

These fields (2) are common to all list items, irrespective of base type.

#### 2.5.1.1 Data Fields

Field name	Field ID
<b>_CopySource</b>	{6b4e226d-3d88-4a36-808d-a129bf52bccf}
<b>_HasCopyDestinations</b>	{26d0756c-986a-48a7-af35-bf18ab85ff4a}
<b>_IsCurrentVersion</b>	{c101c3e7-122d-4d4d-bc34-58e94a38c816}
<b>_Level</b>	{43bdd51b-3c5b-4e78-90a8-fb2087f71e70}
<b>_ModerationStatus</b>	{fdc3b2ed-5bf2-4835-a4bc-b885f3396a61}
<b>_UIVersion</b>	{7841bf41-43d0-4434-9f50-a673baef7631}
<b>_UIVersionString</b>	{dce8262a-3ae9-45aa-aab4-83bd75fb738a}
<b>Author</b>	{1df5e554-ec7e-46a6-901d-d85a3881cb18}
<b>BaseName</b>	{7615464b-559e-4302-b8e2-8f440b913101}
<b>ContentType</b>	{c042a256-787d-4a6f-8a8a-cf6ab767f12d}
<b>ContentTypeId</b>	{03e45e84-1992-4d42-9116-26f756012634}
<b>Created</b>	{8c06beca-0777-48f7-91c7-6da68bc07b69}
<b>Created_x0020_Date</b>	{998b5cff-4a35-47a7-92f3-3914aa6aa4a2}
<b>Editor</b>	{d31655d1-1d5b-4511-95a1-7a09e9b75bf2}
<b>EncodedAbsUrl</b>	{7177fcf7-f399-4d4d-905d-37dd51bc90bf}
<b>File_x0020_Type</b>	{39360f11-34cf-4356-9945-25c44e68dade}
<b>FileDirRef</b>	{56605df6-8fa1-47e4-a04c-5b384d59609f}
<b>FileLeafRef</b>	{8553196d-ec8d-4564-9861-3dbe931050c8}
<b>FileRef</b>	{94f89715-e097-4e8b-ba79-ea02aa8b7adb}
<b>FolderChildCount&lt;4&gt;</b>	{960ff01f-2b6d-4f1b-9c3f-e19ad8927341}
<b>FSObjType</b>	{30bb605f-5bae-48fe-b4e3-1f81d9772af9}

Field name	Field ID
<b>ID</b>	{1d22ea11-1e32-424e-89ab-9fedbadb6ce1}
<b>InstanceID</b>	{50a54da4-1528-4e67-954a-e2d24f1e9efb}
<b>ItemChildCount</b> <5>	{b824e17e-a1b3-426e-aecf-f0184d900485}
<b>Last_x0020_Modified</b>	{173f76c8-aebd-446a-9bc9-769a2bd2c18f}
<b>MetaInfo</b>	{687c7f94-686a-42d3-9b67-2782eac4b4f8}
<b>Modified</b>	{28cf69c5-fa48-462a-b5cd-27b6f9d2bd5f}
<b>Order</b>	{ca4addac-796f-4b23-b093-d2a3f65c0774}
<b>owshiddenversion</b>	{d4e44a66-ee3a-4d02-88c9-4ec5ff3f4cd5}
<b>PermMask</b>	{BA3C27EE-4791-4867-8821-FF99000BAC98}
<b>ProgId</b>	{c5c4b81c-f1d9-4b43-a6a2-090df32ebb68}
<b>ScopeId</b>	{dddd2420-b270-4735-93b5-92b713d0944d}
<b>ServerUrl</b>	{105f76ce-724a-4bba-aece-f81f2fce58f5}
<b>SortBehavior</b> <6>	{423874f8-c300-4bfb-b7a1-42e2159e3b19}
<b>SyncClientId</b> <7>	{6d2c4fde-3605-428e-a236-ce5f3dc2b4d4}
<b>UniqueId</b>	{4b7403de-8d94-43e8-9f0f-137a3e298126}

### 2.5.1.2 HTML Rendering Fields

HTML rendering fields (2) provide views, in HTML, for data in a list item. HTML rendering fields (2) are specific to the user interface implementation, and instances of these fields (2) in a list item do not contain underlying data.

Field name	Field ID
<b>_EditMenuTableEnd</b>	{2ea78cef-1bf9-4019-960a-02c41636cb47}
<b>_EditMenuTableStart</b>	{3c6303be-e21f-4366-80d7-d6d0a3b22c7a}
<b>_EditMenuTableStart2</b> <8>	{1344423c-c7f9-4134-88e4-ad842e2d723c}
<b>DocIcon</b>	{081c6e4c-5c14-4f20-b23e-1a71ceb6a67c}
<b>LinkFilename</b>	{5cc6dc79-3710-4374-b433-61cb4a686c12}
<b>LinkFilename2</b> <9>	{224ba411-da77-4050-b0eb-62d422f13d3e}
<b>LinkFilenameNoMenu</b>	{9d30f126-ba48-446b-b8f9-83745f322ebe}

### 2.5.2 Generic List

This base type is the foundation for custom lists that are not document libraries.

Custom list items contain fields (2) from the following table, in addition to those from the common list item field (2) set.

### 2.5.2.1 Data Fields

Field name	Field ID
<b>_ModerationComments</b>	{34ad21eb-75bd-4544-8c73-0e08330291fe}
<b>Attachments</b>	{67df98f4-9dec-48ff-a553-29bece9c5bf4}.
<b>GUID</b>	{ae069f25-3ac2-4256-b9c3-15dbc15da0e0}
<b>HTML_x0020_File_x0020_Type</b>	{4ef1b78f-fdba-48dc-b8ab-3fa06a0c9804}
<b>Title</b>	{fa564e0f-0c70-4ab9-b863-0177e6ddd247}
<b>WorkflowInstanceID</b>	{de8beacf-5505-47cd-80a6-aa44e7ffe2f4}
<b>WorkflowVersion</b>	{f1e020bc-ba26-443f-bf2f-b68715017bbc}

### 2.5.2.2 HTML Rendering Fields

HTML rendering fields (2) provide views, in HTML, for data in a list item. HTML rendering fields (2) are specific to the user interface implementation and instances of these fields (2) in a list item do not contain underlying data.

Field name	Field ID
<b>Edit</b>	{503f1caa-358e-4918-9094-4a2cdc4bc034}
<b>LinkTitle</b>	{82642ec8-ef9b-478f-acf9-31f7d45fbc31}
<b>LinkTitle2&lt;10&gt;</b>	{5f190d91-3dbc-4489-9878-3c092caf35b6}
<b>LinkTitleNoMenu</b>	{bc91a437-52e7-49e1-8c4e-4698904b2b6d}
<b>SelectTitle</b>	{b1f7969b-ea65-42e1-8b54-b588292635f2}

### 2.5.3 Document

This base type serves as the foundation for any document type, and any document library.

#### 2.5.3.1 Data Fields

Field name	Field type	Field ID/Description
<b>_CheckinComment</b>	Lookup	{58014f77-5463-437b-ab67-eec79532da67}
<b>_ModerationComments</b>	Note	{34ad21eb-75bd-4544-8c73-0e08330291fe}
<b>_SharedFileIndex</b>	Text	{034998e9-bf1c-4288-bbbd-00eacfc64410}
<b>_SourceUrl</b>	Text	{c63a459d-54ba-4ab7-933a-dcf1c6fadec2}
<b>CheckedOutTitle</b>	Lookup	Obsolete. A protocol client SHOULD ignore this value.

Field name	Field type	Field ID/Description
<b>CheckedOutUserId</b>	Lookup	{a7b731a3-1df1-4d74-a5c6-e2efba617ae2} User identifier of the user who has checked out a document.
<b>CheckoutUser</b>	User	{3881510a-4e4a-4ee8-b102-8ee8e2d0dd4b}
<b>Created_x0020_By</b>	Text	{4dd7e525-8d6b-4cb4-9d3e-44ee25f973eb}
<b>DocConcurrencyNumber&lt;11&gt;</b>	Lookup	{8e69e8e8-df8a-45dc-858a-1b806dde24c0}
<b>File_x0020_Size</b>	Lookup	{8fca95c0-9b7d-456f-8dae-b41ee2728b85}
<b>GUID</b>	<b>Guid</b>	{ae069f25-3ac2-4256-b9c3-15dbc15da0e0} Specifies a unique identifier for the document.
<b>HTML_x0020_File_x0020_Type</b>	Text	{0c5e0085-eb30-494b-9cdd-ece1d3c649a2} Contains a <b>ProgID</b> of a client application for HTML- and XML-based files.
<b>IsCheckedoutToLocal</b>	Lookup	{cfaabd0f-bdbd-4bc2-b375-1e779e2cad08} Specifies whether the file is checked out to a local copy of the file.
<b>Modified_x0020_By</b>	Text	{822c78e3-1ea9-4943-b449-57863ad33ca9}
<b>ParentLeafName</b>	Lookup	{774EAB3A-855F-4a34-99DA-69DC21043BEC}
<b>ParentVersionString</b>	Lookup	{BC1A8EFB-0F4C-49f8-A38F-7FE22AF3D3E0}
<b>Title</b>	Text	{fa564e0f-0c70-4ab9-b863-0177e6ddd247}
<b>TemplateUrl</b>	Text	{4b1bf6c6-4f39-45ac-acd5-16fe7a214e5e}
<b>VirusStatus</b>	Lookup	{4a389cb9-54dd-4287-a71a-90ff362028bc}
<b>WorkflowInstanceID</b>	<b>Guid</b>	{de8beacf-5505-47cd-80a6-aa44e7ffe2f4}
<b>WorkflowVersion</b>	Integer	{f1e020bc-ba26-443f-bf2f-b68715017bbc}
<b>xd_ProgID</b>	Text	{cd1ecb9f-dd4e-4f29-ab9e-e9ff40048d64}
<b>xd_Signature</b>	Boolean	{fbf29b2d-cae5-49aa-8e0a-29955b540122}

### 2.5.3.2 HTML Rendering Fields

HTML rendering fields (2) provide specific views, in HTML, for data in a list item. HTML rendering fields (2) are specific to the user interface implementation, and instances of these fields (2) in a list item do not contain underlying data.

Field name	Field type	Field ID or description
<b>Combine</b>	Computed	{e52012a0-51eb-4c0c-8dfb-9b8a0ebedcb6}
<b>Edit</b>	Computed	{503f1caa-358e-4918-9094-4a2cdc4bc034}
<b>FileSizeDisplay</b>	Computed	{78a07ba4-bda8-4357-9e0f-580d64487583}

Field name	Field type	Field ID or description
<b>LinkCheckedOutTitle</b>	Computed	Obsolete. A protocol client SHOULD ignore this value.
<b>RepairDocument</b>	Computed	{5d36727b-bcb2-47d2-a231-1f0bc63b7439}
<b>SelectFilename</b>	Computed	{5f47e085-2150-41dc-b661-442f3027f552}
<b>SelectTitle</b>	Computed	{b1f7969b-ea65-42e1-8b54-b588292635f2}

## 2.5.4 Discussion Board

Specifies the base type of a discussion board. This base type is obsolete. Implementations of discussion boards SHOULD implement discussion boards using the pattern of the Discussion Board list, which is based on the base type specified in **Generic List** (section [2.5.2](#))<12>.

### 2.5.4.1 Data Fields

Field name	Type	Field ID or description
<b>_ModerationComments</b>	Note	{34ad21eb-75bd-4544-8c73-0e08330291fe}
<b>Attachments</b>	Attachments	{67df98f4-9dec-48ff-a553-29bece9c5bf4}.
<b>Body</b>	Note	Contains the body of the item. ID: {7662cd2c-f069-4dba-9e35-082cf976e170}
<b>GUID</b>	<b>Guid</b>	{ae069f25-3ac2-4256-b9c3-15dbc15da0e0}
<b>Title</b>	Text	{fa564e0f-0c70-4ab9-b863-0177e6ddd247}

### 2.5.4.2 HTML Rendering Fields

HTML rendering fields (2) provide views, in HTML, for data in a list item. HTML rendering fields (2) are specific to the user interface implementation, and instances of these fields (2) in a list item do not contain underlying data.

Field name	Type	Field ID or description
<b>BodyAndMore</b>	Computed	{c7e9537e-bde4-4923-a100-adbd9e0a0a0d}
<b>BodyWasExpanded</b>	Computed	{af82aa75-3039-4573-84a8-73ffdfd22733}
<b>CorrectBodyToShow</b>	Computed	{b0204f69-2253-43d2-99ad-c0df00031b66}
<b>DiscussionTitle</b>	Computed	{c5abfdc7-3435-4183-9207-3d1146895cf8}
<b>Edit</b>	Computed	{503f1caa-358e-4918-9094-4a2cdc4bc034}
<b>FullBody</b>	Computed	{9c4be348-663a-4172-a38a-9714b2634c17}



Field name	Type	Field ID or description
<b>Indentation</b>	Computed	{26c4f53e-733a-4202-814b-377492b6c841}
<b>IndentLevel</b>	Computed	{68227570-72dd-4816-b6b6-4b81ff99a393}
<b>IsRootPost</b>	Computed	{bd2216c1-a2f3-48c0-b21c-dc297d0cc658}
<b>LessLink</b>	Computed	{076193bd-865b-4de7-9633-1f12069a6fff}
<b>LimitedBody</b>	Computed	{61b97279-cbc0-4aa9-a362-f1ff249c1706}
<b>LinkDiscussionTitleNoMenu</b>	Computed	{3ac9353f-613f-42bd-98e1-530e9fd1cbf6}
<b>LinkDiscussionTitle</b>	Computed	{46045bc4-283a-4826-b3dd-7a78d790b266}
<b>MessageBody</b>	Computed	{fbba993f-afee-4e00-b9be-36bc660dcd1}
<b>MoreLink</b>	Computed	{fb6c2494-1b14-49b0-a7ca-0506d6e85a62}
<b>PersonImage</b>	Computed	{adfe65ee-74bb-4771-bec5-d691d9a6a14e}
<b>PersonViewMinimal</b>	Computed	{b4ab471e-0262-462a-8b3f-c1dfc9e2d5fd}
<b>QuotedTextWasExpanded</b>	Computed	{e393d344-2e8c-425b-a8c3-89ac3144c9a2}
<b>ReplyNoGif</b>	Computed	{87cda0e2-fc57-4eec-a696-b0de2f61f361}
<b>StatusBar</b>	Computed	{f90bce56-87dc-4d73-bfcb-03fcfa670500}
<b>Threading</b>	Computed	Renders a view of an item of this thread, with indents for replies. Id: {58ca6516-51cd-41fb-a908-dd2a4aeaa8bc}
<b>ThreadingControls</b>	Computed	{c55a4674-640b-4bae-8738-ce0439e6f6d4}
<b>ToggleQuotedText</b>	Computed	{e451420d-4e62-43e3-af83-010d36e353a2}

## 2.5.5 Survey

Survey is a base type for survey lists.

### 2.5.5.1 Data Fields

The Survey base type has the following data fields.

Field name	Type	Field ID or description
<b>Completed</b>	Computed	{35363960-d998-4aad-b7e8-058dfe2c669e}
<b>HTML_x0020_File_x0020_Type</b>	Computed	{4ef1b78f-fdba-48dc-b8ab-3fa06a0c9804}
<b>Title</b>	Text	Display name of the survey response. {e6f528fb-2e22-483d-9c80-f2536acdc6de}

### 2.5.5.2 HTML Rendering Fields

HTML rendering fields (2) provide views, in HTML, for data in a list item. HTML rendering fields (2) are specific to the user interface implementation, and instances of these fields (2) in a list item do not contain underlying data.

Field name	Type	Field ID or description
<b>DisplayResponse</b>	Computed	Displays a link to a response item. ID: {1443b460-28a8-4050-9994-c24971a765ec}
<b>DisplayResponseNoMenu</b>	Computed	Displays a link to a response item. ID: {f5fd696c-6384-4bb9-bc11-54fa101baf8f}

### 2.5.6 Issue

Issue serves as a base type for issue tracking lists.

#### 2.5.6.1 Data Fields

The Issue base type has the following data fields.

Field name	Type	Field ID or description
<b>_ModerationComments</b>	Note	{34ad21eb-75bd-4544-8c73-0e08330291fe}
<b>AssignedTo</b>	User	{53101f38-dd2e-458c-b245-0c236cc13d1a}
<b>Attachments</b>	Attachments	{67df98f4-9dec-48ff-a553-29bece9c5bf4}
<b>Category</b>	Choice	{6df9bd52-550e-4a30-bc31-a4366832a87d}
<b>Comment</b>	Note	{6df9bd52-550e-4a30-bc31-a4366832a87f}
<b>DueDate</b>	<b>DateTime</b>	{cd21b4c2-6841-4f9e-a23a-738a65f99889}
<b>GUID</b>	<b>Guid</b>	{ae069f25-3ac2-4256-b9c3-15dbc15da0e0}
<b>HTML_x0020_File_x0020_Type</b>	Computed	{4ef1b78f-fdba-48dc-b8ab-3fa06a0c9804}
<b>IsCurrent</b>	Boolean	Indicates whether an issue is a historical copy of an item or a current version of an item. ID: {070bff9d-1307-455d-aebd-5b7164cb469e}
<b>Priority</b>	Choice	{a8eb573e-9e11-481a-a8c9-1104a54b2fbd}
<b>RelatedIssue</b>	Integer	Integer identifier of a related item. ID: {156af935-b442-4f69-a8b9-089100f2de78}
<b>RelatedID</b>	<b>Guid</b>	Identifier of a related item. Id: {801300c6-80c4-4758-8ce2-a38dec2e452f}
<b>RelatedIssues</b>	LookupMulti	{875fab27-6e95-463b-a4a6-82544f1027fb}
<b>Status</b>	Choice	{3f277a5c-c7ae-4bbe-9d44-0456fb548f94}

Field name	Type	Field ID or description
<b>Title</b>	Text	Display name of an item. {fa564e0f-0c70-4ab9-b863-0177e6ddd247}
<b>V3Comments</b>	Note	{6df9bd52-550e-4a30-bc31-a4366832a87e}

### 2.5.6.2 HTML Rendering Fields

HTML rendering fields (2) provide views, in HTML, for data in a list item. HTML rendering fields (2) are specific to the user interface implementation, and instances of these fields (2) in a list item do not contain underlying data.

Field name	Type	Field ID or description
<b>Edit</b>	Computed	{503f1caa-358e-4918-9094-4a2cdc4bc034}
<b>IssueID</b>	Computed	Rendition of the item identifier. ID: {de57307b-e69a-4cf9-b3a9-b6a728ecf773}
<b>LinkIssueIDNoMenu</b>	Computed	{03f89857-27c9-4b58-aaab-620647deda9b}
<b>LinkTitle</b>	Computed	{82642ec8-ef9b-478f-acf9-31f7d45fbc31}
<b>LinkTitle2&lt;13&gt;</b>	Computed	{5f190d91-3dbc-4489-9878-3c092caf35b6}
<b>LinkTitleNoMenu</b>	Computed	{bc91a437-52e7-49e1-8c4e-4698904b2b6d}
<b>LinkTitleVersionNoMenu</b>	Computed	Renders a link to a version of an item. ID: {67f6307f-c161-4096-a5a7-b77016c08100}
<b>RemoveRelatedID</b>	Computed	{d8a2155a-aaf8-4d38-a14d-52bc83061d05}
<b>SelectTitle</b>	Computed	{b1f7969b-ea65-42e1-8b54-b588292635f2}

## 2.6 Content Types

The set of content types in the following sections represents the core set of content types that a protocol server implements.

### 2.6.1 Base Content Types

#### 2.6.1.1 System

**Id:** 0x

The following table lists the fields (2).

Field name	Field ID
<b>ContentType</b>	{c042a256-787d-4a6f-8a8a-cf6ab767f12d}

This is the base content type of protocol server. This content type is abstract; a list item MUST NOT have this content type as its associated content type.

### 2.6.1.2 Item

**Id:** 0x01

The following table lists the fields (2).

Field name	Field ID
<b>ContentType</b>	{c042a256-787d-4a6f-8a8a-cf6ab767f12d}
<b>Title</b>	{fa564e0f-0c70-4ab9-b863-0177e6ddd247}

Specifies the base content type for a list item in a site. All list items in a site have a content type that is, or derives from, this content type.

### 2.6.1.3 Document

**Id:** 0x0101

The following table lists the fields (2).

Field name	Field ID
<b>ContentType</b>	{c042a256-787d-4a6f-8a8a-cf6ab767f12d}
<b>Created</b>	{8c06beca-0777-48f7-91c7-6da68bc07b69}
<b>Created_x0020_By</b>	{4dd7e525-8d6b-4cb4-9d3e-44ee25f973eb}
<b>FileLeafRef</b>	{8553196d-ec8d-4564-9861-3dbe931050c8}
<b>Modified</b>	{28cf69c5-fa48-462a-b5cd-27b6f9d2bd5f}
<b>Modified_x0020_By</b>	{822c78e3-1ea9-4943-b449-57863ad33ca9}
<b>SelectFilename</b>	{5f47e085-2150-41dc-b661-442f3027f552}
<b>Title</b>	{fa564e0f-0c70-4ab9-b863-0177e6ddd247}

Specifies the base content type for a document in a site. All documents in a site have a content type that is, or derives from, this content type.

### 2.6.1.4 Folder

**Id:** 0x0120

The following table lists the fields (2).

Field name	Field ID
<b>ContentType</b>	{c042a256-787d-4a6f-8a8a-cf6ab767f12d}
<b>FileLeafRef</b>	{8553196d-ec8d-4564-9861-3dbe931050c8}
<b>Title</b>	{fa564e0f-0c70-4ab9-b863-0177e6ddd247}

Specifies the base content type for a folder in a site. All folders in a site (2) have a content type that is, or derives from, this content type.

## 2.7 List Template Types

The following table describes standard list template types used for storing data in a site (2). This does not include templates that can be additionally installed on a protocol server.

List template type	Template ID	Base type	Description
<b>Custom List</b>	100	0	A basic list that can be adapted for multiple purposes.
<b>Document Library</b>	101	1	Contains a list of documents and other files.
<b>Survey</b>	102	4	Fields (2) on a survey list represent questions that are asked of survey participants. Items in a list represent a set of responses to a survey.
<b>Links</b>	103	0	Contains a list of hyperlinks and their descriptions.
<b>Announcements</b>	104	0	Contains a set of simple announcements.
<b>Contacts</b>	105	0	Contains a list of contacts used for tracking people in a site (2).
<b>Calendar</b>	106	0	Contains a list of single and recurring events. An events list has special views for displaying events on a calendar.
<b>Tasks</b>	107	0	Contains a list of items that represent finished and pending work items.
<b>Discussion Board</b>	108	0	Contains discussions entries and their replies.
<b>Picture Library</b>	109	1	Contains a library adapted for storing and viewing digital pictures.
<b>DataSources</b>	110	1	Contains data connection description files.
<b>Form Library</b>	115	1	Contains XML documents. An XML form library can also contain templates for displaying and editing XML files through forms, as well as rules for specifying how XML data is converted to and from list items.
<b>No Code Workflows</b>	117	1	Contains additional workflow definitions that describe new processes that can be used in lists. These workflow definitions do not contain advanced code-based extensions.
<b>Custom Workflow Process</b>	118	0	Contains a list used to support custom workflow process actions.
<b>Wiki Page Library</b>	119	1	Contains a set of editable Web pages.
<b>CustomGrid</b>	120	0	Contains a set of list items with a grid-editing view.
<b>No Code Public Workflows</b> <a href="#">&lt;14&gt;</a>	122	1	A gallery for storing workflow definitions that do not contain advanced code-based extensions.

List template type	Template ID	Base type	Description
<b>Workflow History</b>	140	0	Contains a set of history items for instances of workflows.
<b>Project Tasks</b>	150	0	Contains a list of tasks with specialized views of task data in the form of Gantt chart.
<b>Public Workflows External List</b> <15>	600	0	An external list for viewing the data of an external content type.
<b>Issues Tracking</b>	1100	5	Contains a list of items to track issues.

## 2.8 Common Data Structures and Enumerations

### 2.8.1 WorkflowEventType Enumeration

Contains an integer that corresponds to one of the values in the following table.

Value	Description
0	None. Workflow event is not of a particular type.
1	Workflow was started.
2	Workflow was finished.
3	Workflow was canceled.
4	Workflow was deleted.
5	Workflow task was created.
6	Workflow task was finished.
7	Workflow task was modified.
8	Workflow task was rolled back.
9	Workflow task was deleted.
10	Workflow has encountered an item.
11	Workflow has had a comment logged for it.

### 2.8.2 WorkflowStatus

An integer describing the status of the workflow. The following values are defined, but the field is vendor-extensible, and other values are allowed.

Value	Name	Description
0	WFSTAT_NOTSTARTED	The workflow has not yet started running.
1	WFSTAT_FAILEDTOSTART	The workflow failed to start.

Value	Name	Description
2	WFSTAT_INPROGRESS	A front-end web server is processing the workflow.
3	WFSTAT_FAULTING	The workflow has encountered a faulting error.
4	WFSTAT_USERCANCEL	The workflow was canceled by a user.
5	WFSTAT_COMPLETED	The workflow has completely processed.
6	WFSTAT_FAILEDTOSTART_RETRY	The workflow failed to start. Processing can be attempted again.
7	WFSTAT_FAULTING_RETRY	The workflow has encountered a faulting error. Processing can be attempted again.

## 2.9 Expressions

A protocol server formula MUST be the same as those specified by [\[ISO/IEC29500-1:2011\]](#) section 18.17 with some deviation as specified by the following subsections.

### 2.9.1 Syntax

The syntax rules for formulas are the same as those specified by [\[ISO/IEC29500-1:2011\]](#) section 18.17.2, but the exact syntax structure MUST be as specified by the following **ABNF** [\[RFC5234\]](#).

```

formula = expression

expression = *space nospace-expression *space

space = " "

nospace-expression = "(" expression ")" / constant / (prefix-operator
expression) / (expression infix-operator expression) / data-reference / function-
call

```

**nospace-expression:** Supports nesting expressions within other expressions. Expressions MUST NOT nest more than 64 levels deep.

**<constant>:** MUST be any constant defined by [\[ISO/IEC29500-1:2011\]](#) section 18.17.2.1 excluding array-constant.

```

infix-operator = "^" / "*" / "/" / "+" / "-" / "=" / "<>" / "<" / "<=" / ">" / ">="

prefix-operator = "-" / "+"

data-reference = field-name-no-spaces / (open-bracket field-name-with-spaces
closed-bracket)

```

**data-reference:** Corresponds to the name of a field in the current list.

```

field-name-no-spaces = 1*64name-character-no-space

name-character-no-space = character

```

**name-character-no-space:** MUST NOT be a space, open bracket ([), close bracket (]), or any character whose hexadecimal value is less than 0x20.

**<character>:** MUST be the production **Char** as specified by [\[W3C-XML\]](#) section 2.2.

```
open-bracket= "["  
  
field-name-with-spaces = name-character-no-space [*62name-character name-character-no-space]  
  
name-character = name-character-no-space / space  
  
closed-bracket= "]"  
  
function-call = predefined-function-call / defined-function-call  
  
predefined-function-call = function-name "(" [argument-list] ")"
```

**<function-name>:** MUST be one of the functions listed in **Function Names** (section [2.9.2](#)).

```
argument-list = argument *253(comma argument)  
  
comma= ","  
  
argument = expression  
  
defined-function-call = ("AND.DB" argument-list-params) / ("CONCATENATE.DB"  
argument-list-params) / ("DATETIME" datetime-params) / ("ISNULL" single-argument-  
params) / ("NOW.TIME()") / ("NULL()") / ("NZ" two-argument-params) / ("OR.DB"  
argument-list-params) / ("TRIMENDS" single-argument-params) / ("USDOLLAR" two-  
argument-params)  
  
argument-list-params = "(" argument-list ")"  
  
single-argument-params = "(" argument ")"  
  
two-argument-params = "(" argument comma argument ")"  
  
datetime-params = "(" argument 5*5(comma argument) ")"
```

## 2.9.2 Function Names

The set of predefined functions is divided into the functional categories in the following table. All references to subsections of 18.17.7 are in [\[ISO/IEC29500-1:2011\]](#).

Category	Formulas
Database	DAVERAGE section 18.17.7.77 DCOUNT section 18.17.7.81 DCOUNTA section 18.17.7.82 DGET section 18.17.7.90 DMAX section 18.17.7.92 DMIN section 18.17.7.93 DPRODUCT section 18.17.7.97 DSTDEV section 18.17.7.98



Category	Formulas
	DSTDEVP section 18.17.7.99 DSUM section 18.17.7.100 DVAR section 18.17.7.102 DVARP section 18.17.7.103
Date and time	DATE section 18.17.7.74 DATEDIF section 18.17.7.75 DATEVALUE section 18.17.7.76 DAY section 18.17.7.78 DAYS360 section 18.17.7.79 HOUR section 18.17.7.144 MINUTE section 18.17.7.214 MONTH section 18.17.7.220 NOW section 18.17.7.234 SECOND section 18.17.7.287 TIME section 18.17.7.323 TIMEVALUE section 18.17.7.324 TODAY section 18.17.7.326 WEEKDAY section 18.17.7.344 YEAR section 18.17.7.351
Financial	DB section 18.17.7.80 DDB section 18.17.7.83 FV section 18.17.7.129 IPMT section 18.17.7.172 IRR section 18.17.7.173 ISPMT section 18.17.7.184 MIRR section 18.17.7.216 NPER section 18.17.7.235 NPV section 18.17.7.236 PMT section 18.17.7.253 PPMT section 18.17.7.256 PV section 18.17.7.263 RATE section 18.17.7.270 SLN section 18.17.7.293 SYD section 18.17.7.314 VDB section 18.17.7.342
Information	CELL section 18.17.7.34 ERROR.TYPE section 18.17.7.110 ISBLANK section 18.17.7.174 ISERR section 18.17.7.175 ISERROR section 18.17.7.176 ISLOGICAL section 18.17.7.178 ISNA section 18.17.7.179 ISNONTEXT section 18.17.7.180 ISNUMBER section 18.17.7.181 ISODD section 18.17.7.183 ISREF section 18.17.7.185

Category	Formulas
	ISTEXT section 18.17.7.186 N section 18.17.7.223 NA section 18.17.7.224 TYPE section 18.17.7.334
Logical	AND section 18.17.7.9 FALSE section 18.17.7.117 IF section 18.17.7.147 NOT section 18.17.7.233 OR section 18.17.7.246 TRUE section 18.17.7.330
Lookup and reference	ADDRESS section 18.17.7.6 AREAS section 18.17.7.10 CHOOSE section 18.17.7.39 COLUMN section 18.17.7.42 COLUMNS section 18.17.7.43 HLOOKUP section 18.17.7.143 HYPERLINK section 18.17.7.145 INDEX section 18.17.7.166 INDIRECT section 18.17.7.167 LOOKUP section 18.17.7.202 MATCH section 18.17.7.204 OFFSET section 18.17.7.245 ROW section 18.17.7.281 ROWS section 18.17.7.282 TRANSPOSE section 18.17.7.327 VLOOKUP section 18.17.7.343
Math and Trig	ABS section 18.17.7.1 ACOS section 18.17.7.4 ACOSH section 18.17.7.5 ASIN section 18.17.7.12 ASINH section 18.17.7.13 ATAN section 18.17.7.14 ATAN2 section 18.17.7.15 ATANH section 18.17.7.16 CEILING section 18.17.7.33 COMBIN section 18.17.7.44 COS section 18.17.7.50 COSH section 18.17.7.51 DEGREES section 18.17.7.87 EVEN section 18.17.7.111 EXP section 18.17.7.113 FACT section 18.17.7.115 FLOOR section 18.17.7.125 INT section 18.17.7.169 LN section 18.17.7.196 LOG section 18.17.7.197

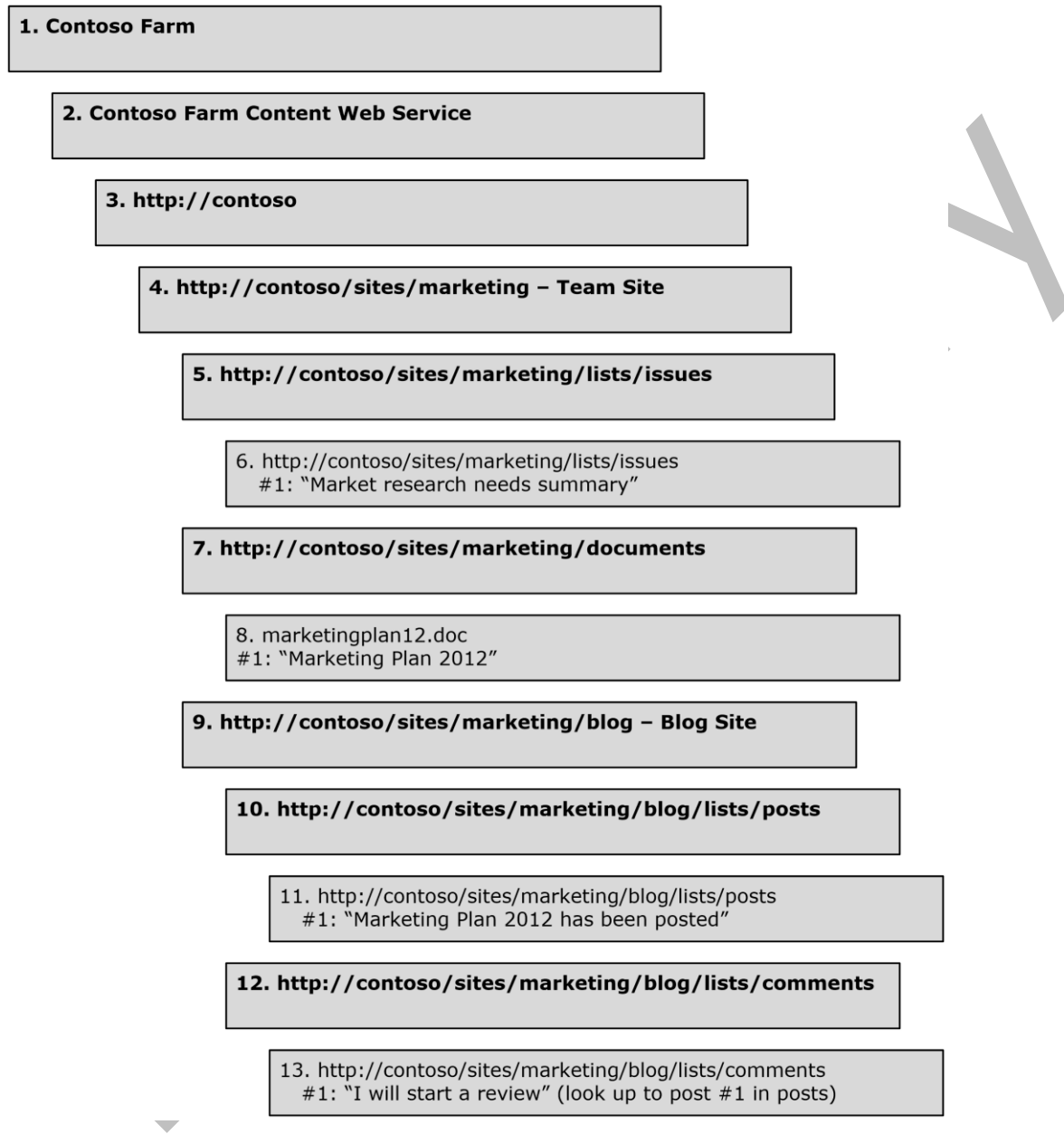
Category	Formulas
	LOG10 section 18.17.7.198 MDETERM section 18.17.7.207 MINVERSE section 18.17.7.215 MMULT section 18.17.7.217 MOD section 18.17.7.218 ODD section 18.17.7.240 PI section 18.17.7.252 POWER section 18.17.7.255 PRODUCT section 18.17.7.261 RADIANS section 18.17.7.266 RAND section 18.17.7.267 ROMAN section 18.17.7.277 ROUND section 18.17.7.278 ROUNDDOWN section 18.17.7.279 ROUNDUP section 18.17.7.280 SIGN section 18.17.7.289 SIN section 18.17.7.290 SINH section 18.17.7.291 SQRT section 18.17.7.296 SUBTOTAL section 18.17.7.305 SUM section 18.17.7.306 SUMIF section 18.17.7.307 SUMPRODUCT section 18.17.7.309 SUMSQ section 18.17.7.310 SUMX2MY2 section 18.17.7.311 SUMX2PY2 section 18.17.7.312 SUMXMY2 section 18.17.7.313 TAN section 18.17.7.316 TANH section 18.17.7.317 TRUNC section 18.17.7.332
Statistical	AVEDEV section 18.17.7.17 AVERAGE section 18.17.7.18 AVERAGEA section 18.17.7.19 BETADIST section 18.17.7.27 BETAINV section 18.17.7.28 BINOMDIST section 18.17.7.32 CHIDIST section 18.17.7.36 CHIINV section 18.17.7.37 CHITEST section 18.17.7.38 CONFIDENCE section 18.17.7.47 CORREL section 18.17.7.49 COUNT section 18.17.7.52 COUNTA section 18.17.7.53 COUNTBLANK section 18.17.7.54 COUNTIF section 18.17.7.55 COVAR section 18.17.7.63 CRITBINOM section 18.17.7.64

Category	Formulas
	DEVSQ section 18.17.7.89 EXPONDIST section 18.17.7.114 FDIST section 18.17.7.118 FINV section 18.17.7.121 FISHER section 18.17.7.122 FISHERINV section 18.17.7.123 FORECAST section 18.17.7.126 FREQUENCY section 18.17.7.127 FTEST section 18.17.7.128 GAMMADIST section 18.17.7.131 GAMMAINV section 18.17.7.132 GAMMALN section 18.17.7.133 GEOMEAN section 18.17.7.135 GROWTH section 18.17.7.138 HARMEAN section 18.17.7.139 HYPGEOMDIST section 18.17.7.146 INTERCEPT section 18.17.7.170 KURT section 18.17.7.188 LARGE section 18.17.7.189 LINEST section 18.17.7.195 LOGEST section 18.17.7.199 LOGINV section 18.17.7.200 LOGNORMDIST section 18.17.7.201 MAX section 18.17.7.205 MAXA section 18.17.7.206 MEDIAN section 18.17.7.209 MIN section 18.17.7.212 MINA section 18.17.7.213 MODE section 18.17.7.219 NEGBINOMDIST section 18.17.7.225 NORMDIST section 18.17.7.229 NORMINV section 18.17.7.230 NORMSDIST section 18.17.7.231 NORMSINV section 18.17.7.232 PEARSON section 18.17.7.247 PERCENTILE section 18.17.7.248 PERCENTRANK section 18.17.7.249 PERMUT section 18.17.7.250 POISSON section 18.17.7.254 PROB section 18.17.7.260 QUARTILE section 18.17.7.264 RANK section 18.17.7.269 RSQ section 18.17.7.283 SKEW section 18.17.7.292 SLOPE section 18.17.7.294 SMALL section 18.17.7.295 STANDARDIZE section 18.17.7.298 STDEV section 18.17.7.299

Category	Formulas
	STDEVA section 18.17.7.300 STDEVP section 18.17.7.301 STDEVPA section 18.17.7.302 STEYX section 18.17.7.303 TDIST section 18.17.7.321 TINV section 18.17.7.325 TREND section 18.17.7.328 TRIMMEAN section 18.17.7.330 TTEST section 18.17.7.333 VAR section 18.17.7.338 VARA section 18.17.7.339 VARP section 18.17.7.340 VARPA section 18.17.7.341 WEIBULL section 18.17.7.346 ZTEST section 18.17.7.356
Text and data	ASC section 18.17.7.11 CHAR section 18.17.7.35 CLEAN section 18.17.7.40 CODE section 18.17.7.41 CONCATENATE section 18.17.7.46 DOLLAR section 18.17.7.94 EXACT section 18.17.7.112 FIND section 18.17.7.119 FIXED section 18.17.7.124 LEFT section 18.17.7.191 LEN section 18.17.7.193 LOWER section 18.17.7.203 MID section 18.17.7.210 PROPER section 18.17.7.262 REPLACE section 18.17.7.272 REPT section 18.17.7.274 RIGHT section 18.17.7.275 SEARCH section 18.17.7.285 SUBSTITUTE section 18.17.7.304 T section 18.17.7.315 TEXT section 18.17.7.322 TRIM section 18.17.7.329 UPPER section 18.17.7.335 VALUE section 18.17.7.337

### 3 Structure Examples

The following state diagram represents an example structure and scenario of a protocol server farm and its constituent sites. This example represents the structure of a basic intranet set of sites (2).



**Figure 3: Example structure of administration and content objects**

The following objects are used in the example:

1. A farm administration object that describes the Contoso farm and its administration, as well as settings that apply to all objects in the farm.
2. A service that renders Web site content for the Contoso farm.
3. A Web application with a root server base URL of http://contoso/.

4. The /marketing segment represents a site collection that stores content for a marketing team. The /marketing site has a wildcard managed path (/sites/) that supports multiple child site collections. /marketing not only represents the entire site collection (sites and subsites under that path segment in the URL hierarchy), but also a root team site at /marketing, as well as a root folder at /marketing. The root team site (2) is a site (2) based on the Team Site site definition.
5. The /issues segment represents a list of issues. The base type of this list is 5, and the type of the list template is 1100. The /issues segment has a parent site (/marketing), but it also has a parent folder (/lists). In this example, this is the /lists simple folder that groups multiple lists.
6. An item in the issue list. The issue has an identifier of #1 and contains data for various fields (2), such as the issue title.
7. The /documents segment represents a document library for containing documents. The base type of this library is 1, and the type of the list template is 101. The parent site of this library is /marketing, and the parent folder of this library is /marketing as well.
8. The marketingplan08.doc segment represents a document contained in the document library. A file is located at <http://contoso/sites/marketing/documents/marketingplan08.doc>. A list item with an identifier of #1 corresponding to marketingplan08.doc is also stored, which contains additional properties of the document, such as the document title.
9. The /blog segment represents a subsite in the /marketing site collection, as well as a folder called /blog. The parent site of /blog is /marketing. The /blog site (2) is based on a custom blog site definition.
10. The /posts segment represents a list of blog posts. The base type of this list is zero, and the type of the list template is 301. The list template is defined in the blog site definition.
11. A post list item with an item identifier of 1 is in the /posts list. This list item contains content for fields (2) of the post list, including the body of post content.
12. The /comments segment represents a list of comments for blog posts. The base type of this list is zero, and the type of the list template is 302. The list template is defined in the blog site definition.
13. A comment list item with an item identifier of 1 is in the /comments list. This list item contains content for various fields (2) of the comment list, including the body of comment content. This list item also has a lookup field defined, and item #1 has a lookup field to item #1 in the Posts list.

## **4 Security**

### **4.1 Security Considerations for Implementers**

None.

### **4.2 Index of Security Fields**

None.

Preliminary



## 5 Appendix A: Product Behavior

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

- Microsoft SharePoint Foundation 2010
- Windows SharePoint Services 3.0
- Microsoft SharePoint Foundation 2013
- Microsoft SharePoint Server 2016 Preview

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

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

[<1> Section 2.1.2.16.1](#): In Windows SharePoint Services 3.0 and SharePoint Foundation 2010, these nodes are not hidden when rendered using a site map provider.

[<2> Section 2.1.2.16.2](#): In Windows SharePoint Services 3.0 and SharePoint Foundation 2010, the following navigation node element identifiers have a special meaning:

- 1000 represents the navigation node pointing to the home page of the site (2).
- 1002 represents a navigation node that is the parent of all navigation nodes that are rendered on the top of every page. This navigation node is of type zero with the **LinkBar** property set to 1.
- 1025 represents a navigation node that is the parent of a set of navigation nodes that link to the most commonly used lists, document libraries, and other pages. This navigation node is of type zero with the **LinkBar** property set to 1.

[<3> Section 2.5](#): In Windows SharePoint Services 3.0, the discussion board base type is obsolete. New discussion boards use the generic list base type.

[<4> Section 2.5.1.1](#): Windows SharePoint Services 3.0 does not have this field.

[<5> Section 2.5.1.1](#): In Windows SharePoint Services 3.0, only the Discussion Board list has this field, and other kinds of lists do not have this field.

[<6> Section 2.5.1.1](#): Windows SharePoint Services 3.0 does not have this field.

[<7> Section 2.5.1.1](#): Windows SharePoint Services 3.0 does not have this field.

[<8> Section 2.5.1.2](#): Windows SharePoint Services 3.0 does not have this field.

[<9> Section 2.5.1.2](#): Windows SharePoint Services 3.0 does not have this field.

[<10> Section 2.5.2.2](#): Windows SharePoint Services 3.0 does not contain this field.

[<11> Section 2.5.3.1](#): Windows SharePoint Services 3.0 does not contain this field.

[<12> Section 2.5.4](#): In Windows SharePoint Services 3.0, the discussion board base type is obsolete. New discussion boards use the generic list base type.

<13> [Section 2.5.6.2](#): Windows SharePoint Services 3.0 does not contain this field.

<14> [Section 2.7](#): Windows SharePoint Services 3.0 does not support this template type.

<15> [Section 2.7](#): Windows SharePoint Services 3.0 does not support this template type.

Preliminary

## 6 Change Tracking

This section identifies changes that were made to this document since the last release. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

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 or functionality.
- The removal of a document from the documentation set.

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 **Editorial** means that the formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the technical content of the document is identical to the last released version.

Major and minor changes can be described further using the following change types:

- New content added.
- Content updated.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.
- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- Obsolete document removed.

Editorial changes are always classified with the change type **Editorially updated**.

Some important terms used in the change type descriptions are defined as follows:

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

The changes made to this document are listed in the following table. For more information, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com).

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
<a href="#">5</a> Appendix A: Product Behavior	Updated list of supported products.	Y	Content updated due to protocol revision.

Preliminary

## 7 Index

### A

- [Abstract data structures](#) 14
- [Administration and configuration](#) 14
- [Administration object](#) 15
- [Administration Web service object](#) 15
- [Applicability](#) 12
- Authentication
  - [group](#) 26
  - [permission](#) 27
  - [principal](#) 26
  - [read my own, write my own](#) 27
  - [role definition](#) 27
  - [scope](#) 26
  - [securable object](#) 26
- [Authentication and security](#) 25
- [Authentication system](#) 26

### B

- [Base content types](#) 43
- Base data fields ([section 2.4.2](#) 30, [section 2.4.4](#) 34)
- [Base field types](#) 28
- Base rendering fields ([section 2.4.3](#) 34, [section 2.4.4](#) 34)
- [Base types - list](#) 35

### C

- [Change tracking](#) 59
- [Common data types and fields](#) 14
- [Common list item fields](#) 36
- [Configuration](#) 14
  - [administration object](#) 15
  - [administration Web service object](#) 15
  - [authentication and security](#) 25
  - [authentication system](#) 26
  - [content](#) 16
  - [content type](#) 19
  - [content Web service object](#) 15
  - [document](#) 20
  - [farm](#) 14
  - [feature](#) 25
  - [field](#) 19
  - [file](#) 17
  - [folder](#) 17
  - [generic list items](#) 22
  - [HTML user interface infrastructure](#) 23
  - [list](#) 18
  - [list definition](#) 25
  - [list item](#) 20
  - [managed path](#) 17
  - [metadict](#) 22
  - [namespace](#) 16
  - [Navigation structure](#) 23
  - [service](#) 15
  - [site](#) 18
  - [site collection](#) 17
  - [site definition](#) 24
  - [Web application](#) 15
  - [workflow](#) 22

- [Content](#) 16
- [Content type](#) 19
- [Content types](#) 43
  - [Document](#) 44
  - [folder](#) 44
  - [Item](#) 44
  - [System](#) 43
- [Content Web service object](#) 15

### D

- Data fields
  - [base data](#) 34
  - [base data fields](#) 30
  - [Data fields - discussion board](#) 40
  - [Data fields - document](#) 38
  - [Data fields - issue](#) 42
  - [Data fields - list](#) 38
  - [Data fields - list item](#) 36
  - [Data fields - survey](#) 41
- Data structures
  - [abstract](#) 14
  - [Data types and fields - common](#) 14
- Details
  - [base content types](#) 43
  - [common data types and fields](#) 14
  - [provisioning data structures](#) 24
  - [WorkflowStatus structure](#) 46
- [Discussion board](#) 40
- Document ([section 2.1.2.11](#) 20, [section 2.5.3](#) 38)
- [Document content type](#) 44
- [Document lookup](#) 30

### E

- Enumerations
  - [WorkflowEventType](#) 46
- [Examples](#) 54
  - [overview](#) 54
- Expressions
  - [function names](#) 48
  - [overview](#) 47
  - [syntax](#) 47
- [Extended field types](#) 30

### F

- [Farm](#) 14
- [Feature](#) 25
- [Field](#) 19
- Field types
  - [base field types](#) 28
  - [extended field types](#) 30
- Fields
  - [base data](#) 34
  - [base data fields](#) 30
  - [base rendering](#) 34
  - [base rendering fields](#) 34
  - [discussion board](#) 40
  - [discussion board data](#) 40
  - [discussion board HTML rendering](#) 40

- [document](#) 38
- [document data](#) 38
- [document HTML rendering](#) 39
- [document lookup](#) 30
- [generic list](#) 37
- [issue](#) 42
- [issue data](#) 42
- [issue HTML rendering](#) 43
- [list data](#) 38
- [list HTML rendering fields](#) 38
- [list item](#) 36
- [list item data](#) 36
- [list item HTML rendering](#) 37
- [survey](#) 41
- survey data ([section 2.4.6](#) 35, [section 2.5.5.1](#) 41)
- [survey HTML rendering](#) 42
- [XML document rendering fields](#) 35
- [Fields - security index](#) 56
- [Fields - vendor-extensible](#) 12
- [File](#) 17
- [File system object constraints](#) 27
- [Folder](#) 17
- [Folder content type](#) 44
- [Function names](#) 48

## G

- [Generic list](#) 37
- [Generic list items](#) 22
- [Glossary](#) 8
- [Group](#) 26

## H

- [HTML rendering fields - discussion board](#) 40
- [HTML rendering fields - document](#) 39
- [HTML rendering fields - issue](#) 43
- [HTML rendering fields - list](#) 38
- [HTML rendering fields - list item](#) 37
- [HTML rendering fields - survey](#) 42
- [HTML user interface infrastructure](#) 23

## I

- [Implementer - security considerations](#) 56
- [Index of security fields](#) 56
- [Informative references](#) 12
- [Introduction](#) 8
- [Issue](#) 42
- [Item content type](#) 44

## L

- [List](#) 18
- [List base types](#) 35
- [List definition](#) 25
- [List item](#) 20
- [List item - fields](#) 36
- [List template types](#) 45
- [Localization](#) 12

## M

- [Managed path](#) 17

- [Metadict](#) 22

## N

- [Namespace](#) 16
- [Navigation structure](#) 23
- [Normative references](#) 11

## O

- Object-level constraints
  - [file system object constraints](#) 27
  - [site constraints](#) 27
- [Overview \(synopsis\)](#) 12

## P

- [Permission](#) 27
- [Principal](#) 26
- [Product behavior](#) 57
- Provisioning data
  - [feature](#) 25
  - [list definition](#) 25
  - [site definition](#) 24
- [Provisioning data structures](#) 24

## R

- [Read my own, write my own](#) 27
- [References](#) 11
  - [informative](#) 12
  - [normative](#) 11
- [Relationship to protocols and other structures](#) 12
- Rendering
  - base rendering fields ([section 2.4.3](#) 34, [section 2.4.4](#) 34)
- [Role definition](#) 27

## S

- [Scope](#) 26
- [Securable object](#) 26
- Security
  - [authentication system](#) 26
  - [field index](#) 56
  - [group](#) 26
  - [implementer considerations](#) 56
  - [permission](#) 27
  - [principal](#) 26
  - [read my own, write my own](#) 27
  - [role definition](#) 27
  - [scope](#) 26
  - [securable object](#) 26
- [Service](#) 15
- [Site](#) 18
- [Site collection](#) 17
- [Site constraints](#) 27
- [Site definition](#) 24
- Structures
  - [base content types](#) 43
  - [feature](#) 25
  - [list definition](#) 25
  - [Navigation](#) 23
  - [overview](#) 14

[provisioning data](#) 24  
[site definition](#) 24  
[WorkflowStatus](#) 46  
[Survey](#) 41  
[Survey data fields](#) 35  
[Syntax](#) 47  
[System content type](#) 43

## T

Template types  
[list](#) 45  
[Tracking changes](#) 59

## V

[Vendor-extensible fields](#) 12  
[Versioning](#) 12

## W

[Web application](#) 15  
[Workflow](#) 22  
[WorkflowEventType enumeration](#) 46  
[WorkflowStatus structure](#) 46

## X

[XML document rendering fields](#) 35

Preliminary