

CDS HIERARCHY ISSUE IN S/4 HANA 1610 AND IT'S SOLUTION FOR UPGRADE

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Abstract

SAP S/4 HANA version 1610 introduced a feature for custom SET hierarchies to be used in Reporting via Embedded Analytics. This solution provided by SAP Note 2414215 helps customers to create custom SET hierarchies and replicate it using a custom program code provided by the SAP note which works similar to HRRP_REP transaction code to be used in Reporting via CDS views. However in the subsequent versions released by SAP S/4 HANA like 1710 onwards, SAP changed the replication program logic working behind the scenes. This created issues for the Reporting Queries created using BEx Query Designer and required to be re-written. This paper discusses the possible solution for the issue which can minimize the impact of the issue and the need and efforts required to re-write the queries / reports.

Key words: SAP S/4 HANA, Embedded Analytics, ABAP CDS Views, Custom SET Hierarchies, HRRP_REP.

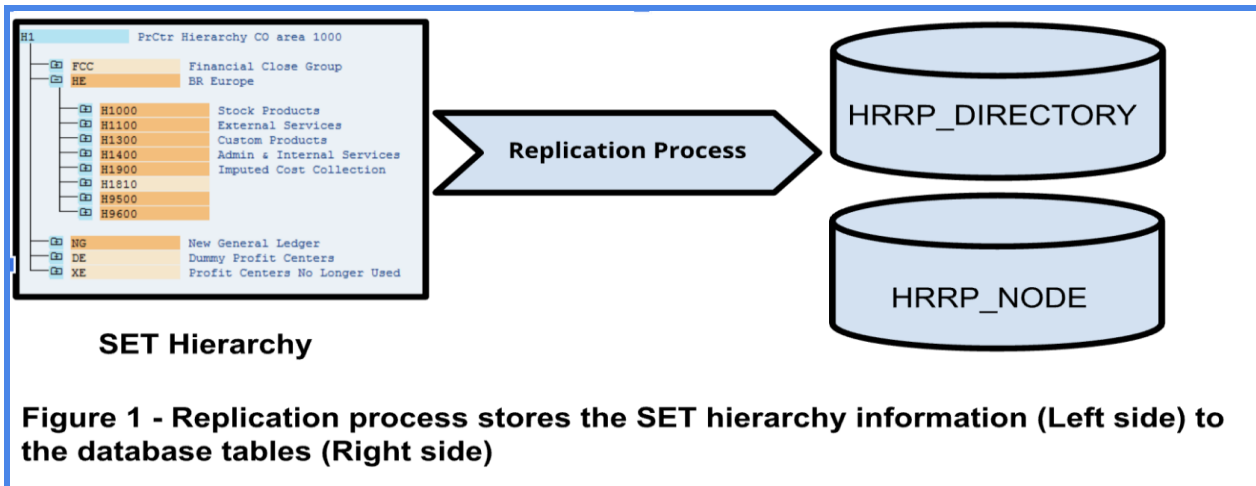
I. INTRODUCTION

Custom SET Hierarchies can be maintained using transactions GS01/02/03. They are replicated using transaction HRRP_REP and stored in database tables HRRP_NODE and HRRP_DIRECTORY. This is then consumed via Hierarchy CDS views to be in turn consumed in the Virtual data model CUBE view. This solution was introduced by SAP to help customers create their own Custom SET hierarchies and to be able to use in Reporting via Embedded Analytics. There were changes done in the subsequent versions of this Program which changed the technical keys of the nodes created using this program. Hence the definition of Variables, Filters and Key Figures defined in the BEx queries were invalidated after upgrade and hence need to be re-written. This will also impact end users as their copies of the reports utilizing these definitions will be invalidated. However, a possible solution discussed here can be implemented which will avoid the rework and end user Impact.

II. ISSUE DETAILS

The main purpose of the replication program given by SAP is to store the hierarchy information into SAP Standard Tables namely HRRP_DIRECTORY and HRRP_NODE. Specifically the later one stores the details about the Nodes defined in the hierarchy in a parent-child relationship format. i.e., the node key of every Hierarchy node is stored in a column and the node key of the parent node is stored in the same record of the table in another column. The logic to generate the node key is defined by SAP in its program routine which works behind the scenes. When a user replicates the hierarchy, all node information is stored in the tables with the parent-child

information. This helps while reading this information via CDS views.



This information is read via CDS views in the VDM (Virtual Data Model) and passed on to the upper reporting layers for Query or Report definitions.

However, SAP changed the logic of generating the NODE keys in the program for replication after version 1610. Hence the issue arises when the SAP System version is upgraded from 1610 to any higher version like 1710 or 1809 etc. This results in a new key generation as per the new logic in the upgraded system version. Since this information is being used in the query definition for consumption, BEx query designer is not able to recognize the newly generated keys and still looks for the old keys defined for the various filter, key figure definitions. Below picture shows the difference in the KEYs generated in the 1610 version and 1809 version. Here you can see that the KEY generated in the later version is very compact and has less character length compared to the previous version.

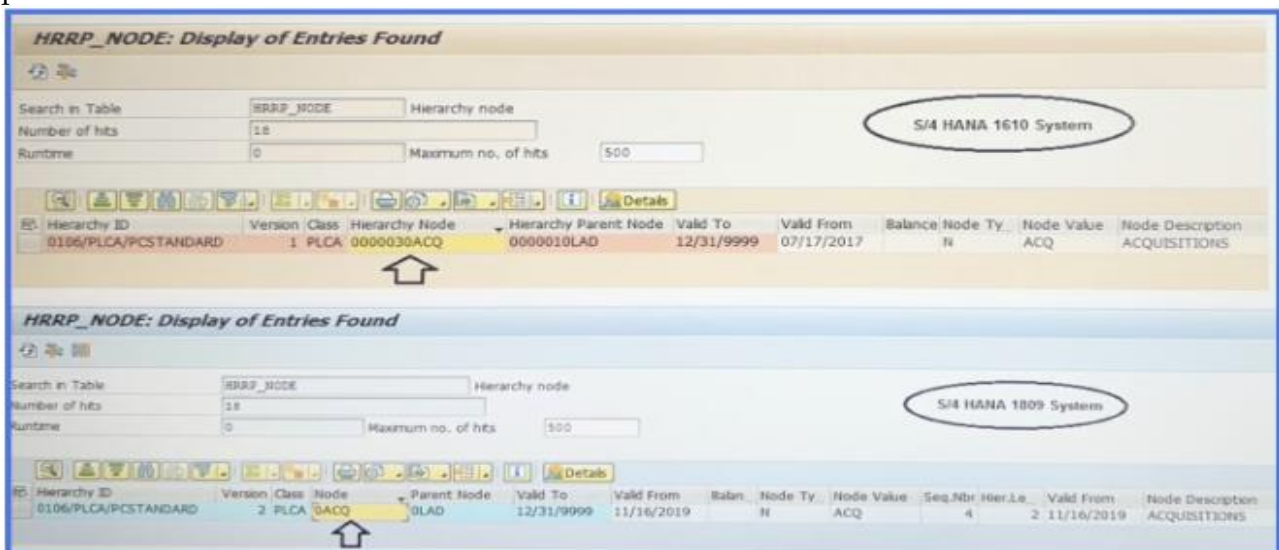
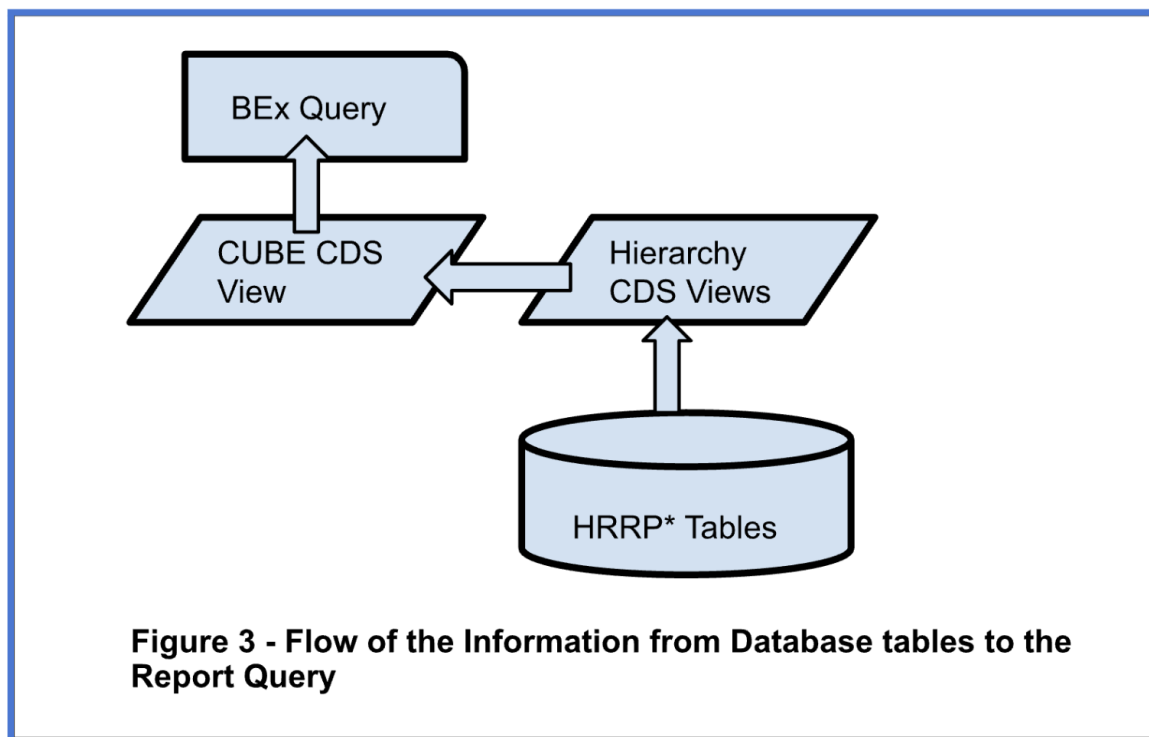


Fig 2. Difference between Node key Generated from System version 1610(Top) to System Version 1809

III. SOLUTION

As we can see from the above, the problem lies in the storage of the information in the HRRP_NODE table. This information is consumed via Hierarchy CDS views, before it can be passed to the BEx Query definition. Hence, this gives us the opportunity to alter the KEYS generated for the fields NODE and PARENT NODE in the HRRP_NODE table.



Note that there are two new columns created in the HRRP_NODE table which are sequence Number and Hierarchy level. It has been found with the analysis of multiple hierarchy information that these values combined together create a NODE KEY which was used in the older 1610 version. However, in the new version SAP introduced these fields to split the information into multiple columns and hence the NODE key has been reduced to just the node value. Hence by reversing this logic in the CDS view, old system generated NODE keys can be achieved. A simple CONCATENATE function in the CDS view coding can be used to combine these columns together and create the key of the 1610 version node.

CONCATENATE (SEQUENCE NUMBER, HIERARCHY LEVEL, NODE) AS NODE

This logic works for 90% of the cases where the NODE key in the old 1610 version matches with the newly created concatenated field in the CDS view logic. There are some exceptions where the hierarchy structure is not balanced or where the Hierarchy has two kinds of sub nodes, i.e., sub nodes with multiple lower levels as well as direct values assigned to the node. In such cases the exception cases need to be handled in the coding of CDS views. However, looking at the old system keys generated, the coding of the Hierarchy CDS views can be altered to either hardcode

the values of the NODE keys or modify the CONCATENATE logic discussed above. Following approach can be followed during the system upgrade.

IV. APPROACH FOR SYSTEM UPGRADE

During system upgrade from SAP S/4 HANA 1610 version, the values for the hierarchy nodes need to be compared either in a Sandbox environment or a N+1 environment and they need to be compared with the existing system version 1610 values. Using the following formula, the new modified values need to be determined and then compared with the 1610 version node values. Once done, the exceptions will be uncovered and then it will need to be determined that the exceptions will be separately handled in the CDS view code. Once these changes are done, the reports need to be tested to confirm that the approach is working correctly.

CONCATENATE (SEQUENCE NUMBER, HIERARCHY LEVEL, NODE) AS NODE

Following are some of the suggested steps for this approach:

1. Upgrade SAP S/4 HANA 1610 System version to a higher version determined in a separate Sandbox environment.
2. Replicate all the used custom SET hierarchies using the HRRP_REP t-code.
3. Download the records from HRRP_NODE table for the custom hierarchies from the Sandbox environment.
4. Download the records from HRRP_NODE table for the custom hierarchies from the Production environment.
5. Compare the Downloaded records in step 3 and 4 in excel sheet by applying the CONCATENATION formula given above.
6. Compare the differences and identify if there are any exceptions.
7. Modify the Hierarchy CDS views with CONCATENATION for NODE and PARENT NODE fields as well as for the exception nodes found if any in the step number 6.
8. Test the output of the CDS views with the upgraded HRRP_NODE table records and confirm that the NODE values match.
9. Test the Reports to confirm that the defined Filters, Key figures and the balances displayed match with the production environment.
10. Implement the solution in the Development environment and promote it to Production along with the system upgrade and testing.

V. ADVANTAGES

The above mentioned solution has following advantages:

1. One time modification is required in the Hierarchy CDS views.
2. Subsequent version upgrades like 2020 and above have been found to retain the same logic for replication and hence no further modification in CDS views is required.
3. Effort savings in re-writing of the report which is a huge advantage considering a short timeline for an upgrade project.
4. This approach avoids the impact to Business users as their existing reports would still work after upgrade and no rework will be required.

VI. LIMITATIONS

Though this approach has great advantages however, there are a few limitations as below:

1. The NODE definitions used in the report will remain to the older system version i.e., 1610.
2. If SAP changes the logic for the replication program in future Upgrades, there is a possibility that the CDS view coding will need to be modified again.

VII. ASSUMPTIONS

1. It is assumed that the reporting architecture used is based on CDS views.
2. It is assumed that the Hierarchy solutioning is done based on the SETs available in SAP transaction codes GS01/02/03.
3. It is assumed that the Reporting Queries are consuming the CDS Cube views in the reporting architecture in the scenario discussed in this paper.

VIII. CONCLUSION

SAP S/4 HANA System version 1610 offers great features in embedded analytics and specially with CDS view hierarchies defined via Custom SETs. However, the modification in the hierarchy replication logic by SAP after the 1610 version has created a big impact on the reports developed in the previous versions and it Impacts the entire reporting solution implemented via Embedded Analytics using CDS views and BEx queries. The solutions discussed in the paper helps in avoiding the impact on the Reporting solution and the Business users allowing the Upgrade project to be completed on time and within the budget. This approach is also based on the SAP HRRP_NODE table design and the introduced new fields in the table, avoiding the need to write purely custom logic which is subjective to the developer and always at risk of needing to be modified.

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