

SAP Note

**2997917 - Incorrect SELECT Result from Calculation View When Calculated Column with String Function Is Compared with Non-String Constant Value****Version** 10 **Validity:**
02.09.2022 - active**Language** English

Header Data

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Release Status	Released for Customer	
Component	HAN-DB SAP HANA Database	Display ACRF Content
Priority	Correction with high priority	
Responsible	Jinsol Kim (I533393)	
Processor	Adam Tabis (D067421)	
Category	Program error	
Relevant for Translation	No	

Symptom

A calculation view returns an unexpected result when a non-string constant is compared to a column expressed as a string function

For example:

1. Create a column table TEST_TABLE

```
CREATE COLUMN TABLE "TEST_SCHEMA"."TEST_TABLE" (ID INTEGER, FiscalPeriod NVARCHAR(2));
```

```
INSERT INTO "TEST_SCHEMA"."TEST_TABLE" VALUES (1, 01);  
INSERT INTO "TEST_SCHEMA"."TEST_TABLE" VALUES (2, 02);  
INSERT INTO "TEST_SCHEMA"."TEST_TABLE" VALUES (3, 02);  
INSERT INTO "TEST_SCHEMA"."TEST_TABLE" VALUES (4, 05);  
INSERT INTO "TEST_SCHEMA"."TEST_TABLE" VALUES (5, 10);  
INSERT INTO "TEST_SCHEMA"."TEST_TABLE" VALUES (6, 10);
```

2. Create a calculation view TEST_CALCVIEW that projects ID and FiscalPeriod of TEST_TABLE with one additional output column. Let's name this column **FiscalPeriod_1**

Projected columns from TEST_TABLE:

- ID
- FiscalPeriod

Calculated column:

- FiscalPeriod_1
 - Data type: VARCHAR
 - Length: 2
 - Expression: ltrim("FiscalPeriod", '0')

(ltrim removes prefix whitespaces or specified characters. For example, ltrim('ABCDE', 'AB') returns 'CDE')

3. Save and activate the calculation view

4. Run below two SELECT statements and compare the result sets

a) SELECT * FROM "_SYS_BIC"."TEST_PACKAGE/TEST_CALCVIEW" WHERE FiscalPeriod > 1 and FiscalPeriod <=5;

ID	FiscalPeriod	FiscalPeriod_1
2	02	2
3	02	2
4	05	5

b) SELECT * FROM "_SYS_BIC"."TEST_PACKAGE/TEST_CALCVIEW" WHERE FiscalPeriod_1 > 1 and FiscalPeriod_1 <=5;

ID	FiscalPeriod	FiscalPeriod_1
2	02	2
3	02	2
4	05	5
5	10	10
6	10	10

Since integer type has a higher precedence than string type, numeric string ('10', for instance) in column FiscalPeriod_1 is expected to be converted to integer type when being compared with integer type (1 and 5 from the where clause). Instead, integer type (1 and 5 from the where clause) is converted to string type ('1' and '5') and then such converted string values are used in comparison in the example above.

According to string comparison rules, the greater value is determined by comparing the ASCII value of each character from left to right until two distinct values are compared and one is greater.

This means:

- '10' > '1' because both have a common prefix '1', but there is a trailing character '0' in '10'.
- '5' > '10' because '5' has a greater ASCII value (53) than '1' (49) (so it does not need to compare remaining trailing characters).

Other Terms

Wrong result, Implicit conversion, SQL Optimizer, Predicate normalization, Calculation View Unfolding

Reason and Prerequisites

Issue number 258696

Reason:

Due to a programming error in SAP HANA, a non-string constant value is incorrectly converted to string type during predicate simplification by SQL optimizer. Simplification of comparison between a column cast to string unnecessarily and a constant value must be conducted only if the latter is of string type as well. However, there is a lack of type checking for the constant value during SQL optimization process. Thus, the non-string type constant is converted to the same string type of the result of the casting function unexpectedly.

In general cases, types are determined by applying the first run of predicate normalization rules by SQL Optimizer. However, in case that calculation views are involved, the type of the expression in the calculated column is determined **while the calculation view is being unfolded**. This difference causes the application of such an erroneous predicate simplification.

Affected Releases:

- SAP HANA 1:
 - Revisions <= 122.34 (SPS12)
- SAP HANA 2:
 - Revisions of SPS00 - SPS03
 - Revisions <= 048.03 (SPS04)
 - Revisions <= 054.00 (SPS05)

Prerequisites:

1. You have a calculation view with a calculated column that is expressed as a function that returns string type
2. While accessing the calculation view, the calculated column is compared with a non-string constant in WHERE-clause
3. The calculation view is unfolded during this access

Solution

Apply one of the following SAP HANA Revisions:

- SAP HANA 1:
 - Revisions >= 122.35 (SPS12)
- SAP HANA 2:
 - Revisions >= 048.04 (SPS04)
 - Revisions >= 055.00 (SPS05)

- or higher

- or higher

Workaround:

- Apply SQL Hint NO_PREDICATE_SIMPLIFICATION to avoid an unexpected predicate simplification

```
SELECT * FROM TEST_CALCVIEW WHERE FISCAL_1 >=0 AND FISCAL_1 < 2 WITH HINT(NO_PREDICATE_SIMPLIFICATION)
```

- Apply SQL Hint NO_CALC_VIEW_UNFOLDING to have the statement processed by CE optimizer instead of SQL optimizer

```
SELECT * FROM TEST_CALCVIEW WHERE FISCAL_1 >=0 AND FISCAL_1 < 2 WITH HINT(NO_CALC_VIEW_UNFOLDING)
```

- Change the output type of calculated columns to a non-string type if there is a convertible data type available
 - In the above example
 1. Go to 'Edit Calculated Column' by double-clicking FiscalPeriod_1
 2. Change 'Data Type' from NVARCHAR to **INTEGER** (this approach is acceptable since a numeric string ('123', for example) is convertible to integer type (123))
 3. Save and reactivate

Validity

Software Component	From Rel.	To Rel.	And Subsequent	
HDB	1.00	1.00		
	2.00	2.00		

Support Packages & Patches

Support Package Patches

Software Component	Support Package	Patch Level
SAP HANA DATABASE 1.00	SP122	000035
SAP HANA DATABASE 2.0	SP048	000004
	SP055	000000

References

This document is referenced by:

Customer Incident (1)

Number	Year	Title	Status	Processor	Customer Number	Customer Name
0000883466	2020		Closed		0001204070	Agua Branca Participações S/A

SAP Knowledge Base Articles (2)2142945 HAN-DB-PERF [FAQ: SAP HANA Hints](#)2222121 HAN-DB-ENG [SAP HANA Wrong Result Sets](#)**SAP Notes (3)**3020536 HAN-DB [SAP HANA 1.0 SPS 12 Database Maintenance Revision 122.35](#)3021026 HAN-DB [SAP HANA 2 SPS05 Revision 055.00](#)2997712 HAN-DB [SAP HANA 2 SPS04 Database Maintenance Revision 048.04](#)**ServiceNow Case (7)**

Number	Year	Text	Status	Processor	Customer Number	Customer

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