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Shanthi Bhaskar

December 6, 2019 | 4 minute read

All about CDS Annotations

💬 12   👍 23   👁 22,546

This blog would give insights about the Annotations used in the S4HANA CDS DDL views.

If you are begineer then you will be puzzeled what are the available Annotations which we can use while creating a CDS view. SAP doesn't allow any customer specific annotations so you have to use what ever SAP delivered.

Below is the whole list available in English and sorted by Annotation group. Intentionally added in code format so that it would easy to copy ?

```
AbapCatalog.buffering.numberOfKeyFields
AbapCatalog.buffering.status
AbapCatalog.buffering.type
AbapCatalog.compiler.compareFilter
AbapCatalog.dbHints[ ].dbSystem
AbapCatalog.dbHints[ ].hint
AbapCatalog.preserveKey
AbapCatalog.sqlViewAppendName
AbapCatalog.sqlViewName
AbapCatalog.viewEnhancementCategory[ ]
AccessControl.authorizationCheck
ClientDependent
ClientHandling.algorithm
ClientHandling.type
```

```
Consumption.defaultValue
Consumption.derivation.binding[ ].targetElement
Consumption.derivation.binding[ ].targetParameter
Consumption.derivation.binding[ ].type
Consumption.derivation.binding[ ].value
Consumption.derivation.derivationFilter
Consumption.derivation.lookupEntity
Consumption.derivation.procedure
Consumption.derivation.resultElement
Consumption.filter.defaultValue
Consumption.filter.hidden
Consumption.filter.hierarchyBinding[ ].type
Consumption.filter.hierarchyBinding[ ].value
Consumption.filter.hierarchyBinding[ ].variableSequence
Consumption.filter.mandatory
Consumption.filter.multipleSelections
Consumption.filter.selectionType
Consumption.groupWithElement
Consumption.hidden
Consumption.labelElement
Consumption.quickInfoElement
Consumption.semanticObject
Consumption.valueHelp
DataAging.noAgingRestriction
EndUserText.label
EndUserText.quickInfo
Environment.sql.passValue
Environment.systemField
MappingRole
Metadata.allowExtensions
Metadata.ignorePropagatedAnnotations
Metadata.layer
OData.publish
ObjectModel.association.type[ ]
ObjectModel.compositionRoot
ObjectModel.createEnabled
ObjectModel.dataCategory
ObjectModel.deleteEnabled
ObjectModel.foreignKey.association
ObjectModel.mandatory
ObjectModel.modelCategory
ObjectModel.readOnly
ObjectModel.representativeKey
ObjectModel.semanticKey[ ]
ObjectModel.text.association
ObjectModel.text.element[ ]
```

```
ObjectModel.updateEnabled
ObjectModel.writeActivePersistence
ObjectModel.writeDraftPersistence
ObjectModel.writeEnabled
Semantics.address.city
Semantics.address.country
Semantics.address.label
Semantics.address.postBox
Semantics.address.region
Semantics.address.street
Semantics.address.subRegion
Semantics.address.type[ ]
Semantics.address.zipCode
Semantics.amount.currencyCode
Semantics.businessDate.at
Semantics.businessDate.createdAt
Semantics.businessDate.from
Semantics.businessDate.lastChangedAt
Semantics.businessDate.to
Semantics.calendar.dayOfMonth
Semantics.calendar.dayOfYear
Semantics.calendar.month
Semantics.calendar.quarter
Semantics.calendar.week
Semantics.calendar.year
Semantics.calendar.yearMonth
Semantics.calendar.yearQuarter
Semantics.calendar.yearWeek
Semantics.calendarItem.categories
Semantics.calendarItem.class
Semantics.calendarItem.completed
Semantics.calendarItem.contact
Semantics.calendarItem.description
Semantics.calendarItem.dtEnd
Semantics.calendarItem.dtStart
Semantics.calendarItem.due
Semantics.calendarItem.duration
Semantics.calendarItem.fbType
Semantics.calendarItem.location
Semantics.calendarItem.percentComplete
Semantics.calendarItem.priority
Semantics.calendarItem.status
Semantics.calendarItem.summary
Semantics.calendarItem.transparent
Semantics.calendarItem.wholeDay
Semantics.contact.birthDate
```

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```
Semantics.contact.note
Semantics.contact.photo
Semantics.contact.type
Semantics.currencyCode
Semantics.eMail.address
Semantics.eMail.bcc
Semantics.eMail.body
Semantics.eMail.cc
Semantics.eMail.from
Semantics.eMail.keywords
Semantics.eMail.received
Semantics.eMail.sender
Semantics.eMail.subject
Semantics.eMail.to
Semantics.eMail.type[ ]
Semantics.fiscal.period
Semantics.fiscal.year
Semantics.fiscal.yearPeriod
Semantics.fiscal.yearVariant
Semantics.geoLocation.cartoId
Semantics.geoLocation.latitude
Semantics.geoLocation.longitude
Semantics.geoLocation.normalizedName
Semantics.language
Semantics.mimeType
Semantics.name.additionalName
Semantics.name.familyName
Semantics.name.fullName
Semantics.name.givenName
Semantics.name.jobTitle
Semantics.name.nickName
Semantics.name.prefix
Semantics.name.suffix
Semantics.organization.name
Semantics.organization.role
Semantics.organization.unit
Semantics.quantity.unitOfMeasure
Semantics.systemDate.createdAt
Semantics.systemDate.lastChangedAt
Semantics.telephone.type[ ]
Semantics.text
Semantics.time
Semantics.unitOfMeasure
Semantics.url.mimeType
Semantics.user.createdBy
Semantics.user.id
```

```
Semantics.user.lastChangedBy
Semantics.user.responsible
```

Next question is how we to get this list. It's pretty simple, every information in SAP stored in SAP tables itself ? in this case ABDOC_CDS_ANNOS

```
SELECT * FROM ABDOC_CDS_ANNOS where SPRAS = 'E'
```

You can check SAP help on these Annotations using the below link

https://help.sap.com/doc/saphelp_nw751abap/7.51.0/en-US/63/0ce9b386b84e80bfade96779fbaeec/content.htm?no_cache=true

Framework-Specific Annotations

CDS annotations that (as a rule) are evaluated during runtime by specific frameworks such as **SADL**, **BOPF**, **Analytics**, or **Enterprise Search**:

- Analytics Annotations
- AnalyticsDetails Annotations
- Consumption Annotations
- DefaultAggregation Annotations
- EnterpriseSearch Annotations
- Hierarchy Annotations
- ObjectModel Annotations
- OData Annotations
- Search Annotations
- Semantics Annotations
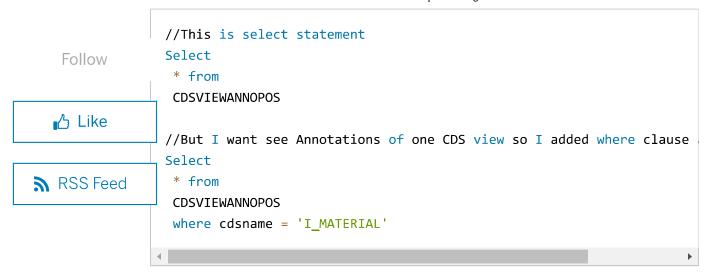- UI Annotations
- VDM Annotations

➡ Tip

To access help for an framework-specific annotation, position the cursor on relevant annotation in the DDL source editor and choose F1 .

For more information, look here Framework-Specific Annotations

Now I want to explain how to get the list of Annotations used in a given CDS view. Recently I saw few questions in SDN about how to CDS views where Odata extraction is enabled, What are all Query CDS views which are available etc...You can play with SQL for answering questions about CDS meta data.

There were two SAP delivered CDS views one for header information and one for the field information.

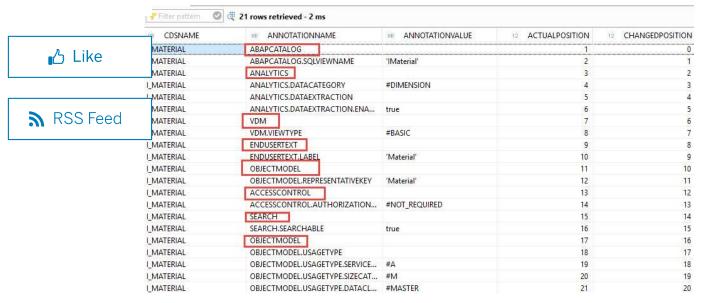## Header level Annotations of a CDS view

```
//This is select statement
Select
 * from
  CDSVIEWANNOPOS

//But I want see Annotations of one CDS view so I added where clause
Select
 * from
  CDSVIEWANNOPOS
  where cdsname = 'I_MATERIAL'
```

This is how I_MATERIAL CDS was defined.

This is the output of the select statement if we exexute the 2nd SQL shown above
code sample

	CDSNAME		ANNOTATIONNAME		ANNOTATIONVALUE		ACTUALPOSITION		CHANGEDPOSITION
	MATERIAL	AB	ABAPCATALOG	AB		12	1	12	0
	MATERIAL		ABAPCATALOG.SQLVIEWNAME		'IMaterial'		2		1
	MATERIAL		ANALYTICS				3		2
	I_MATERIAL		ANALYTICS.DATACATEGORY		#DIMENSION		4		3
	I_MATERIAL		ANALYTICS.DATAEXTRACTION				5		4
	MATERIAL		ANALYTICS.DATAEXTRACTION.ENA...		true		6		5
	MATERIAL		VDM				7		6
	MATERIAL		VDM.VIEWTYPE		#BASIC		8		7
	I_MATERIAL		ENDUSERTEXT				9		8
	I_MATERIAL		ENDUSERTEXT.LABEL		'Material'		10		9
	I_MATERIAL		OBJECTMODEL				11		10
	I_MATERIAL		OBJECTMODEL.REPRESENTATIVEKEY		'Material'		12		11
	I_MATERIAL		ACCESSCONTROL				13		12
	I_MATERIAL		ACCESSCONTROL.AUTHORIZATION...		#NOT_REQUIRED		14		13
	I_MATERIAL		SEARCH				15		14
	I_MATERIAL		SEARCH.SEARCHABLE		true		16		15
	I_MATERIAL		OBJECTMODEL				17		16
	I_MATERIAL		OBJECTMODEL.USAGETYPE				18		17
	I_MATERIAL		OBJECTMODEL.USAGETYPE.SERVICE...		#A		19		18
	I_MATERIAL		OBJECTMODEL.USAGETYPE.SIZECAT...		#M		20		19
	I_MATERIAL		OBJECTMODEL.USAGETYPE.DATACL...		#MASTER		21		20

Filter pattern ✓ 🔲 21 rows retrieved - 2 ms

We can notice highlighted Annotations which doesn't exist in the CDS , these are the
Annotation groups related to the Annotations defined in the CDS.

So I had modified the SQL statement so that output shows only Annotations
available in CDS

```
Select
 * from
 CDSVIEWANNOPOS
 where cdsname = 'I_MATERIAL'
 AND ANNOTATIONNAME LIKE '%.%'
```

CDSNAME	ANNOTATIONNAME	ANNOTATIONVALUE	ACTUALPOSITION	CHANGEDPOSITION
I_MATERIAL	ABAPCATALOG.SQLVIEWNAME	'IMaterial'	2	1
I_MATERIAL	ANALYTICS.DATACATEGORY	#DIMENSION	4	3
I_MATERIAL	ANALYTICS.DATAEXTRACTION		5	4
I_MATERIAL	ANALYTICS.DATAEXTRACTION.ENABLED	true	6	5
I_MATERIAL	VDM.VIEWTYPE	#BASIC	8	7
I_MATERIAL	ENDUSERTEXT.LABEL	'Material'	10	9
I_MATERIAL	OBJECTMODEL.REPRESENTATIVEKEY	'Material'	12	11
I_MATERIAL	ACCESSCONTROL.AUTHORIZATIONCHECK	#NOT_REQUIRED	14	13
I_MATERIAL	SEARCH.SEARCHABLE	true	16	15
I_MATERIAL	OBJECTMODEL.USAGETYPE		18	17
I_MATERIAL	OBJECTMODEL.USAGETYPE.SERVICEQUALITY	#A	19	18
I_MATERIAL	OBJECTMODEL.USAGETYPE.SIZECATEGORY	#M	20	19
I_MATERIAL	OBJECTMODEL.USAGETYPE.DATACLASS	#MASTER	21	20

Filter pattern ✓ 🔲 13 rows retrieved - 5 ms

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Field level Annotation of a CDS view

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```
select * from
CDS_FIELD_ANNOTATION
WHERE CDSNAME = 'I_MATERIAL'
and  ANNOTATIONNAME LIKE '%.%'
```

Filter pattern ✓ 16 rows retrieved - 6 ms

CDSNAME	FIELDNAME	ANNOTATIONNAME	ANNOTATIONVALUE	ACTUALPOSITION	NEXTANNOTATIONNAME
I_MATERIAL	MANDT	ABAPCATALOG.INTERNAL		2	ABAPCATALOG.INTERNAL.ISMANDT
I_MATERIAL	MANDT	ABAPCATALOG.INTERNAL.ISMANDT		3	
I_MATERIAL	MATERIALBASEUNIT	OBJECTMODEL.FOREIGNKEY		14	OBJECTMODEL.FOREIGNKEY.ASSOCIATION
I_MATERIAL	MATERIALWEIGHTUNIT	OBJECTMODEL.FOREIGNKEY		29	OBJECTMODEL.FOREIGNKEY.ASSOCIATION
I_MATERIAL	MATERIAL	OBJECTMODEL.TEXT		9	OBJECTMODEL.TEXT.ASSOCIATION
I_MATERIAL	MATERIALNETWEIGHT	SEMANTICS.QUANTITY		22	SEMANTICS.QUANTITY.UNITOFMEASURE
I_MATERIAL	MATERIALGROSSWEIGHT	SEMANTICS.QUANTITY		17	SEMANTICS.QUANTITY.UNITOFMEASURE
I_MATERIAL	MATERIALBASEUNIT	OBJECTMODEL.FOREIGNKEY.ASSOCIATION	'_BaseUnit'	15	
I_MATERIAL	MATERIALWEIGHTUNIT	OBJECTMODEL.FOREIGNKEY.ASSOCIATION	'_WeightUnit'	30	
I_MATERIAL	MATERIALGROSSWEIGHT	SEMANTICS.QUANTITY.UNITOFMEASURE	'MaterialWeightUnit'	18	DEFAULTAGGREGATION
I_MATERIAL	MATERIALNETWEIGHT	SEMANTICS.QUANTITY.UNITOFMEASURE	'MaterialWeightUnit'	23	DEFAULTAGGREGATION
I_MATERIAL	MATERIAL	OBJECTMODEL.TEXT.ASSOCIATION	'_Text'	10	
I_MATERIAL	MATERIAL	SEARCH.DEFAULTSEARCHELEMENT	true	5	SEARCH
I_MATERIAL	MATERIAL	SEARCH.FUZZINESSTHRESHOLD	0.8	7	OBJECTMODEL
I_MATERIAL	MATERIALBASEUNIT	SEMANTICS.UNITOFMEASURE	true	12	OBJECTMODEL
I_MATERIAL	MATERIALWEIGHTUNIT	SEMANTICS.UNITOFMEASURE	true	27	OBJECTMODEL

Hope this blog will give kick start on the annotations.

Please leave your comments and suggestions so that I can add if anything missing or wrong.

Thanks,

Shanthi

Alert Moderator

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12 Comments

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Ahmed khan

March 28, 2020 at 1:39 pm

What an awesome blog....bro just one thing is missing, which annotation i have to use on which scenario. if you can guide me for it would be really helpful.

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Shanthi Bhaskar | Blog Post Author

April 3, 2020 at 6:58 pm

Please use below in for the documentation

https://help.sap.com/doc/abapdocu_750_index_htm/7.50/en-US/abencds_annotations_sap.htm

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Andre Fischer

April 30, 2020 at 5:53 pm

Very informative!

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Sunny G

July 18, 2020 at 6:28 am

Hello Andre - The author (Shanti Bhaskar) has copied the content from the below link and posted it here as his blog post. This author is a plagiarism king and all he does is to copy the contents from other sites and post it here as his own post. The entire post has been copied and pasted here blindly. Following is the link from which he has copied:

http://sapabapcentral.blogspot.com/2019/12/all-about-cds-annotations.html

Kindly review the same and request you to take the strictest of action against such people who are destroying this wonderful forum.

PS: The other blog posts of this user are also copied content from the web. One such example is the CDS view finder which he copied from SAPYARD (https://blogs.sap.com/2020/05/31/abap-cds-view-finder/). After I posted my comment on plagiarism, looks like this blog has now been deleted.

Thanks

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Jerry Janda
July 18, 2020 at 1:21 pm

That other community post is currently off the site, as we are currently working with Shanthi on how to resolve.

In this case, Shanthi's post was published on December 6. The other was published on December 7 (http://sapabapcentral.blogspot.com/2019/12/all-about-cds-annotations.html). Considering that the time stamps are also dependent on time zones, we'd have to investigate further to see whether, in fact, this post actually came first (in which case someone else plagiarized this, and not the other way around).

One thing missing from the other is that Shanthi includes references to SAP Help and has also been knowledgeable enough to point people to that content in comments:

You can check SAP help on these Annotations using the below link

https://help.sap.com/doc/saphelp_nw751abap/7.51.0/en-US/63/0ce9b386b84e80bfade96779fbaeec/content.htm?no_cache=true

--Jerry

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Shanthi Bhaskar | Blog Post Author
February 23, 2021 at 1:35 am

Hi Jerry,

Thanks for your support.

Sorry for commenting so late here, Was very busy with Group reporting implementation.

Previously I had wrote a blog ABAP CDS View(s) Finder where I had referenced their blog and clearly I had mentioned source. But it was deleted as requested by SDN Moderator. **Now they are doing revenge drama on me** 🙂 .

Not sure what are they doing these kind of actions. After seeing a year like 2020 still people try to defame people unnecessary with Negative thoughts :(.

I am vivid learner and passionate SAP guy and always try to share the things. I had learnt so much and been learning here (SAP SCN), So will be keep posting the stuff as I learn.
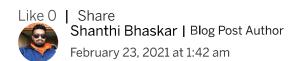
Please refer the below screen cam where email time and date can be seen. I always keep track of my learnings in emails.

Thanks,

Shanthi.

Like 0 | Share

Shanthi Bhaskar | Blog Post Author
February 23, 2021 at 1:42 am

Please check this thread - The original reason why I had published this blog.

https://answers.sap.com/questions/12729039/how-to-identify-cds-views-which-are-enabled-for-da.html?childToView=12841087#answer-12841087

Like 0 | Share

Sunny G

July 18, 2020 at 6:30 am

Shame on you Shanti Bhaskar for copying the content from other sites and posting it here as your own post.

Like 1 | Share

Shanthi Bhaskar | Blog Post Author

February 23, 2021 at 1:44 am

🙂

Like 0 | Share

Shilpa R

May 19, 2021 at 4:09 am

Hi Shanthi Bhaskar, this blog is really helpful, But I had one doubt can we implement variant using CDS annotations?

Like 0 | Share

Shanthi Bhaskar | Blog Post Author

May 26, 2021 at 1:05 pm

I am not sure we have that option Shilpa.

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Shilpa R

May 27, 2021 at 4:49 pm

Ok thank you for your reply

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