OData Vocabularies Version 4.0

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Related work:

This specification is related to:

- *OData Version 4.02*. Edited by Michael Pizzo, Ralf Handl, and Heiko Theißen. A multi-part Work Product that includes:
  - *OData Version 4.02 Part 1: Protocol*. Latest stage. https://docs.oasis-open.org/odata/odata/v4.02/odata-v4.02-part1-protocol.html
  - *OData Version 4.02 Part 2: URL Conventions*. Latest stage. https://docs.oasis-open.org/odata/odata/v4.02/odata-v4.02-part2-url-conventions.html

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    - *ABNF components: OData ABNF Construction Rules Version 4.02 and OData ABNF Test Cases*. https://docs.oasis-open.org/odata/odata/v4.02/csd01/abnf/
- *OData Common Schema Definition Language (CSDL) JSON Representation Version 4.02*. Edited by Michael Pizzo, Ralf Handl, and Heiko Theißen. Latest stage: https://docs.oasis-open.org/odata/odata-csdl-json/v4.02/odata-csdl-json-v4.02.html
- *OData Common Schema Definition Language (CSDL) XML Representation Version 4.02*. Edited by Michael Pizzo, Ralf Handl, and Heiko Theißen. Latest stage: https://docs.oasis-open.org/odata/odata-csdl-xml/v4.02/odata-csdl-xml-v4.02.html
- *OData JSON Format Version 4.02*. Edited by Michael Pizzo, Ralf Handl, and Heiko Theißen. Latest stage: https://docs.oasis-open.org/odata/odata-json-format/v4.02/odata-json-format-v4.02.html
- *OData Data Aggregation Extension Version 4.0*. Edited by Ralf Handl, Hubert Heijkers, Gerald Krause, Michael Pizzo, Heiko Theißen, and Martin Zurmuehl. Latest stage: https://docs.oasis-open.org/odata/odata-data-aggregation-ext/v4.0/odata-data-aggregation-ext-v4.0.html
- *OData Extension for Temporal Data Version 4.0*. Edited by Ralf Handl, Hubert Heijkers, Gerald Krause, Michael Pizzo, Heiko Theißen, and Martin Zurmuehl. Latest stage: https://docs.oasis-open.org/odata/odata-temporal-ext/v4.0/odata-temporal-ext-v4.0.html

Abstract:

This prose specification describes a set of OData vocabularies maintained by the OASIS OData Technical Committee. These vocabulary components are continuously evolved. The latest work-in-progress revisions are available at the odata-vocabularies OASIS TC GitHub repository: https://github.com/oasis-tcs/odata-vocabularies.

Status:

This document was last revised or approved by the OASIS Open Data Protocol (OData) TC on the above date. The level of approval is also listed above. Check the “Latest stage” location noted above for possible later revisions of this document. Any other numbered Versions and other technical work produced by the Technical Committee (TC) are listed at https://groups.oasis-open.org/communities/tc-community-home2?CommunityKey=e7cac2a9-2d18-4640-b94d-018dc7d3f0e2#technical.

TC members should send comments on this specification to the TC’s email list. Any individual may submit comments to the TC by sending email to Technical-Committee-Comments@oasis-open.org. Please use a Subject line like “Comment on OData Vocabularies”.

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Note that any machine-readable content (Computer Language Definitions) declared Normative for this Work Product is provided in separate plain text files. In the event of a discrepancy between any such plain text file and display content in the Work Product’s prose narrative document(s), the content in the separate plain text file prevails.

Key words:

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “NOT RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in BCP 14 **[RFC2119]** and **[RFC8174]** when, and only when, they appear in all capitals, as shown here.

Citation format:

When referencing this specification the following citation format should be used:

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1 Introduction

OData provides the ability to decorate model elements of a schema and instances of data with descriptive elements called annotations. Annotations can be used to specify additional facts about an element, such as whether it is read-only, or to define a common concept, such as a person or a movie. Annotations consist of a term (the namespace-qualified name of the annotation being applied), a target (the element to which the term is applied), and a value. A set of related annotation terms with a common namespace comprises a Vocabulary. Shared vocabularies provide a powerful extensibility point for OData. Refer to the **[OData-Protocol]** and **[OData-CSDL]** specifications for more information on the use of vocabularies.

This prose specification describes a set of OData vocabularies maintained by the OASIS OData Technical Committee. It is one component of a Work Product that also includes the various vocabulary components. These vocabulary components are continuously evolved, the latest work-in-progress revisions are available at **[OData-Vocabs]**.

Other OData vocabularies may be created, shared, and maintained outside of this work product.

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2 Core Vocabulary

Namespace: Org.OData.Core.V1

Core terms needed to write vocabularies

Terms

Term	Type	Description
ODataVersions	String	A space-separated list of supported versions of the OData Protocol. As OData supports semantic versioning, clients can assume that services support all Minor versions up to and including any reported Minor version for a particular Major version. In order to interoperate with the greatest number of clients, OData services SHOULD separately advertise each minor version that they support.
SchemaVersion	String	Service-defined value representing the version of the schema. Services MAY use semantic versioning, but clients MUST NOT assume this is the case.
Revisions	[RevisionType]	List of revisions of a model element A model element may have multiple **`Modified`** revisions within the same or different major versions, and may have mulitple **`Added`** and/or **`Deprecated`** revisions with different major versions to signify changes made to multiple major versions of the service.
Description	String?	A brief description of a model element
LongDescription	String?	A long description of a model element
Links	[Link]	Links to related information
Example	ExampleValue	Example for an instance of the annotated model element (Example)
Messages	[MessageType]	Instance annotation for warning and info messages
ValueException	ValueExceptionType	The annotated value is problematic
ResourceException	ResourceExceptionType	The annotated instance within a success payload is problematic
DataModificationException	DataModificationExceptionType	A modification operation failed on the annotated instance or collection within a success payload
IsLanguageDependent	Tag	Properties and terms annotated with this term are language-dependent

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Term	Type	Description
RequiresType	String	Terms annotated with this term can only be applied to elements that have a type that is identical to or derived from the given type name
AppliesViaContainer	Tag	The target path of an annotation with the tagged term MUST start with an entity container or the annotation MUST be embedded within an entity container, entity set or singleton Services MAY additionally annotate a container-independent model element (entity type, property, navigation property) if allowed by the **`AppliesTo`** property of the term and the annotation applies to all uses of that model element.
ResourcePath	URL	Resource path for entity container child, can be relative to xml:base and the request URL
DereferenceableIDs	Tag	Entity-ids are URLs that locate the identified entity
ConventionalIDs	Tag	Entity-ids follow OData URL conventions
Permissions	Permission	Permissions for accessing a resource
ContentID	String	A unique identifier for nested entities within a request.
DefaultNamespace	Tag	Functions, actions and types in this namespace can be referenced in URLs with or without namespace- or alias- qualification. Data Modelers should ensure uniqueness of schema children across all default namespaces, and should avoid naming bound functions, actions, or derived types with the same name as a structural or navigational property of the type.
Immutable	Tag	A value for this non-key property can be provided by the client on insert and remains unchanged on update
Computed	Tag	A value for this property is generated on both insert and update
ComputedDefaultValue	Tag	A value for this property can be provided by the client on insert and update. If no value is provided on insert, a non-static default value is generated
IsURL	Tag	Properties and terms annotated with this term MUST contain a valid URL

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Term	Type	Description
AcceptableMediaTypes	[MediaType]	Lists the MIME types acceptable for the annotated entity type marked with HasStream="true" or the annotated binary, stream, or string property or term The annotation of a TypeDefinition propagates to the model elements having this type
MediaType	MediaType?	The media type of the media stream of the annotated entity type marked with HasStream="true" or the annotated binary, stream, or string property or term The annotation of a TypeDefinition propagates to the model elements having this type
IsMediaType	Tag	Properties and terms annotated with this term MUST contain a valid MIME type
ContentDisposition	ContentDispositionType	The content disposition of the media stream of the annotated entity type marked with HasStream="true" or the annotated binary, stream, or string property or term
OptimisticConcurrency	[PropertyPath]	Data modification requires the use of ETags. A non-empty collection contains the set of properties that are used to compute the ETag. An empty collection means that the service won't tell how it computes the ETag
AdditionalProperties	Tag	Instances of this type may contain properties in addition to those declared in $metadata If specified as false clients can assume that instances will not contain dynamic properties, irrespective of the value of the OpenType attribute.
AutoExpand	Tag	The service will automatically expand this stream property, navigation property, or the media stream of this media entity type even if not requested with $expand
AutoExpandReferences	Tag	The service will automatically expand this navigation property as entity references even if not requested with $expand=.../ref
MayImplement	[QualifiedTypeName]	A collection of qualified type names outside of the type hierarchy that instances of this type might be addressable as by using a type-cast segment.
Ordered	Tag	Collection has a stable order. Ordered collections of primitive or complex types can be indexed by ordinal.
PositionalInsert	Tag	Items can be inserted at a given ordinal index.
AlternateKeys	[AlternateKey]	Communicates available alternate keys

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Term	Type	Description
OptionalParameter	OptionalParameterType	Supplying a value for the action or function parameter is optional. All parameters marked as optional must come after any parameters not marked as optional. The binding parameter must not be marked as optional.
OperationAvailable	Boolean?	Action or function is available The annotation value will usually be an expression, e.g. using properties of the binding parameter type for instance-dependent availability, or using properties of a singleton for global availability. The static value **`null`** means that availability cannot be determined upfront and is instead expressed as an operation advertisement.
RequiresExplicitBinding	Tag?	This bound action or function is only available on model elements annotated with the ExplicitOperationBindings term or for instances where the operation is explicitly advertised in the payload.
ExplicitOperationBindings	[QualifiedBoundOperationName]	The qualified names of explicitly bound operations that are supported on the target model element. These operations are in addition to any operations not annotated with RequiresExplicitBinding that are bound to the type of the target model element.
SymbolicName	SimpleIdentifier	A symbolic name for a model element
GeometryFeature	GeometryFeatureType?	A Feature Object represents a spatially bounded thing
AnyStructure	Tag	Instances of a type are annotated with this tag if they have no common structure in a given response payload The select-list of a context URL MUST contain **`@Core.AnyStructure`** if it contains no structural properties, but this instance annotation SHOULD be omitted from the response value.
Constructor	Tag	On success the annotated action creates a new entity
IsDelta	Tag	The annotated Action or Function Parameter or Return Type is represented as a Delta payload The parameter or result is represented as a delta payload, which may include deleted entries as well as changes to related entities and relationships, according to the format-specific delta representation.

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Term	Type	Description
Subsets	NavigationPropertyPath?	The annotated navigation property subsets the referenced navigation property. Each entity reachable through the annotated navigation property is also reachable through the navigation property specified in the annotation. This term is inspired by the **`subsets`** UML constraint.

RevisionType

Property	Type	Description
Version	String?	The schema version with which this revision was first published
Kind	RevisionKind	The kind of revision
Description	String	Text describing the reason for the revision

RevisionKind

Member	Value	Description
Added	0	Model element was added
Modified	1	Model element was modified
Deprecated	2	Model element was deprecated

Link

The Link type is inspired by the **`atom:link`** element, see RFC4287, and the **`Link`** HTTP header, see RFC5988

Property	Type	Description
rel	String	Link relation type, see IANA Link Relations
href	URL	URL of related information

ExampleValue

Derived Types:

- PrimitiveExampleValue
- ComplexExampleValue
- EntityExampleValue
- ExternalExampleValue

Property	Type	Description
Description	String?	Description of the example value

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PrimitiveExampleValue: ExampleValue

Property	Type	Description
Description	String?	Description of the example value
Value	PrimitiveType	Example value for the custom parameter

ComplexExampleValue: ExampleValue

Property	Type	Description
Description	String?	Description of the example value
Value	ComplexType	Example value for the custom parameter

EntityExampleValue: ExampleValue

Property	Type	Description
Description	String?	Description of the example value
Value	EntityType	Example value for the custom parameter

ExternalExampleValue: ExampleValue

Property	Type	Description
Description	String?	Description of the example value
ExternalValue	URL	Url reference to the value in its literal format

MessageType

Property	Type	Description
code	String	Machine-readable, language-independent message code
message	String	Human-readable, language-dependent message text
severity	MessageSeverity	Severity of the message
target	String?	A path to the target of the message detail, relative to the annotated instance
details	[MessageType]	List of detail messages

MessageSeverity

Type: String

Allowed Value	Description
success	Positive feedback - no action required

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Allowed Value	Description
info	Additional information - no action required
warning	Warning - action may be required
error	Error - action is required

ExceptionType

Derived Types:

- ValueExceptionType
- ResourceExceptionType
- DataModificationExceptionType

Property	Type	Description
info	MessageType?	Information about the exception

ValueExceptionType: ExceptionType

Property	Type	Description
info	MessageType?	Information about the exception
value	String?	String representation of the exact value

ResourceExceptionType: ExceptionType

Property	Type	Description
info	MessageType?	Information about the exception
retryLink	URL?	A GET request to this URL retries retrieving the problematic instance

DataModificationExceptionType: ExceptionType

Property	Type	Description
info	MessageType?	Information about the exception
failedOperation	DataModificationOperationKind	The kind of modification operation that failed
responseCode	Int16?	Response code of the failed operation, e.g. 424 for a failed dependency

DataModificationOperationKind

Member	Value	Description
insert	0	Insert new instance

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Member	Value	Description
update	1	Update existing instance
upsert	2	Insert new instance or update it if it already exists
delete	3	Delete existing instance
invoke	4	Invoke action or function
link	5	Add link between entities
unlink	6	Remove link between entities

Tag

Type: Boolean

This is the type to use for all tagging terms

Permission

Flag Member	Value	Description
None	0	No permissions
Read	1	Read permission
Write	2	Write permission
ReadWrite	3	Read and write permission
Invoke	4	Permission to invoke actions

ContentDispositionType

Property	Type	Description
Type	String	The disposition type of the binary or stream value, see RFC 6266, Disposition Type
Filename	String?	The proposed filename for downloading the binary or stream value, see RFC 6266, Disposition Parameter: 'Filename'

QualifiedTermName

Type: String

The qualified name of a term in scope.

QualifiedTypeName

Type: String

The qualified name of a type in scope.

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QualifiedActionName

Type: String

The qualified name of an action in scope.

QualifiedBoundOperationName

Type: String

The qualified name of a bound action or function in scope.

Either

- the qualified name of an action, to indicate the single bound overload with the specified binding parameter type,
- the qualified name of a function, to indicate all bound overloads with the specified binding parameter type, or
- the qualified name of a function followed by parentheses containing a comma-separated list of parameter types, in the order of their definition, to identify a single function overload with the first (binding) parameter matching the specified parameter type.

AlternateKey

Property	Type	Description
Key	[PropertyRef]	The set of properties that make up this key

PropertyRef

Property	Type	Description
Name	PropertyPath	A path expression resolving to a primitive property of the entity type itself or to a primitive property of a complex or navigation property (recursively) of the entity type. The names of the properties in the path are joined together by forward slashes.
Alias	String?	A SimpleIdentifier that MUST be unique within the set of aliases, structural and navigation properties of the containing entity type that MUST be used in the key predicate of URLs

Dictionary

A dictionary of name-value pairs. Names must be valid property names, values may be restricted to a list of types via an annotation with term **`Validation.OpenPropertyTypeConstraint`**.

Property	Type
Any simple identifier	Any type listed in **`Validation.OpenPropertyTypeConstraint`**, or any type if there is no constraint

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OptionalParameterType

Property	Type	Description
DefaultValue	String?	Default value for an optional parameter of primitive or enumeration type, using the same rules as the **`cast`** function in URLs. If no explicit DefaultValue is specified, the service is free on how to interpret omitting the parameter from the request. For example, a service might interpret an omitted optional parameter **`KeyDate`** as having the current date.

LocalDateTime

Type: String

A string representing a Local Date-Time value with no offset.

SimpleIdentifier

Type: String

A **[simple identifier]**

GeometryFeatureType

A Feature Object represents a spatially bounded thing

Property	Type	Description
geometry	Geometry?	Location of the Feature
properties	Dictionary?	Properties of the Feature
id	String?	Commonly used identifer for a Feature

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3 Capabilities Vocabulary

Namespace: Org.OData.Capabilities.V1

Terms describing capabilities of a service

There are some capabilities which are strongly recommended for services to support even though they are optional. Support for $top and $skip is a good example as supporting these query options helps with performance of a service and are essential. Such capabilities are assumed to be default capabilities of an OData service even in the case that a capabilities annotation doesn't exist. Capabilities annotations are mainly expected to be used to explicitly specify that a service doesn't support such capabilities. Capabilities annotations can as well be used to declaratively specify the support of such capabilities.

On the other hand, there are some capabilities that a service may choose to support or not support and in varying degrees. $filter and $orderby are such good examples. This vocabulary aims to define terms to specify support or no support for such capabilities.

A service is assumed to support by default the following capabilities even though an annotation doesn't exist:

- Countability ($count)
- Client pageability ($top, $skip)
- Expandability ($expand)
- Indexability by key
- Batch support ($batch)
- Navigability of navigation properties

A service is expected to support the following capabilities. If not supported, the service is expected to call out the restrictions using annotations:

- Filterability ($filter)
- Sortability ($orderby)
- Queryability of top level entity sets
- Query functions

A client cannot assume that a service supports certain capabilities. A client can try, but it needs to be prepared to handle an error in case the following capabilities are not supported:

- Insertability
- Updatability
- Deletability

Capabilities annotations can be given through three mechanisms:

- embedded within a model element **`edm:EntitySet`** or **`edm:Singleton`**; let T then be the path from the container to that model element
- with an external annotation target T starting with a container and targeting a collection
- a **`Capabilities.NavigationRestrictions`** annotation with a **`RestrictedProperties/NavigationProperty`**; let T then be the concatenation of
  - the annotation target in the case of external targeting, otherwise the path from the container to the entity set or singleton in which the annotation is embedded
  - and the navigation property path in **`RestrictedProperties/NavigationProperty`**.

It is an error to specify conflicting restrictions of the same capability with the same T. A resource path *matches* T if it contains the same non-container, non-key segments in the same order as T.

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If T contains no non-containment navigation property, then resource paths matching T are canonical in the sense of [OData-URL, sections 4.3.1 and 4.3.2]. A capabilities annotation with such a T applies to every entity that can be addressed by a canonical resource path matching T, even when it is addressed via another, non-canonical, resource path.

If T contains at least one non-containment navigation property, the capabilities annotation is specific to resource paths matching T, such resource paths are non-canonical. Restrictions in such capabilities annotations take precedence over any restrictions from capabilities annotations where T matches the canonical resource path.

Terms

Term	Type	Description
ConformanceLevel	ConformanceLevelType	The conformance level achieved by this service
SupportedFormats	[MediaType]	Media types of supported formats, including format parameters
SupportedMetadataFormats	[MediaType]	Media types of supported formats for $metadata, including format parameters
AcceptableEncodings	[String]	List of acceptable compression methods for ($batch) requests, e.g. gzip
AsynchronousRequestsSupported	Tag	Service supports the asynchronous request preference
BatchContinueOnErrorSupported *(Deprecated)*	Tag	Deprecated in favor of the `ContinueOnErrorSupported` property from the `BatchSupport` term
IsolationSupported	IsolationLevel	Supported odata.isolation levels
CrossJoinSupported	Tag	Supports cross joins for the entity sets in this container
CallbackSupported	CallbackType	Supports callbacks for the specified protocols
ChangeTracking	ChangeTrackingType	Change tracking capabilities of this service or entity set
CountRestrictions	CountRestrictionsType	Restrictions on /$count path suffix and $count=true system query option
NavigationRestrictions	NavigationRestrictionsType	Restrictions on navigating properties according to OData URL conventions
IndexableByKey	Tag	Supports key values according to OData URL conventions
TopSupported	Tag	Supports $top
SkipSupported	Tag	Supports $skip

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Term	Type	Description
ComputeSupported	Tag	Supports $compute
SelectSupport	SelectSupportType	Support for $select and nested query options within $select
BatchSupported	Tag	Supports $batch requests. Services that apply the BatchSupported term should also apply the more comprehensive BatchSupport term.
BatchSupport	BatchSupportType	Batch Support for the service
FilterFunctions	[String]	List of functions and operators supported in filter expressions If not specified, null, or empty, all functions and operators may be attempted.
FilterRestrictions	FilterRestrictionsType	Restrictions on filter expressions
SortRestrictions	SortRestrictionsType	Restrictions on orderby expressions
ExpandRestrictions	ExpandRestrictionsType	Restrictions on expand expressions
SearchRestrictions	SearchRestrictionsType	Restrictions on search expressions
KeyAsSegmentSupported	Tag	Supports key-as-segment convention for addressing entities within a collection
QuerySegmentSupported	Tag	Supports passing query options in the request body
InsertRestrictions	InsertRestrictionsType	Restrictions on insert operations
DeepInsertSupport	DeepInsertSupportType?	Deep Insert Support of the annotated resource (the whole service, an entity set, or a collection-valued resource)
UpdateRestrictions	UpdateRestrictionsType	Restrictions on update operations
DeepUpdateSupport	DeepUpdateSupportType	Deep Update Support of the annotated resource (the whole service, an entity set, or a collection-valued resource)
DeleteRestrictions	DeleteRestrictionsType	Restrictions on delete operations
CollectionPropertyRestrictions	[CollectionPropertyRestrictionsType]	Describes restrictions on operations applied to collection-valued structural properties
OperationRestrictions	OperationRestrictionsType	Restrictions for function or action operation

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Term	Type	Description
AnnotationValuesInQuerySupported	Tag	Supports annotation values within system query options
ModificationQueryOptions	ModificationQueryOptionsType	Support for query options with modification requests (insert, update, action invocation)
ReadRestrictions	ReadRestrictionsType	Restrictions for retrieving a collection of entities, retrieving a singleton instance.
CustomHeaders	[CustomParameter]	Custom headers that are supported/required for the annotated resource (Example)
CustomQueryOptions	[CustomParameter]	Custom query options that are supported/required for the annotated resource (Example) If the entity container is annotated, the query option is supported/required by all resources in that container.
MediaLocationUpdateSupported	Tag	Stream property or media stream supports update of its media edit URL and/or media read URL

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Term	Type	Description
DefaultCapabilities	DefaultCapabilitiesType	Default capability settings for all collection-valued resources in the container Annotating a specific capability term, which is included as property in **`DefaultCapabilitiesType`**, for a specific collection-valued resource overrides the default capability with the specified properties using PATCH semantics: • Primitive or collection-valued properties specified in the specific capability term replace the corresponding properties specified in **`DefaultCapabilities`** • Complex-valued properties specified in the specific capability term override the corresponding properties specified in **`DefaultCapabilities`** using PATCH semantics recursively • Properties specified neither in the specific term nor in **`DefaultCapabilities`** have their default value

ConformanceLevelType

Member	Value	Description
Minimal	0	Minimal conformance level
Intermediate	1	Intermediate conformance level
Advanced	2	Advanced conformance level

IsolationLevel

Flag Member	Value	Description
Snapshot	1	All data returned for a request, including multiple requests within a batch or results retrieved across multiple pages, will be consistent as of a single point in time

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CallbackType

A non-empty collection lists the full set of supported protocols. A empty collection means ‘only HTTP is supported’

Property	Type	Description
CallbackProtocols	[CallbackProtocol]	List of supported callback protocols, e.g. **`http`** or **`wss`**

CallbackProtocol

Property	Type	Description
Id	String?	Protocol Identifier
UrlTemplate	String?	URL Template including parameters. Parameters are enclosed in curly braces {} as defined in RFC6570
DocumentationUrl	URL?	Human readable description of the meaning of the URL Template parameters

ChangeTrackingBase

Derived Types:

- ChangeTrackingType

Property	Type	Description
Supported	Boolean	odata.track-changes preference is supported

ChangeTrackingType: ChangeTrackingBase

Property	Type	Description
Supported	Boolean	odata.track-changes preference is supported
FilterableProperties	[PropertyPath]	Change tracking supports filters on these properties If no properties are specified or FilterableProperties is omitted, clients cannot assume support for filtering on any properties in combination with change tracking.
ExpandableProperties	[NavigationPropertyPath]	Change tracking supports these properties expanded If no properties are specified or ExpandableProperties is omitted, clients cannot assume support for expanding any properties in combination with change tracking.

CountRestrictionsBase

Derived Types:

- CountRestrictionsType

Property	Type	Description
Countable	Boolean	Instances can be counted in requests targeting a collection

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Property	Type	Description
InlineCountAccuracy	CountAccuracy?	The default accuracy for inline count

CountRestrictionsType: CountRestrictionsBase

Property	Type	Description
Countable	Boolean	Instances can be counted in requests targeting a collection
InlineCountAccuracy	CountAccuracy?	The default accuracy for inline count
NonCountableProperties	[PropertyPath]	Members of these collection properties cannot be counted
NonCountableNavigationProperties	[NavigationPropertyPath]	Members of these navigation properties cannot be counted

CountAccuracy

Type: String

The accuracy of the count value

```
        Note that additional values may be defined in the future. Clients should treat any unknown
value as an inexact count.
        If the service changes the default accuracy from `counted` to any other value, it MUST return
the actual count accuracy
        in responses to preserve backward compatibility with existing clients.
```

Allowed Value	Description
counted	The count was exact at the time of calculation
estimated	The count was estimated
cached	The count was based on cached values and may no longer be current
partial	The collection contained at least the returned number of items at the time of calculation
unavailable	The count was unavailable and the count value returned (typically 0) should be ignored

NavigationRestrictionsType

Property	Type	Description
Navigability	NavigationType?	Default navigability for all navigation properties of the annotation target. Individual navigation properties can override this value via **`RestrictedProperties/Navigability`**.
RestrictedProperties	[NavigationPropertyRestriction]	List of navigation properties with restrictions

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NavigationPropertyRestriction

Using a property of **`NavigationPropertyRestriction`** in a **`NavigationRestrictions`** annotation is discouraged in favor of using an annotation with the corresponding term from this vocabulary and a target path starting with a container and ending in the **`NavigationProperty`**, unless the favored alternative is impossible because a dynamic expression requires an instance path whose evaluation starts at the target of the **`NavigationRestrictions`** annotation. See this example.

Property	Type	Description
NavigationProperty	NavigationPropertyPath	Navigation properties can be navigated The target path of a `NavigationRestrictions` annotation followed by this navigation property path addresses the resource to which the other properties of **`NavigationPropertyRestriction`** apply. Instance paths that occur in dynamic expressions are evaluated starting at the boundary between both paths, which must therefore be chosen accordingly.
Navigability	NavigationType?	Supported navigability of this navigation property
FilterFunctions	[String]	List of functions and operators supported in filter expressions If not specified, null, or empty, all functions and operators may be attempted.
FilterRestrictions	FilterRestrictionsType?	Restrictions on filter expressions
SearchRestrictions	SearchRestrictionsType?	Restrictions on search expressions
SortRestrictions	SortRestrictionsType?	Restrictions on orderby expressions
TopSupported	Boolean	Supports $top
SkipSupported	Boolean	Supports $skip
SelectSupport	SelectSupportType?	Support for $select
IndexableByKey	Boolean	Supports key values according to OData URL conventions
InsertRestrictions	InsertRestrictionsType?	Restrictions on insert operations
DeepInsertSupport	DeepInsertSupportType?	Deep Insert Support of the annotated resource (the whole service, an entity set, or a collection-valued resource)
UpdateRestrictions	UpdateRestrictionsType?	Restrictions on update operations
DeepUpdateSupport	DeepUpdateSupportType?	Deep Update Support of the annotated resource (the whole service, an entity set, or a collection-valued resource)
DeleteRestrictions	DeleteRestrictionsType?	Restrictions on delete operations

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Property	Type	Description
OptimisticConcurrencyControl	Boolean	Data modification (including insert) along this navigation property requires the use of ETags
ReadRestrictions	ReadRestrictionsType?	Restrictions for retrieving entities

NavigationType

Member	Value	Description
Recursive	0	Navigation properties can be recursively navigated
Single	1	Navigation properties can be navigated to a single level
None	2	Navigation properties are not navigable

SelectSupportType

Property	Type	Description
Supported	Boolean	Supports $select
InstanceAnnotationsSupported	Boolean	Supports instance annotations in $select list
Expandable	Boolean	$expand within $select is supported
Filterable	Boolean	$filter within $select is supported
Searchable	Boolean	$search within $select is supported
TopSupported	Boolean	$top within $select is supported
SkipSupported	Boolean	$skip within $select is supported
ComputeSupported	Boolean	$compute within $select is supported
Countable	Boolean	$count within $select is supported
Sortable	Boolean	$orderby within $select is supported

BatchSupportType

Property	Type	Description
Supported	Boolean	Service supports requests to $batch
ContinueOnErrorSupported	Boolean	Service supports the **`continue-on-error`** preference When the client specifies the **`continue-on-error`** preference, the service applies it by processing all requests according to their dependencies, regardless of the format for the $batch request.

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Property	Type	Description
ReferencesInRequestBodiesSupported	Boolean	Service supports Content-ID referencing in request bodies
ReferencesAcrossChangeSetsSupported	Boolean	Service supports Content-ID referencing across change sets
EtagReferencesSupported	Boolean	Service supports referencing Etags from previous requests
RequestDependencyConditionsSupported	Boolean	Service supports the `if` member in JSON batch requests
SupportedFormats	[MediaType]	Media types of supported formats for $batch Allowed Values: multipart/mixed Multipart Batch Format application/json JSON Batch Format

Applicable Annotation Terms:

- Description
- LongDescription

FilterRestrictionsBase

Derived Types:

- FilterRestrictionsType

Property	Type	Description
Filterable	Boolean	$filter is supported
RequiresFilter	Boolean	$filter is required
MaxLevels	Int32	The maximum number of levels (including recursion) that can be traversed in a filter expression. A value of -1 indicates there is no restriction.

Applicable Annotation Terms:

- Description

FilterRestrictionsType: FilterRestrictionsBase

Property	Type	Description
Filterable	Boolean	$filter is supported
RequiresFilter	Boolean	$filter is required

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Property	Type	Description
MaxLevels	Int32	The maximum number of levels (including recursion) that can be traversed in a filter expression. A value of -1 indicates there is no restriction.
RequiredProperties	[PropertyPath]	These properties must be specified in the $filter clause (properties of derived types are not allowed here)
NonFilterableProperties	[PropertyPath]	These structural properties cannot be used in filter expressions
FilterExpressionRestrictions	[FilterExpressionRestrictionType]	These properties only allow a subset of filter expressions. A valid filter expression for a single property can be enclosed in parentheses and combined by **`and`** with valid expressions for other properties.

Applicable Annotation Terms:

- Description

FilterExpressionRestrictionType

Property	Type	Description
Property	PropertyPath?	Path to the restricted property
AllowedExpressions	FilterExpressionType?	Allowed subset of expressions

FilterExpressionType

Type: String

Allowed Value	Description
SingleValue	Property can be used in a single **`eq`** clause
MultiValue	Property can be used in multiple **`eq`** and **`in`** clauses, combined by **`or`** (which is logically equivalent to a single **`in`** clause)
SingleRange	Property can be compared to a single closed, half-open, or open interval The filter expression for this property consists of a single interval expression, which is either a single comparison of the property and a literal value with **`eq`**, **`le`**, **`lt`**, **`ge`**, or **`gt`**, or a pair of boundaries combined by **`and`**. The lower boundary is either **`ge`** or **`gt`**, the upper boundary either **`le`** or **`lt`**.

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Allowed Value	Description
MultiRange	Property can be compared to a union of one or more closed, half-open, or open intervals The filter expression for this property consists of one or more interval expressions, combined by **`or`**. See SingleRange for the definition of an interval expression. Alternatively the filter expression can consist of one or more **`ne`** expressions combined by **`and`**, which is roughly equivalent to the union of the complementing open intervals. Roughly equivalent because **`null`** is allowed as a right-side operand of an **`ne`** expression.
SearchExpression	String property can be used as first operand in one or more **`startswith`**, **`endswith`**, and **`contains`** clauses, combined by **`or`**
MultiValueOrSearchExpression	String property can be used like in **`MultiValue`** and like in **`SearchExpression`**, combined with **`or`**
MultiRangeOrSearchExpression	Property can be compared to a union of zero or more closed, half-open, or open intervals plus zero or more simple string patterns The filter expression for this property consists of one or more interval expressions or string comparison functions combined by **`or`**. See SingleRange for the definition of an interval expression. See SearchExpression for the allowed string comparison functions.

SortRestrictionsBase

Derived Types:

- SortRestrictionsType

Property	Type	Description
Sortable	Boolean	$orderby is supported

Applicable Annotation Terms:

- Description

SortRestrictionsType: SortRestrictionsBase

Property	Type	Description
Sortable	Boolean	$orderby is supported
AscendingOnlyProperties	[PropertyPath]	These properties can only be used for sorting in Ascending order
DescendingOnlyProperties	[PropertyPath]	These properties can only be used for sorting in Descending order
NonSortableProperties	[PropertyPath]	These structural properties cannot be used in orderby expressions

Applicable Annotation Terms:

- Description

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ExpandRestrictionsBase

Derived Types:

- ExpandCollectionRestrictionsType
  - ExpandRestrictionsType
- ExpandByKeyRestrictionsBase
  - ExpandByKeyRestrictionsType

Property	Type	Description
Expandable	Boolean	$expand is supported
StreamsExpandable	Boolean	$expand is supported for stream properties and media streams
MaxLevels	Int32	The maximum number of levels that can be expanded in a expand expression. A value of -1 indicates there is no restriction.

Applicable Annotation Terms:

- Description

ExpandCollectionRestrictionsType: ExpandRestrictionsBase

Derived Types:

- ExpandRestrictionsType

Property	Type	Description
Expandable	Boolean	$expand is supported
StreamsExpandable	Boolean	$expand is supported for stream properties and media streams
MaxLevels	Int32	The maximum number of levels that can be expanded in a expand expression. A value of -1 indicates there is no restriction.
ExpandByKeyRestrictions	ExpandByKeyRestrictionsBase?	Restrictions on expand expressions when accessed by key Restrictions on expand expressions when accessing a member of the collection by key. SHOULD be Null (or unspecified) for single-valued targets. If Null for collection-valued targets, then the same expand capabilities when accessing the collection apply when accessing an instance within the collection by key. Different non-expandable navigation or stream properties from the target collection can be specified by providing an instance of the derived **`ExpandByKeyRestrictionsType`**. Otherwise, the same set of non-expandable navigation and stream properties specified for the collection apply when accessing an instance within the collection by key.

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Applicable Annotation Terms:

- Description

ExpandRestrictionsType: ExpandCollectionRestrictionsType

Property	Type	Description
Expandable	Boolean	$expand is supported
StreamsExpandable	Boolean	$expand is supported for stream properties and media streams
MaxLevels	Int32	The maximum number of levels that can be expanded in a expand expression. A value of -1 indicates there is no restriction.
ExpandByKeyRestrictions	ExpandByKeyRestrictionsBase?	Restrictions on expand expressions when accessed by key Restrictions on expand expressions when accessing a member of the collection by key. SHOULD be Null (or unspecified) for single-valued targets. If Null for collection-valued targets, then the same expand capabilities when accessing the collection apply when accessing an instance within the collection by key. Different non-expandable navigation or stream properties from the target collection can be specified by providing an instance of the derived **`ExpandByKeyRestrictionsType`**. Otherwise, the same set of non-expandable navigation and stream properties specified for the collection apply when accessing an instance within the collection by key.
NonExpandableProperties	[NavigationPropertyPath]	These properties cannot be used in expand expressions
NonExpandableStreamProperties	[PropertyPath]	These stream properties cannot be used in expand expressions

Applicable Annotation Terms:

- Description

ExpandByKeyRestrictionsBase: ExpandRestrictionsBase

Derived Types:

- ExpandByKeyRestrictionsType

Property	Type	Description
Expandable	Boolean	$expand is supported

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Property	Type	Description
StreamsExpandable	Boolean	$expand is supported for stream properties and media streams
MaxLevels	Int32	The maximum number of levels that can be expanded in a expand expression. A value of -1 indicates there is no restriction.

Applicable Annotation Terms:

- Description

ExpandByKeyRestrictionsType: ExpandByKeyRestrictionsBase

Property	Type	Description
Expandable	Boolean	$expand is supported
StreamsExpandable	Boolean	$expand is supported for stream properties and media streams
MaxLevels	Int32	The maximum number of levels that can be expanded in a expand expression. A value of -1 indicates there is no restriction.
NonExpandableProperties	[NavigationPropertyPath]	These properties cannot be used in expand expressions when accessing by key
NonExpandableStreamProperties	[PropertyPath]	These stream properties cannot be used in expand expressions when accessing by key

Applicable Annotation Terms:

- Description

SearchRestrictionsType

Property	Type	Description
Searchable	Boolean	$search is supported
UnsupportedExpressions	SearchExpressions	Expressions not supported in $search as specified by the standard syntax **[OData-URL, section 5.1.8.1]** An unsupported expression may be treated as a term to be matched even if the standard syntax treats it as a keyword.
SearchSyntax	URL?	URL of the $search syntax supported by the service (null means the standard syntax **[OData-URL, section 5.1.8.1]**)

Applicable Annotation Terms:

- Description

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SearchExpressions

Flag Member	Value	Description
none	0	No unsupported expressions
AND	1	Multiple search terms, optionally separated by **AND**
OR	2	Multiple search terms separated by **OR**
NOT	4	Search terms preceded by **NOT**
phrase	8	Search phrases enclosed in double quotes
group	16	Precedence grouping of search expressions with parentheses

InsertRestrictionsBase

Derived Types:

- InsertRestrictionsType

Property	Type	Description
Insertable	Boolean	Entities can be inserted
MaxLevels	Int32	The maximum number of navigation properties that can be traversed when addressing the collection to insert into. A value of -1 indicates there is no restriction.
TypecastSegmentSupported	Boolean	Entities of a specific derived type can be created by specifying a type-cast segment
QueryOptions	ModificationQueryOptionsType?	Support for query options with insert requests
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.

InsertRestrictionsType: InsertRestrictionsBase

Property	Type	Description
Insertable	Boolean	Entities can be inserted

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Property	Type	Description
MaxLevels	Int32	The maximum number of navigation properties that can be traversed when addressing the collection to insert into. A value of -1 indicates there is no restriction.
TypecastSegmentSupported	Boolean	Entities of a specific derived type can be created by specifying a type-cast segment
QueryOptions	ModificationQueryOptionsType?	Support for query options with insert requests
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.
NonInsertableProperties	[PropertyPath]	These structural properties cannot be specified on insert
NonInsertableNavigationProperties	[NavigationPropertyPath]	These navigation properties do not allow deep inserts
RequiredProperties	[PropertyPath]	These structural properties must be specified on insert
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to perform the insert.

PermissionType

Property	Type	Description
SchemeName	SchemeName	Authorization flow scheme name
Scopes	[ScopeType]	List of scopes that can provide access to the resource

ScopeType

Property	Type	Description
Scope	String	Name of the scope.

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Property	Type	Description
RestrictedProperties	String?	Comma-separated string value of all properties that will be included or excluded when using the scope. Possible string value identifiers when specifying properties are **`*`**, *PropertyName*, **`-`***PropertyName*. **`*`** denotes all properties are accessible. **`-`***PropertyName* excludes that specific property. *PropertyName* explicitly provides access to the specific property. The absence of **`RestrictedProperties`** denotes all properties are accessible using that scope.

DeepInsertSupportType

Property	Type	Description
Supported	Boolean	Annotation target supports deep inserts
ContentIDSupported	Boolean	Annotation target supports accepting and returning nested entities annotated with the **`Core.ContentID`** instance annotation.

UpdateRestrictionsBase

Derived Types:

- UpdateRestrictionsType

Property	Type	Description
Updatable	Boolean	Entities can be updated
Upsertable	Boolean	Entities can be upserted
DeltaUpdateSupported	Boolean	Entities can be inserted, updated, and deleted via a PATCH request with a delta payload
UpdateMethod	HttpMethod?	Supported HTTP Methods (PUT or PATCH) for updating an entity. If null, PATCH SHOULD be supported and PUT MAY be supported.
FilterSegmentSupported	Boolean	Members of collections can be updated via a PATCH request with a **`/$filter(...)/$each`** segment
TypecastSegmentSupported	Boolean	Members of collections can be updated via a PATCH request with a type-cast segment and a **`/$each`** segment
MaxLevels	Int32	The maximum number of navigation properties that can be traversed when addressing the collection or entity to update. A value of -1 indicates there is no restriction.

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Property	Type	Description
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to perform the update.
QueryOptions	ModificationQueryOptionsType?	Support for query options with update requests
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.

UpdateRestrictionsType: UpdateRestrictionsBase

Property	Type	Description
Updatable	Boolean	Entities can be updated
Upsertable	Boolean	Entities can be upserted
DeltaUpdateSupported	Boolean	Entities can be inserted, updated, and deleted via a PATCH request with a delta payload
UpdateMethod	HttpMethod?	Supported HTTP Methods (PUT or PATCH) for updating an entity. If null, PATCH SHOULD be supported and PUT MAY be supported.
FilterSegmentSupported	Boolean	Members of collections can be updated via a PATCH request with a **`/$filter(...)/$each`** segment
TypecastSegmentSupported	Boolean	Members of collections can be updated via a PATCH request with a type-cast segment and a **`/$each`** segment
MaxLevels	Int32	The maximum number of navigation properties that can be traversed when addressing the collection or entity to update. A value of -1 indicates there is no restriction.
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to perform the update.
QueryOptions	ModificationQueryOptionsType?	Support for query options with update requests

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Property	Type	Description
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.
NonUpdatableProperties	[PropertyPath]	These structural properties cannot be specified on update
NonUpdatableNavigationProperties	[NavigationPropertyPath]	These navigation properties do not allow rebinding
RequiredProperties	[PropertyPath]	These structural properties must be specified on update

HttpMethod

Flag Member	Value	Description
GET	1	The HTTP GET Method
PATCH	2	The HTTP PATCH Method
PUT	4	The HTTP PUT Method
POST	8	The HTTP POST Method
DELETE	16	The HTTP DELETE Method
OPTIONS	32	The HTTP OPTIONS Method
HEAD	64	The HTTP HEAD Method

DeepUpdateSupportType

Property	Type	Description
Supported	Boolean	Annotation target supports deep updates
ContentIDSupported	Boolean	Annotation target supports accepting and returning nested entities annotated with the `Core.ContentID` instance annotation.

DeleteRestrictionsBase

Derived Types:

- DeleteRestrictionsType

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Property	Type	Description
Deletable	Boolean	Entities can be deleted
MaxLevels	Int32	The maximum number of navigation properties that can be traversed when addressing the collection to delete from or the entity to delete. A value of -1 indicates there is no restriction.
FilterSegmentSupported	Boolean	Members of collections can be deleted via a DELETE request with a **`/$filter(...)/$each`** segment
TypecastSegmentSupported	Boolean	Members of collections can be deleted via a DELETE request with a type-cast segment and a **`/$each`** segment
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to perform the delete.
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.

DeleteRestrictionsType: DeleteRestrictionsBase

Property	Type	Description
Deletable	Boolean	Entities can be deleted
MaxLevels	Int32	The maximum number of navigation properties that can be traversed when addressing the collection to delete from or the entity to delete. A value of -1 indicates there is no restriction.
FilterSegmentSupported	Boolean	Members of collections can be deleted via a DELETE request with a **`/$filter(...)/$each`** segment
TypecastSegmentSupported	Boolean	Members of collections can be deleted via a DELETE request with a type-cast segment and a **`/$each`** segment
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to perform the delete.
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request

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Property	Type	Description
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.
NonDeletableNavigationProperties	[NavigationPropertyPath]	These navigation properties do not allow DeleteLink requests

CollectionPropertyRestrictionsType

Property	Type	Description
CollectionProperty	PropertyPath?	Restricted Collection-valued property
FilterFunctions	[String]	List of functions and operators supported in filter expressions If not specified, null, or empty, all functions and operators may be attempted.
FilterRestrictions	FilterRestrictionsType?	Restrictions on filter expressions
SearchRestrictions	SearchRestrictionsType?	Restrictions on search expressions
SortRestrictions	SortRestrictionsType?	Restrictions on orderby expressions
TopSupported	Boolean	Supports $top
SkipSupported	Boolean	Supports $skip
SelectSupport	SelectSupportType?	Support for $select
Insertable	Boolean	Members can be inserted into this collection If additionally annotated with Core.PositionalInsert, members can be inserted at a specific position
Updatable	Boolean	Members of this ordered collection can be updated by ordinal
Deletable	Boolean	Members of this ordered collection can be deleted by ordinal

OperationRestrictionsType

Property	Type	Description
FilterSegmentSupported	Boolean	Bound action or function can be invoked on a collection-valued binding parameter path with a `/$filter(...)` segment
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to invoke an action or function
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.

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ModificationQueryOptionsType

Property	Type	Description
ExpandSupported	Boolean	Supports $expand with modification requests
SelectSupported	Boolean	Supports $select with modification requests
ComputeSupported	Boolean	Supports $compute with modification requests
FilterSupported	Boolean	Supports $filter with modification requests
SearchSupported	Boolean	Supports $search with modification requests
SortSupported	Boolean	Supports $orderby with modification requests

ReadRestrictionsBase

Derived Types:

- ReadByKeyRestrictionsType
- ReadRestrictionsType

Property	Type	Description
Readable	Boolean	Entities can be retrieved
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to read.
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.

ReadByKeyRestrictionsType: ReadRestrictionsBase

Restrictions for retrieving an entity by key

Property	Type	Description
Readable	Boolean	Entities can be retrieved
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to read.
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request

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Property	Type	Description
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.

ReadRestrictionsType: ReadRestrictionsBase

Property	Type	Description
Readable	Boolean	Entities can be retrieved
Permissions	[PermissionType?]	Required permissions. One of the specified sets of scopes is required to read.
CustomHeaders	[CustomParameter]	Supported or required custom headers
CustomQueryOptions	[CustomParameter]	Supported or required custom query options
Description	String?	A brief description of the request
LongDescription	String?	A long description of the request
ErrorResponses	[HttpResponse]	Possible error responses returned by the request.
TypecastSegmentSupported	Boolean	Entities of a specific derived type can be read by specifying a type-cast segment
ReadByKeyRestrictions	ReadByKeyRestrictionsType?	Restrictions for retrieving an entity by key Only valid when applied to a collection. If a property of **`ReadByKeyRestrictions`** is not specified, the corresponding property value of **`ReadRestrictions`** applies.

CustomParameter

A custom parameter is either a header or a query option

The type of a custom parameter is always a string. Restrictions on the parameter values can be expressed by annotating the record expression describing the parameter with terms from the Validation vocabulary, e.g. Validation.Pattern or Validation.AllowedValues.

Property	Type	Description
Name	String	Name of the custom parameter
Description	String?	Description of the custom parameter
DocumentationURL	URL?	URL of related documentation
Required	Boolean	true: parameter is required, false or not specified: parameter is optional
ExampleValues	[PrimitiveExampleValue]	Example values for the custom parameter

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DefaultCapabilitiesType

Property	Type	Description
ChangeTracking	ChangeTrackingBase?	Change tracking capabilities
CountRestrictions	CountRestrictionsBase?	Restrictions on /$count path suffix and $count=true system query option
IndexableByKey	Tag?	Supports key values according to OData URL conventions
TopSupported	Tag?	Supports $top
SkipSupported	Tag?	Supports $skip
ComputeSupported	Tag?	Supports $compute
SelectSupport	SelectSupportType?	Support for $select and nested query options within $select
FilterRestrictions	FilterRestrictionsBase?	Restrictions on filter expressions
SortRestrictions	SortRestrictionsBase?	Restrictions on orderby expressions
ExpandRestrictions	ExpandRestrictionsBase?	Restrictions on expand expressions
SearchRestrictions	SearchRestrictionsType?	Restrictions on search expressions
InsertRestrictions	InsertRestrictionsBase?	Restrictions on insert operations
UpdateRestrictions	UpdateRestrictionsBase?	Restrictions on update operations
DeleteRestrictions	DeleteRestrictionsBase?	Restrictions on delete operations
OperationRestrictions	OperationRestrictionsType?	Restrictions for function or action operations
ReadRestrictions	ReadRestrictionsType?	Restrictions for retrieving a collection of entities, retrieving a singleton instance

HttpResponse

Property	Type	Description
StatusCode	String	HTTP response status code, for example 400, 403, 501
Description	String	Human-readable description of the response

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4 Measures Vocabulary

Namespace: Org.OData.Measures.V1

Terms describing monetary amounts and measured quantities

Terms

Term	Type	Description
ISOCurrency	String	The currency for this monetary amount as an ISO 4217 currency code
Scale	Byte	The number of significant decimal places in the scale part (less than or equal to the number declared in the Scale facet)
Unit	String	The unit of measure for this measured quantity, e.g. cm for centimeters or % for percentages
UNECEUnit	String	The unit of measure for this measured quantity, according to the UN/CEFACT Recommendation 20
DurationGranularity	DurationGranularityType	The minimum granularity of duration values. Absence of this annotation means a granularity of seconds with sub-seconds according to the Precision facet.

DurationGranularityType

Type: String

Allowed Value	Description
days	Duration in days, e.g. **`P1D`**
hours	Duration in days and hours, e.g. **`P1DT23H`**
minutes	Duration in days, hours, and minutes, e.g. **`P1DT23H59M`**

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5 Validation Vocabulary

Namespace: Org.OData.Validation.V1

Terms describing validation rules

Terms

Term	Type	Description
Pattern	String	The pattern that a string property, parameter, or term must match. This SHOULD be a valid regular expression, according to the ECMA 262 regular expression dialect.
Minimum	PrimitiveType	Minimum value that a property, parameter, or term can have. Applicable Annotation Terms: • Exclusive
Maximum	PrimitiveType	Maximum value that a property, parameter, or term can have. Applicable Annotation Terms: • Exclusive
Exclusive	Tag	Tags a Minimum or Maximum as exclusive, i.e. an open interval boundary.
AllowedValues	[AllowedValue]	A collection of valid values for the annotated property, parameter, or type definition
MultipleOf	Decimal	The value of the annotated property, parameter, or term must be an integer multiple of this positive value. For temporal types, the value is measured in seconds.
Constraint	ConstraintType	Condition that the annotation target has to fulfill
ItemsOf	[ItemsOfType]	A list of constraints describing that entities related via one navigation property MUST also be related via another, collection-valued navigation property. The same **`path`** value MUST NOT occur more than once. Example: entity type **`Customer`** has navigation properties **`AllOrders`**, **`OpenOrders`**, and **`ClosedOrders`**. The term allows to express that items of **`OpenOrders`** and **`ClosedOrders`** are also items of the **`AllOrders`** navigation property, even though they are defined in an **`Orders`** entity set.
OpenPropertyTypeConstraint	[SingleOrCollectionType]	Dynamic properties added to the annotated open structured type are restricted to the listed types.

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Term	Type	Description
DerivedTypeConstraint	[SingleOrCollectionType]	Values are restricted to types that are both identical to or derived from the declared type and a type listed in this collection. This allows restricting values to certain sub-trees of an inheritance hierarchy, including hierarchies starting at the **[Built-In Abstract Types]**. Types listed in this collection are ignored if they are not derived from the declared type of the annotated model element or would not be allowed as declared type of the annotated model element. When applied to a collection-valued element, this annotation specifies the types allowed for members of the collection without mentioning the **`Collection()`** wrapper. The SingleOrCollectionType may only include the **`Collection()`** wrapper if the annotation is applied to an element with declared type **`Edm.Untyped`**.
AllowedTerms	[QualifiedTermName]	Annotate a term of type Edm.AnnotationPath, or a property of type Edm.AnnotationPath that is used within a structured term, to restrict the terms that can be targeted by the path. The annotation path expression is intended to end in a path segment with one of the listed terms. For forward compatibility, clients should be prepared for the annotation to reference terms besides those listed.
ApplicableTerms	[QualifiedTermName]	Names of specific terms that are applicable and may be applied in the current context. This annotation does not restrict the use of other terms.
MaxItems	Int64	The annotated collection must have at most the specified number of items.
MinItems	Int64	The annotated collection must have at least the specified number of items.

AllowedValue

Property	Type	Description
Value	PrimitiveType?	An allowed value for the property, parameter, or type definition

Applicable Annotation Terms:

- SymbolicName

ConstraintType

Property	Type	Description
FailureMessage	String?	Human-readable message that can be shown to end users if the constraint is not fulfilled

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Property	Type	Description
Condition	Boolean	Value MUST be a dynamic expression that evaluates to true if and only if the constraint is fulfilled

ItemsOfType

Entities related via the single- or collection-valued navigation property identified by **`path`** are also related via the collection-valued navigation property identified by **`target`**.

Property	Type	Description
path	NavigationPropertyPath	A path to a single- or collection-valued navigation property
target	NavigationPropertyPath	A path to a collection-valued navigation property

SingleOrCollectionType

Type: String

The qualified name of a type in scope, optionally wrapped in **`Collection()`** to denote a collection of instances of the type

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6 Aggregation Vocabulary

Namespace: Org.OData.Aggregation.V1

Terms to describe which data in a given entity model can be aggregated, and how.

Related to the specification document OData-Data-Agg-v4.0.

Terms

Term	Type	Description
ApplySupported	ApplySupportedType	This entity set or collection supports the **`$apply`** system query option
ApplySupportedDefaults	ApplySupportedBase	Default support of the **`$apply`** system query option for all collection-valued resources in the container Annotating term **`ApplySupported`** for a specific collection-valued resource overrides the default support with the specified properties using PATCH semantics: • Primitive or collection-valued properties specified in **`ApplySupported`** replace the corresponding properties specified in **`ApplySupportedDefaults`** • Complex-valued properties specified in **`ApplySupported`** override the corresponding properties specified in **`ApplySupportedDefaults`** using PATCH semantics recursively • Properties specified neither in **`ApplySupported`** nor in **`ApplySupportedDefaults`** have their default value
Groupable *(Deprecated)*	Tag	Deprecated in favor of ApplySupported/GroupableProperties
Aggregatable *(Deprecated)*	Tag	Deprecated in favor of ApplySupported/AggregatableProperties
CustomAggregate	String	Dynamic property that can be used in the **`aggregate`** transformation This term MUST be applied with a Qualifier, the Qualifier value is the name of the dynamic property. The value of the annotation MUST be the qualified name of a primitive type. The aggregated value will be of that type.

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Term	Type	Description
ContextDefiningProperties	[PropertyPath]	The annotated property or custom aggregate is only well-defined in the context of these properties The context-defining properties need either be part of the result entities, or be restricted to a single value by a pre-filter operation. Examples are postal codes within a country, or monetary amounts whose context is the unit of currency.
LeveledHierarchy	[PropertyPath]	Defines a leveled hierarchy (OData-Data-Agg-v4.0, section 5.5.1)
RecursiveHierarchy	RecursiveHierarchyType	Defines a recursive hierarchy (OData-Data-Agg-v4.0, section 5.5.2)
UpPath	[String]	The string values of the node identifiers in a path from the annotated node to a start node in a traversal of a recursive hierarchy This instance annotation occurs in the result set after a **`traverse`** transformation (OData-Data-Agg-v4.0, section 6.2.2.2). A use case for this is traversal with multiple parents, when this annotation takes as value one parent node identifier followed by one grandparent node identifier and so on.
AvailableOnAggregates	AvailableOnAggregatesType	This function is available on aggregated entities if the **`RequiredProperties`** are still defined

Functions

isnode

Is the entity a node of the hierarchy specified by the parameter pair (**`HierarchyNodes`**, **`HierarchyQualifier`**)? (See OData-Data-Agg-v4.0, section 5.5.2.1)

If a node identifier passed to the function is null, the function returns null.

Parameter	Type	Description
HierarchyNodes	[EntityType]	A collection, given through a **`$root`** expression
HierarchyQualifier	HierarchyQualifier	
Node	PrimitiveType?	Node identifier of the putative node
→	Boolean?	

isroot

Is the entity a root node of the hierarchy specified by the parameter pair (**`HierarchyNodes`**, **`HierarchyQualifier`**)?

If a node identifier passed to the function is null, the function returns null.

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Parameter	Type	Description
HierarchyNodes	[EntityType]	A collection, given through a **`$root`** expression
HierarchyQualifier	HierarchyQualifier	
Node	PrimitiveType?	Node identifier of the putative root
→	Boolean?	

isdescendant

Is the entity a descendant node of the ancestor node in the hierarchy specified by the parameter pair (**`HierarchyNodes`**, **`HierarchyQualifier`**) with at most the specified distance? (See OData-Data-Agg-v4.0, section 5.5.2.1)

If a node identifier passed to the function is null, the function returns null.

Parameter	Type	Description
HierarchyNodes	[EntityType]	A collection, given through a **`$root`** expression
HierarchyQualifier	HierarchyQualifier	
Node	PrimitiveType?	Node identifier of the putative descendant
Ancestor	PrimitiveType?	Node identifier of the ancestor node
MaxDistance	Int16	*Optional parameter*
IncludeSelf	Boolean	*Optional parameter:* Whether to include the node itself in the result
→	Boolean?	

isancestor

Is the entity an ancestor node of the descendant node in the hierarchy specified by the parameter pair (**`HierarchyNodes`**, **`HierarchyQualifier`**) with at most the specified distance? (See OData-Data-Agg-v4.0, section 5.5.2.1)

If a node identifier passed to the function is null, the function returns null.

Parameter	Type	Description
HierarchyNodes	[EntityType]	A collection, given through a **`$root`** expression
HierarchyQualifier	HierarchyQualifier	
Node	PrimitiveType?	Node identifier of the putative ancestor
Descendant	PrimitiveType?	Node identifier of the descendant node
MaxDistance	Int16	*Optional parameter*
IncludeSelf	Boolean	*Optional parameter:* Whether to include the node itself in the result

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Parameter	Type	Description
→	Boolean?	

issibling

Is the entity a sibling node of the other node in the hierarchy specified by the parameter pair (**`HierarchyNodes`**, **`HierarchyQualifier`**)? (See OData-Data-Agg-v4.0, section 5.5.2.1)

A node is not a sibling of itself. If a node identifier passed to the function is null, the function returns null.

Parameter	Type	Description
HierarchyNodes	[EntityType]	A collection, given through a **`$root`** expression
HierarchyQualifier	HierarchyQualifier	
Node	PrimitiveType?	Node identifier of the putative sibling
Other	PrimitiveType?	Node identifier of the other node
→	Boolean?	

isleaf

Is the entity a leaf node in the hierarchy specified by the parameter pair (**`HierarchyNodes`**, **`HierarchyQualifier`**)? (See OData-Data-Agg-v4.0, section 5.5.2.1)

If a node identifier passed to the function is null, the function returns null.

Parameter	Type	Description
HierarchyNodes	[EntityType]	A collection, given through a **`$root`** expression
HierarchyQualifier	HierarchyQualifier	
Node	PrimitiveType?	Node identifier of the putative leaf
→	Boolean?	

rollupnode

During **`rolluprecursive`** for a hierarchy node, this function returns the node

This function may only occur in the second parameter of a **`groupby`** transformation whose first parameter contains **`rolluprecursive(...)`**. It is evaluated as part of the transformation **`R(x)`** in the "**`rolluprecursive`** algorithm" (OData-Data-Agg-v4.0, section 6.3). Its behavior is undefined outside of this algorithm.

```
Sales?$apply=groupby((rolluprecursive(...)), filter(SalesOrganization eq
Aggregation.rollupnode())/aggregate(...))
```

constructs a rollup that contains aggregates per hierarchy node while excluding descendants from the aggregation.

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Parameter	Type	Description
Position	Int16	*Optional parameter:* Position N among the **`rolluprecursive`** operators in the first argument of **`groupby`** Every instance in the output set of a **`groupby`** transformation with M **`rolluprecursive`** operators has M relationships to M nodes in M recursive hierarchies. This function returns the node x with path r to the root in relationship number N. If several such **`groupby`** transformations are nested, this function refers to the innermost one.
→	EntityType	

ApplySupportedBase

Services that do not fully implement a certain aggregation-related functionality may document this by annotating the **`ApplySupported`** or **`ApplySupportedDefaults`** annotation with a description.

Derived Types:

- ApplySupportedType

Property	Type	Description
Transformations	[Transformation]	Transformations that can be used in **`$apply`**
CustomAggregationMethods	[String]	Qualified names of custom aggregation methods that can be used in **`aggregate(...with...)`**
Rollup	RollupType	The service supports rollup hierarchies in a **`groupby`** transformation
From	Boolean	The service supports the **`from`** keyword in an **`aggregate`** transformation

ApplySupportedType: ApplySupportedBase

Property	Type	Description
Transformations	[Transformation]	Transformations that can be used in **`$apply`**
CustomAggregationMethods	[String]	Qualified names of custom aggregation methods that can be used in **`aggregate(...with...)`**
Rollup	RollupType	The service supports rollup hierarchies in a **`groupby`** transformation
From	Boolean	The service supports the **`from`** keyword in an **`aggregate`** transformation
PropertyRestrictions *(Deprecated)*	Boolean	Deprecated since `Groupable` and `Aggregatable` are deprecated

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Property	Type	Description
GroupableProperties	[AnyPropertyPath]	A non-empty collection indicates that only the listed properties of the annotated target are supported by the **`groupby`** transformation
AggregatableProperties	[AggregatablePropertyType]	A non-empty collection indicates that only the listed properties of the annotated target can be used in the **`aggregate`** transformation, optionally restricted to the specified aggregation methods

AggregatablePropertyType

Property	Type	Description
Property	PropertyPath	Aggregatable property
SupportedAggregationMethods	[AggregationMethod]	Standard and custom aggregation methods that can be applied to the property. If omitted, all aggregation methods can be applied
RecommendedAggregationMethod	AggregationMethod?	Recommended method for aggregating values of the property

Transformation

Type: String

A transformation that can be used in **`$apply`**

Allowed Value	Description
aggregate	OData-Data-Agg-v4.0, section 3.2.1
groupby	OData-Data-Agg-v4.0, section 3.2.3
concat	OData-Data-Agg-v4.0, section 3.2.2
identity	OData-Data-Agg-v4.0, section 3.4.1
filter	OData-Data-Agg-v4.0, section 3.3.2
search	OData-Data-Agg-v4.0, section 3.3.4
nest	OData-Data-Agg-v4.0, section 3.5.2
addnested	OData-Data-Agg-v4.0, section 3.4.3
join	OData-Data-Agg-v4.0, section 3.5.1
outerjoin	OData-Data-Agg-v4.0, section 3.5.1
compute	OData-Data-Agg-v4.0, section 3.4.2
bottomcount	OData-Data-Agg-v4.0, section 3.3.1.1

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Allowed Value	Description
bottomsum	OData-Data-Agg-v4.0, section 3.3.1.3
bottompercent	OData-Data-Agg-v4.0, section 3.3.1.2
topcount	OData-Data-Agg-v4.0, section 3.3.1.1
topsum	OData-Data-Agg-v4.0, section 3.3.1.3
toppercent	OData-Data-Agg-v4.0, section 3.3.1.2
orderby	OData-Data-Agg-v4.0, section 3.3.3
top	OData-Data-Agg-v4.0, section 3.3.6
skip	OData-Data-Agg-v4.0, section 3.3.5
ancestors	OData-Data-Agg-v4.0, section 6.2.1
descendants	OData-Data-Agg-v4.0, section 6.2.1
traverse	OData-Data-Agg-v4.0, section 6.2.2

AggregationMethod

Type: String

Standard or custom aggregation method

Custom aggregation methods MUST use a namespace-qualified name, that is contain at least one dot.

Allowed Value	Description
sum	Can be applied to numeric values to return the sum of the non-null values, or null if there are no non-null values or the input set is empty
min	Can be applied to values with a totally ordered domain to return the smallest of the non-null values, or null if there are no non-null values or the input set is empty
max	Can be applied to values with a totally ordered domain to return the largest of the non-null values, or null if there are no non-null values or the input set is empty
average	Can be applied to numeric values to return the sum of the non-null values divided by the count of the non-null values, or null if there are no non-null values or the input set is empty
countdistinct	Counts the distinct values, omitting any null values For navigation properties, it counts the distinct entities in the union of all entities related to entities in the input set. For collection-valued primitive properties, it counts the distinct items in the union of all collection values in the input set.

RollupType

The number of **`rollup`** or **`rolluprecursive`** operators allowed in a **`groupby`** transformation

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Member	Value	Description
None	0	No support for **`rollup`** or **`rolluprecursive`**
SingleHierarchy	1	Only one **`rollup`** or **`rolluprecursive`** operator per **`groupby`**
MultipleHierarchies	2	Full support for **`rollup`** and **`rolluprecursive`**

RecursiveHierarchyType

Property	Type	Description
NodeProperty	PropertyPath	Primitive property holding the node identifier
ParentNavigationProperty	NavigationPropertyPath	Property for navigating to the parent node(s). Its type MUST be the entity type annotated with this term, and it MUST be collection-valued or nullable single-valued.

HierarchyQualifier

Type: String

Qualifier of a **`RecursiveHierarchy`** annotation

Every recursive hierarchy function defined in this vocabulary has

- a parameter **`HierarchyQualifier`** of this type and
- a parameter **`HierarchyNodes`** that is a collection of entities of a common type without multiple occurrences of the same entity.

`HierarchyQualifier` is the qualifier of a **`RecursiveHierarchy`** annotation on the entity type of the collection given by the **`HierarchyNodes`** parameter. This specifies a recursive hierarchy that is evaluated by the function.

AvailableOnAggregatesType

Property	Type	Description
RequiredProperties	[PropertyPath]	Properties required to apply this function

NavigationPropertyAggregationCapabilities: NavigationPropertyRestriction *(Deprecated)*

`Capabilities.NavigationRestrictions` that make use of the additional properties in this subtype are deprecated in favor of **`ApplySupported`** and **`CustomAggregate`**

CustomAggregateType *(Deprecated)*

Deprecated since **`NavigationPropertyAggregationCapabilities`** is also deprecated

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7 Authorization Vocabulary

Namespace: Org.OData.Authorization.V1

The Authorization Vocabulary provides terms for describing authorization requirements of the service

Terms

Term	Type	Description
SecuritySchemes	[SecurityScheme]	At least one of the specified security schemes are required to make a request against the service
Authorizations	[Authorization]	Lists the methods supported by the service to authorize access

SecurityScheme

Property	Type	Description
Authorization	SchemeName	The name of a required authorization scheme
RequiredScopes	[String]	The names of scopes required from this authorization scheme

Authorization

Base type for all Authorization types

Derived Types:

- OpenIDConnect
- Http
- *OAuthAuthorization*
  - OAuth2ClientCredentials
  - OAuth2Implicit
  - OAuth2Password
  - OAuth2AuthCode
- ApiKey

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme

OpenIDConnect: Authorization

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme

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Property	Type	Description
IssuerUrl	URL	Issuer location for the OpenID Provider. Configuration information can be obtained by appending `/.well-known/openid-configuration` to this Url.

Http: Authorization

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme
Scheme	String	HTTP Authorization scheme to be used in the Authorization header, as per RFC7235
BearerFormat	String?	Format of the bearer token

OAuthAuthorization: Authorization

Derived Types:

- OAuth2ClientCredentials
- OAuth2Implicit
- OAuth2Password
- OAuth2AuthCode

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme
Scopes	[AuthorizationScope]	Available scopes
RefreshUrl	URL?	Refresh Url

OAuth2ClientCredentials: OAuthAuthorization

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme
Scopes	[AuthorizationScope]	Available scopes
RefreshUrl	URL?	Refresh Url
TokenUrl	URL	Token Url

OAuth2Implicit: OAuthAuthorization

Security note: OAuth2 implicit grant is considered to be not secure and should not be used by clients, see OAuth 2.0 Security Best Current Practice.

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Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme
Scopes	[AuthorizationScope]	Available scopes
RefreshUrl	URL?	Refresh Url
AuthorizationUrl	URL	Authorization URL

OAuth2Password: OAuthAuthorization

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme
Scopes	[AuthorizationScope]	Available scopes
RefreshUrl	URL?	Refresh Url
TokenUrl	URL	Token Url

OAuth2AuthCode: OAuthAuthorization

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme
Scopes	[AuthorizationScope]	Available scopes
RefreshUrl	URL?	Refresh Url
AuthorizationUrl	URL	Authorization URL
TokenUrl	URL	Token Url

AuthorizationScope

Property	Type	Description
Scope	String	Scope name
Grant	String?	Identity that has access to the scope or can grant access to the scope.
Description	String	Description of the scope

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ApiKey: Authorization

Property	Type	Description
Name	String	Name that can be used to reference the authorization scheme
Description	String?	Description of the authorization scheme
KeyName	String	The name of the header or query parameter
Location	KeyLocation	Whether the API Key is passed in the header or as a query option

KeyLocation

Member	Value	Description
Header	0	API Key is passed in the header
QueryOption	1	API Key is passed as a query option
Cookie	2	API Key is passed as a cookie

SchemeName

Type: String

The name of the authorization scheme.

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8 JSON Vocabulary

Namespace: Org.OData.JSON.V1

Terms, types, and functions for JSON data

OData **[stream properties]** allow embedding data of arbitrary media types, and the OData JSON format allows **[direct embedding of JSON data]** in request and response payloads.

This vocabulary defines a convenience type for JSON data as well as a term for referencing a JSON Schema describing the structure of the JSON data.

In addition it defines two functions for querying JSON data and using a primitive value extracted from JSON data in common expressions, for example in **`$filter`**, **`$orderby`**, or **`$compute`**.

Example

The **`Employees`** entity set has a JSON data property **`resume`** (see CSDL JSON or CSDL XML).

One of its entities has a **`resume`** value of

```
{
  "ssn": "1234",
  "lastname": "Doe",
  "address": {
    "zipcode": "10022",
    "street": "ABC st"
  },
  "experience": "excellent"
}
```

This allows to filter and sort by values in that resume, and extract parts of the resume as a dynamic JSON data property

```
GET http://www.example.com/mycompany/Employees
      ?$filter=resume/JSON.value(path='$.lastname') eq 'Doe'
      &$orderby=resume/JSON.valueNumber(path='$.experience')
      &$compute=resume/JSON.query(path='$.address') as address
      &$expand=address
```

receiving

```
{
  "@odata.context": "$metadata#Employees",
  "value": [
    {
      "empid": 4711,
      "address": {
        "zipcode": "10022",
        "street": "ABC st"
      }
    },
    ...
```


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```
  ]
}
```

Terms

Term	Type	Description
Schema	JSON	The JSON Schema for JSON values of the annotated media entity type, property, parameter, return type, term, or type definition The schema can be a reference, i.e. **`{"$ref":"url/of/schemafile#/path/to/schema/within/schemafile"}`**

Functions

query

Query a stream value of media type **`application/json`**, returning a stream value of media type **`application/json`**

Extracts a JSON value, such as an array, object, or a JSON scalar value (string, number, boolean, or **`null`**) from the **`input`** JSON value:

- If **`path`** only consists of the root identifier followed by name and index selectors, it returns the identified single node within **`input`**, or **`null`** if no node is identified.
- If **`path`** potentially identifies multiple nodes within **`input`** (by using descendant, wildcard, union, array subset, or filter selectors), it returns an array containing the identified nodes, or an empty array if no node is identified.
- If **`input`** is not a valid JSON value, the function returns **`null`**.
- If **`path`** is **`null`**, not a valid JSONPath expression, or does not match the structure of **`input`** (for example applying an index selector to a scalar value), the function returns **`null`**.

Parameter	Type	Description
input	JSON?	**Binding parameter:** JSON input
path	Path?	JSONPath expression to be applied to value of **`expr`**
→	JSON?	JSON value resulting from applying **`path`** to **`input`**

value

Query a stream value of media type **`application/json`**, returning a string

Extracts a single OData primitive value from the **`input`** JSON value and casts it to a string:

- If **`path`** only consists of the root identifier followed by name and index selectors and identifies a single scalar JSON value (string, number, boolean, or **`null`**) within **`input`**, it returns the identified single value, cast to a string.
- If **`path`** identifies multiple nodes within **`input`** (by using descendant, wildcard, union, array subset, or filter selectors), identifies an object or array, or does not identify any node, the function returns **`null`**.
- If **`input`** is not a valid JSON value, the function returns **`null`**.
- If **`path`** is **`null`**, not a valid JSONPath expression, or does not match the structure of **`input`** (for example applying an index selector to a scalar value), the function returns **`null`**.

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Parameter	Type	Description
input	JSON?	**Binding parameter:** JSON input
path	Path?	JSONPath expression to be applied to value of **expr**
→	String?	String value resulting from applying **path** to **input**

valueNumber

Query a stream value of media type **application/json**, returning a number

Like **value**, but casts the extracted value to an **Edm.Decimal** with unspecified precision and floating scale. Returns null if that cast fails.

Parameter	Type	Description
input	JSON?	**Binding parameter:** JSON input
path	Path?	JSONPath expression to be applied to value of **expr**
→	Decimal?	Numeric value resulting from applying **path** to **input**

valueBoolean

Query a stream value of media type **application/json**, returning a Boolean

Like **value**, but casts the extracted value to an **Edm.Boolean**. Returns null if that cast fails.

Parameter	Type	Description
input	JSON?	**Binding parameter:** JSON input
path	Path?	JSONPath expression to be applied to value of **expr**
→	Boolean?	Boolean value resulting from applying **path** to **input**

JSON

Type: Stream

Textual data of media type **application/json**

Path

Type: String

JSONPath expression

Implementations MUST support at least the following subset of JSONPath:

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Syntax Element	Description	Examples
`$`	root identifier	`$`
`[<selector>]`	child segment selects one child of a node; contains one name selector (single- or double-quoted string using JSON escaping rules) or index selector (non-negative decimal integer)	`$['foo']`, `$.foo["bar"]`, `$.bar[0]`, `$.bar[42]`
`.name`	shorthand for `['name']`	`$.foo`, `$.foo.bar`, `$.bar[42].baz`

Implementations MAY in addition support other JSONPath constructs, for example:

Syntax Element	Description	Examples
`[<selector>]`	index selector with negative integer array index (counts from the end of the array)	`$.bar[-1]`
`[<selectors>]`	non-empty, comma-separated sequence of selectors	`$.foo['bar','baz']`, `$.bar[0,1,2,3,5,7,11]`
`..[<selectors>]`	descendant segment: selects zero or more descendants of a node	`$.foo..["bar"]`
`..name`	shorthand for `..['name']`	`$.foo..bar`
`*`	wildcard selector: selects all children of a node	`$.foo[*]`, `$[*]`
`.*`	shorthand for `[*]`	`$.foo.*`, `$.*`
`..*`	shorthand for `..[*]`	`$.foo..*`, `$..*`
`[start:end]`	array subset by range of indices (including the item at *start* and excluding the item at *end*	`$.bar[2:5]`, same as `$.bar[2,3,4]`
`[start:]`	array subset from *start* to end of array	`$.bar[2:]`
`[:n]`	the first *n* array items	`$.bar[:4]`
`[-n:]`	the last *n* array items	`$.bar[-3:]`
`[start:end:step]`	array slice selector	
`[?<logical-expr>]`	filter selector: selects particular children using a logical expression	
`@`	current node identifier (valid only within filter selectors)	`$.bar[?@.baz==42]`

References for JSONPath

- RFC 9535: https://datatracker.ietf.org/doc/html/rfc9535
- Historic site: https://goessner.net/articles/JsonPath/

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- Node.js implementation: https://www.npmjs.com/package/jsonpath
- Java implementation: https://github.com/json-path/JsonPath
- Online evaluator: https://jsonpath.com/

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9 Repeatability Vocabulary

Namespace: Org.OData.Repeatability.V1

Terms describing repeatable requests

Terms

Term	Type	Description
Supported	Tag	Repeatable requests are supported for the annotated service, entity set, or action Annotations on entity set or action import level override an annotation on entity container level, and an annotation on action level override an annotation on action import level.
DeleteWithClientIDSupported	Tag	Deletion of remembered requests by client ID is supported Clients that specify a **`RepeatabilityClientID`** header can delete all remembered requests for that client ID by sending a **`DELETE $RepeatableRequestsWithClientID/{Repeatability-Client-ID}`** request to the service root.
DeleteWithRequestIDSupported	Tag	Deletion of remembered requests by request ID is supported Clients can delete a single remembered request by sending a **`DELETE $RepeatableRequestWithRequestID/{Repeatability-Request-ID}`** request to the service root.

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10 Temporal Vocabulary

Namespace: Org.OData.Temporal.V1

Terms for describing time-dependent data

Terms

Term	Type	Description
ApplicationTimeSupport	ApplicationTimeSupportType	This collection supports temporal requests

Actions

Update

Updates existing time slices with values from delta time slices whose object keys match and whose periods overlap

The update behavior for a given object key is known from the SQL statement **`UPDATE ... FOR PORTION OF BUSINESS_TIME ... WHERE ...`**.

`deltaTimeslices` with non-matching object keys and non-overlapping sub-periods of **`deltaTimeslices`** are disregarded.

Parameter	Type	Description
timeslices	[EntityType]	**Binding parameter:** Time slices to modify
deltaTimeslices	[TimesliceWithPeriod]	New time slices whose property values are used to update the **`timeslices`** collection The delta time slices need not contain all properties, but at least the boundary values of the period to change. An absent object key property matches any key property value. New time slices are processed in the order of the collection, which especially matters if some of the specified change periods overlap.
→	[TimesliceWithPeriod]	Modified time slices

Upsert

Like **`Update`**, but additionally inserts those (sub-periods of) **`deltaTimeslices`** that **`Update`** disregards

Parameter	Type	Description
timeslices	[EntityType]	**Binding parameter:** Time slices to modify
deltaTimeslices	[TimesliceWithPeriod]	New time slices to be merged into the **`timeslices`** collection The delta time slices must contain all properties that are needed for insertion. New time slices are processed in the order of the collection, which especially matters if some of the specified change periods overlap.
→	[TimesliceWithPeriod]	Modified time slices

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Delete

Deletes (sub-periods of) existing time slices whose object keys match and whose periods overlap **`deltaTimeslices`**

The deletion behavior for a given object key is known from the SQL statement **`DELETE ... FOR PORTION OF BUSINESS_TIME ... WHERE ...`**. The sub-period of an existing time slice that lies outside a given instance of **`deltaTimeslices`** is kept, effectively shortening the time slice.

Parameter	Type	Description
timeslices	[EntityType]	**Binding parameter:** Time slices to modify
deltaTimeslices	[TimesliceWithPeriod]	Time slices to be deleted from the **`timeslices`** collection The delta time slices contain only the boundary values of the period to delete and (parts of) the object key. An absent object key property matches any key property value.
→	[TimesliceWithPeriod]	Deleted (sub-periods of) time slices

ApplicationTimeSupportType

Property	Type	Description
UnitOfTime	UnitOfTime	Unit of time and other properties of a time period
Timeline	Timeline	Describes how the history and future of the data are represented
SupportedActions	[QualifiedActionName]	List of supported temporal actions

UnitOfTime

Unit of time and other properties of a time period

Derived Types:

- UnitOfTimeDateTimeOffset
- UnitOfTimeDate

UnitOfTimeDateTimeOffset: UnitOfTime

Period start and end are of type Edm.DateTimeOffset

Property	Type	Description
Precision	Byte	Precision of Edm.DateTimeOffset values for period start and end

UnitOfTimeDate: UnitOfTime

Period start and end are of type Edm.Date

The period is a contiguous set of days and does not consider the time of the day.

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Property	Type	Description
ClosedClosedPeriods	Boolean	If **`true`**, the period end is the last day in the period; if **`false`**, the period end is the first day after the period

Timeline

Describes how the history and future of the data are represented

Derived Types:

- TimelineSnapshot
- TimelineVisible

TimelineSnapshot: Timeline

Each OData entity maps each point in application time to an instance of the entity type

To address an entity in a resource path or path to related resources, a point in application time must be specified as described in [OData-Temporal, section 4.2.1]. The addressed entity is then a snapshot of the data at the given point in time. When an action defined in this vocabulary is applied to a collection of this entity type, the entity key plays the role of object key.

TimelineVisible: Timeline

Each OData entity represents data during a period of application time

The temporal collection MUST NOT contain two entities with the same object key as defined by their **`ObjectKey`** properties and with overlapping application-time periods as defined by their **`PeriodStart`** and **`PeriodEnd`** properties. The temporal collection always contains all entities (with consecutive time periods) for a given object key.

Property	Type	Description
PeriodStart	PropertyPath	Property containing lower boundary of a period
PeriodEnd	PropertyPath	Property containing upper boundary of a period If an upper boundary property does not specify a default value, a default value of **`max`** is assumed.
ObjectKey	[PropertyPath]	The set of primitive properties that identify a temporal object A temporal object is a set of facts whose changes over application time are tracked by the service. The entities in the annotated collection belong to potentially multiple temporal objects, and each temporal object is uniquely identified by the values of the specified object key properties. Object key properties follow the same rules as entity key properties. If no object key is specified, only a single temporal object belongs to the annotated collection.

TimesliceWithPeriod

Delta time slices with validity period

The properties **`PeriodStart`** and **`PeriodEnd`** MUST NOT be present if the entity type of the **`Timeslice`** already contains period start and end, that is, if the collection on which the action is invoked has visible timeline. If present, they MUST have the same type, either **`Edm.Date`** or **`Edm.DateTimeOffset`**, and they are interpreted according to the **`ApplicationTimeSupport/UnitOfTime`** of the collection. In particular,

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`ApplicationTimeSupport/UnitOfTime/ClosedClosedPeriods` governs whether a **`PeriodEnd`** of type **`Edm.Date`** is the last day in the period or the first day after the period. If **`PeriodStart`** is present and **`PeriodEnd`** is absent, a default value of **`max`** is assumed for **`PeriodEnd`**.

Property	Type	Description
PeriodStart	PrimitiveType?	Lower boundary of the time slice
PeriodEnd	PrimitiveType?	Upper boundary of the time slice
Timeslice	EntityType	A time slice with the same entity type as the binding parameter of the action When it appears in the return type of an action in this vocabulary, the time slice has the same entity set as the binding parameter value.

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Appendix A. References

This appendix contains the normative and informative references that are used in this document.

While any hyperlinks included in this appendix were valid at the time of publication, OASIS cannot guarantee their long-term validity.

A.1 Normative References

The following documents are referenced in such a way that some or all of their content constitutes requirements of this document.

[OData-Protocol]

OData Version 4.02. Part 1: Protocol.
See link in “Related work” section on cover page.

[OData-CSDL]

OData Common Schema Definition Language (CSDL) JSON Representation Version 4.02.
See link in “Related work” section on cover page.

OData Common Schema Definition Language (CSDL) XML Representation Version 4.02.
See link in “Related work” section on cover page.

[RFC2119]

Bradner, S., “Key words for use in RFCs to Indicate Requirement Levels”, BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997. https://www.rfc-editor.org/info/rfc2119.

[RFC8174]

Leiba, B., “Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words”, BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017. https://www.rfc-editor.org/info/rfc8174.

A.2 Non-Normative References

[OData-Vocabs]

odata-vocabularies OASIS TC GitHub repository. https://github.com/oasis-tcs/odata-vocabularies.

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Appendix B. Acknowledgments

B.1 Special Thanks

The contributions of the OASIS OData Technical Committee members, enumerated in **[OData-Protocol, section C.2]**, are gratefully acknowledged.

B.2 Participants

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Appendix C. Revision History

Revision	Date	Editor	Changes Made
Committee Specification Draft 01	2016-12-08	Michael Pizzo Ralf Handl Ram Jeyaraman	Documentation automatically extracted from XML source files
Committee Specification Draft 02	2024-06-19	Michael Pizzo Ralf Handl Heiko Theißen	Documentation automatically extracted from XML source files
Committee Specification Draft 03	2026-08-19	Michael Pizzo Ralf Handl Heiko Theißen	Documentation automatically extracted from XML source files

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Appendix D. Notices

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