Matrix Consolidation in Group Reporting: An Introduction

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Introduction

Beginning with the 19xx versions of SAP's S/4HANA for Group Reporting software ("GR"), SAP changed GR's reporting functionality to support a more "intelligent" reporting logic approach. All GR releases support a full "legal" oriented financial consolidation based on the principle of consolidation groups containing an underlying entity dimension made up of companies. However, most corporations also have additional consolidated reporting requirements where reporting is needed both for reorganizations as well as for "managerial" oriented views of eliminated data along other dimensions like profit centers or segments. With the new reporting logic, GR supports these types of managerial analyses using its "Matrix Consolidation" features. This lets GR report multiple views of the same set of consolidated data by producing on-the-fly eliminated reporting beyond a consolidation group for the consolidation unit, profit center, or segment characteristics. It does this by using "virtual" elimination entities in a "first common parent" hierarchical approach when running reports.

History of Financial Consolidation and Group Reporting

Financial consolidation is the process by which the financial data of two or more entities are reported as if the organization is one single entity (i.e., a consolidation group in SAP terms). This is not the same as simply "aggregating" or "combining" data since consolidated financial statements always contain additional eliminations to adjust the effects of business activities between the various entities. SAP refers to the entities in a consolidation group as consolidation units. They are the lowest level of organizational granularity in a consolidation often equating to a legal entity or stand-alone reporting unit. Generally, a financial consolidation is "legal" oriented where companies play the role of consolidation units. Other times it is "managerial" oriented where something like profit center can fulfill this role.

Prior to the 19xx versions, SAP employed a reporting approach where, after processing all data and eliminations in the monitors, a final task called "Integration of transaction data into consolidation group" was run to populate data in GR needed for reporting. GR processed using one set of transaction data but supported multiple consolidated "legal" views for reporting by hardcoding the organizational assignments in reporting records unique to each consolidation group and retrieving these reporting records when executing reports. While this supported most "legal" consolidated financial reporting requirements, the data was locked to one consolidation group's view making reporting on reorganizations or managerial eliminated views more challenging.

Starting with the 19xx versions, SAP redid the reporting features removing the need for the "Integration of transaction data into consolidation group" task, introducing new reporting logic, and providing the ability to do managerial eliminated views of the data using Matrix Consolidation. Redundant reporting records are no longer needed thereby shrinking the size of the database and speeding up the process since no task must be run to produce reporting records prior to executing

GR reports. As the reporting logic is applied at query runtime, hardcoded organizational assignments unique to each consolidation group are not made on all GR postings allowing for greater flexibility in consolidated reporting. This allows GR to provide "Group" and "Hierarchical" consolidation views using one set of data and support flexibility in reporting reorganizations or managerial views using the Matrix Consolidation features. The "Group" view represents the traditional "legal" consolidated reporting including all group dependent postings. The "Hierarchical" view represents an alternative managerial or reorganizational perspective up through interunit elimination postings. It is also possible to report a combined view.
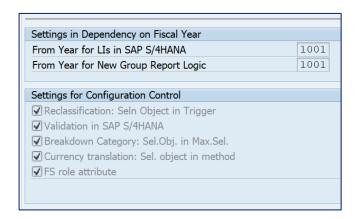
How to Implement Matrix Consolidation

To use the Matrix Consolidation features in 19xx, the following steps should be performed:

- The "new group reporting logic" features must be enabled in the Global System Settings.
- Flag the "enable hierarchy" and "enable hierarchical eliminations" settings in the "Define Consolidation Master Data Fields" IMG step for profit center and/or segment if alternative reporting on these dimensions is needed. If Matrix Consolidation features are only needed for the consolidation unit dimension, then these settings can be skipped as consolidation unit is already enabled as part of the standard GR features in 19xx.
- Create Global Accounting Hierarches for consolidation unit, consolidation profit center, or consolidation segment as needed for Matrix Consolidation reporting requirements.
- Run the monitors in GR to process data – partner unit data must exist in the source data for this to properly work based on the dimensions needed to support Matrix Consolidation (i.e., consolidation unit and trading partner, profit center and trading partner-profit center, segment and trading partner segment). In general, consolidation unit and trading partner data should already exist as that is fundamental to posting legal eliminations.
- Run Group Data Analysis reports or SAP Analysis for Office queries with the appropriate selections and navigation to report on either the "Consolidation Group" view, the "Hierarchical Matrix" view, or a combined view.

Enabling New Group Reporting Logic

The ability to use the new reporting logic and the Matrix Consolidation features is already enabled for any net new GR installation. As can be seen in Global System Settings, all configuration settings are always enabled, the starting years are set effective from year 1001, and none of these settings can be changed. This is strictly enforced by SAP Development to ensure that all functionalities are always used in any net new GR system. These settings are only changeable for customers previously using EC-CS who have upgraded the system on which it runs to S/4HANA and now wish to use GR. SAP Development recommends enabling all settings in this scenario.

Settings in Dependency on Fiscal Year	
From Year for LIs in SAP S/4HANA	1001
From Year for New Group Report Logic	1001
Settings for Configuration Control	
☑ Reclassification: Seln Object in Trigger	
☑ Validation in SAP S/4HANA	
☑ Breakdown Category: Sel.Obj. in Max.Sel.	
☑ Currency translation: Sel. object in method	
☑ FS role attribute	

The year in the "From Year for New Group Report Logic" is the business year from which the system reports data using the new group reporting logic and structures for Matrix Consolidation available in the 19xx releases. Before the start of the "effective from" fiscal year, the system uses the old group reporting logic and structures associated with GR releases 18xx and earlier. In this way, pre-19xx migrating customers can control whether and when to use the new reporting logic after an upgrade from a previous release. While it is not necessary to use the new reporting logic after an upgrade, Matrix Consolidation features require its use. Keep in mind that there is no option to disable the use of the new reporting logic once it has been enabled. It is an irreversible decision.

Please note that customers who implemented a GR release prior to 19xx can migrate from the old reporting logic to the new reporting logic only with support from SAP Development. Create a customer ticket under the component FIN-CS-COR. Data is only migrated as of the year specified for the migration during the balance carry forward execution into this year. Consequently, consolidated data before this year is not migrated and users must continue to use the prior group reports to retrieve this data. For subsequent years, use the new group reports (i.e., the "Group Data Analysis" or "Group Data Analysis - With Reporting Rules" Fiori tiles). Do not use the "Data Analysis" Fiori tile as it does not support the new group reporting and only shows consolidation groups from the old group reporting logic.

Defining Consolidation Master Data Fields

If Matrix Consolidation features are only needed for alternative reporting on the consolidation unit dimension, then no actions are needed. By default, GR is enabled for consolidation unit. Also, the Group Data Analysis user interfaces and the CDS view for AO reporting already have the "elimination" fields, and the system is already enabled for Matrix Consolidation features. If profit center or segment are needed for Matrix Consolidations, then both the hierarchy and hierarchical eliminations settings found in the consolidation master data fields maintenance screen must be flagged. This can be done by either enabling business practice content for scenario XX_3LX_OP (Group Reporting - Matrix Consolidation) or flagging on the settings manually through the IMG step "Define Consolidation Master Data Fields".

To activate best practice configuration content, use transaction code /n/SMB/BBI in the SAP GUI. The best practice content can be used, kept as a reference, or modified as needed to support various business requirements. Enabling scenario XX_3LX_OP automatically makes the changes to the master data field settings as well as provides content examples of configuration based on the best practice delivered master data in scenario XX_1SG_OP. If you do not need the sample content, then it is easier to manually enable the settings needed for profit center and segment. Hierarchical eliminations are not supported for any other master data fields besides profit center and segment. Using transaction code FINCS_ADDLFLD_SEL_U, make sure the "enable hierarchy" and "enable hierarchical eliminations" options are flagged where needed.
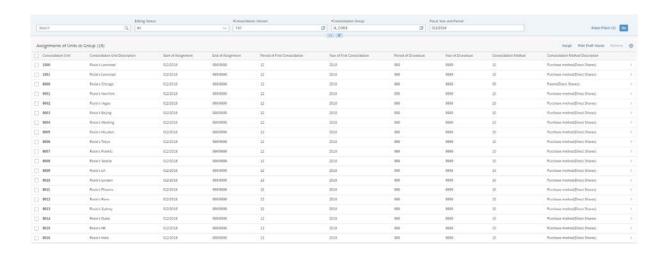

Once flagged, each enabled field will have a virtual dimension with a suffix "Eliminated" in the field name at report runtime. By using Global Accounting Hierarchies with these fields to report a "hierarchical" view, GR reports a managerial view of eliminations on posting levels 20 or 22 (interunit eliminations) at the first common parent of the selected hierarchy where the elimination consolidation unit is automatically generated with a suffix "_ELIM".

Maintaining Global Accounting Hierarchies

In prior GR releases, consolidated reporting needed the assignments of consolidation units as part of a consolidation group's master data. With the introduction of features for advanced Consolidation of Investments, Matrix Consolidations, and the new reporting logic beginning with the 19xx releases, consolidation groups are no longer arranged into a top group / sub-groups organizational structure (i.e., stepwise simultaneous consolidation). Each consolidation group is now an independent object containing a flat listing of applicable consolidation units.
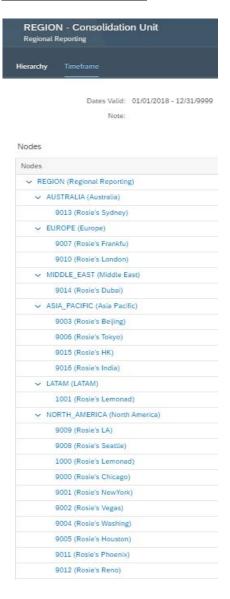
Consolidated reporting is always done referencing a consolidation group. All other characteristics, including consolidation unit, allow detailed analysis of the impacts to the consolidation group. No global accounting hierarchies on consolidation unit are needed for a purely "legal" view of consolidated data.

While it is possible to create several consolidation groups to reflect the impacts of step groups or company reorganizations, only a company can play the role of a consolidation unit. If the requirement is to see eliminated results as if a profit center or segment played the role of a consolidation unit rather than just drilldown on such information as an additional reporting element, this is not possible with consolidation groups. Furthermore, if seeing the eliminated results of alternative arrangements of consolidation units for managerial/reorganizational reporting is the requirement and group postings are not needed (i.e., posting level 30 investment eliminations), then new consolidation groups are not specifically needed. This is where Matrix Consolidation can support the requirement by allowing users to report using a "hierarchical" view of eliminated/consolidated data in addition to a "group" view.

To utilize the Matrix Consolidation features when reporting, a global accounting hierarchy for consolidation unit, consolidation profit center, or consolidation segment must be made (as needed). This whitepaper will not discuss how to create global accounting hierarchies; just the concepts related to their design for Matrix Consolidation. Please see the appropriate GR documentation for further discussion on creating global accounting hierarchies. The global accounting hierarchy on consolidation unit, profit center, or segment should represent the "managerial" perspective in hierarchical form desired when reporting. For example, the following on consolidation unit and consolidation profit center:

Consolidation Unit

Consolidation Profit Center

As can be seen in the consolidation unit hierarchy "REGION", the nineteen consolidation units that are part of consolidation group G_CONS for traditional consolidation group reporting have been organized under various nodes representing regions. The regions are text nodes and have no master data like consolidation units do. In reporting, this is a typical hierarchy that can be viewed when drilling upon data displayed by consolidation unit, meaning that a user can see a value for "Europe" that is an aggregation of data in consolidation units 9007 and 9010. When enabling the Matrix Consolidation features, this same hierarchy can be used to show a "managerial" eliminated perspective like that normally seen at a consolidation group level (i.e., an eliminated Europe instead of just an aggregated Europe). Matrix Consolidation does this by making a virtual elimination unit (e.g., Europe_ELIM, etc.), where any interunit eliminations recorded on posting levels 20 or 22 for activity between 9007 and 9010 are reflected at the first common parent of the two consolidation units in the selected hierarchy. As already mentioned, this requires trading partner information to work. If for some reason trading partner is blank, then GR cannot properly report the data. This works the same for matrix reporting of consolidation profit center or consolidation segment which require trading partner profit center and trading partner segment, respectively. While SAP provides ways to derive trading partner profit center and trading partner segment in source ERP systems, do not underestimate the configuration effort to capture this information in source G/L data if Matrix Consolidation is to be used.

It is also important to note that unlike most master data in GR, Global Accounting Hierarchies for consolidation unit, consolidation profit center, and consolidation segment <u>are</u> time dependent meaning that it is possible to show reorganizations over time based on a query key date when using the Matrix Consolidation features. As can be seen in the consolidation unit hierarchy "REGION" example above, it has a validity of 01/01/2018 – 12/31/9999. This version of "REGION" would be used if the key date entered in the "Hierarchy Valid On" selection field falls within this validity range. So, time dependency lets data posted at a specific time be reported using master data from another point in time.

*Hierarchy Valid On:	12/31/2019	📅

When time dependency is an option in reporting, there can also be multiple global accounting hierarchies with the same technical name. However, they cannot overlap in their time ranges. For example, another consolidation unit hierarchy "REGION" besides the one discussed earlier could exist valid from 01/01/2017-12/31/2017 but one could not be active from 01/01/2017-12/31/2018 as it would overlap with an existing hierarchy valid from 01/01/2018 – 12/31/9999.

Processing Data

Matrix Consolidation does not require any special tasks in the monitor or any underlying method configuration. As previously mentioned, it is a pre-requisite that the underlying data has eliminations booked at the intersection of the matrix characteristics to allow for consolidated reporting across the various supported characteristics (i.e., consolidation unit, profit center, and segment). Without this, it is not possible for GR to determine the proper point to report an elimination.
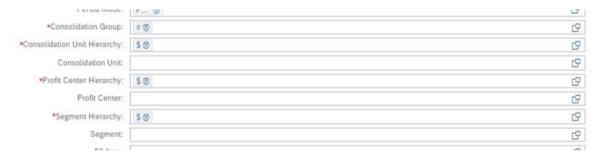

For example, the first posting level 20 record above would report using matrix features at the first point where consolidation units 9007 and 9009 are within a hierarchy node for consolidation unit or the first point where consolidation profit centers 90070 and 90090 are within a hierarchy node for consolidation profit center.

In general, trading partner should never be blank in GR as that is fundamental to posting legal eliminations. Trading partners for profit center and segment are more challenging to populate and source G/L systems will need changes to populate them on base data if Matrix Consolidation is to be used.

Reporting

When running reports via Fiori or Analysis for Office, it is possible to report the "Consolidation Group" view, the "Hierarchical Matrix" view, or a combined view. Which one occurs is based on the values entered in the selection prompt for consolidation group, consolidation unit hierarchy, profit center hierarchy (if hierarchy eliminations are enabled), and segment hierarchy (if hierarchy eliminations are enabled) in addition to other required selections needed to run a GR report like version and fiscal year.

- "Group" view – Represents the traditional GR legal and statutory consolidated reporting where a single consolidation group is selected, and reporting logic determines the appropriate data to report based on the group structure settings. For this mode, select a consolidation group other than "unassigned" (#) and leave the "hierarchy" selections as "$" (no hierarchy). The system reports the base data, all appropriate interunit eliminations for the consolidation group, and all group specific entries (i.e., preparation for consolidation group change and consolidation of investment entries).
- "Hierarchical" view – Represents an alternative matrix consolidation view based on a chosen elimination hierarchy. For this mode, select consolidation group as "unassigned" (#) and pick appropriate "hierarchy" selections for the characteristics where a matrix consolidation should report. If you do not need matrix features on a characteristic, then leave the restriction as "$" instead of picking a hierarchy. The system will report the base data and all appropriate interunit eliminations based on the pairings will be assigned to a virtual elimination entity based on the first common parent node. This is what makes an aggregation that replicates an eliminated result (i.e., adding base data on consolidations + eliminations on the virtual elimination entity). No group specific entries are reported since the consolidation group selection is unassigned (#).
- Combined view – If a consolidation group other than "unassigned" (#) is selected along with at least one elimination hierarchy, then GR reports a combined view. This is the same as what is discussed in the hierarchical matrix view except that group specific entries will also report based on the consolidation group selected and shown by the consolidation units where they were posted. All interunit eliminations still report following the first common parent approach.

After making the appropriate selections in the prompt and executing the report, the Matrix Consolidation results are shown when displaying one of the "Eliminated" dimensions in the report. In the below example, the report shows "Consolidation Unit Eliminated" indicating we are showing some form of reorganization or alternate managerial view of eliminations driven by consolidation unit. Notice that the posting level 20 entries appear on virtual elimination entities equal to the node of the first common parent elimination (e.g., 9007 and 9010 first appear together under Europe and so their eliminations report on Europe_ELIM, etc.). Consolidation unit and partner unit are still the true values meaning that even from a virtual elimination perspective it is possible to trace the source consolidation unit of elimination postings.

				GC Amount		
				00	20	Total
			Posting Level			
Consolidation Unit Eliminated ⌃	Consolidation Unit ⌃	Partner Unit ⌃	FS Item | Posting Level ⌃	Reported data: Entry	Two-sided elimination entry	
000000000000009000	9000	9001	604000	$ 0.00		$ 0.00
		9002	604000	$ 0.00		$ 0.00
		9003	604000	$ 0.00		$ 0.00
000000000000009001	9001	9000	604000	$ 400,000.00		$ 400,000.00
000000000000009002	9002	9000	604000	$ 717,721.00		$ 717,721.00
000000000000009003	9003	9000	604000	$ -513.17		$ -513.17
000000000000009007	9007	9008	604000	$ -206,000.00		$ -206,000.00
		9009	604000	$ -358,860.50		$ -358,860.50
		9010	604000	$ -1,725.00		$ -1,725.00
		9011	604000	$ -3,250.00		$ -3,250.00
		9012	604000	$ -41,465.00		$ -41,465.00
000000000000009008	9008	9007	604000	$ 200,000.00		$ 200,000.00
000000000000009009	9009	9007	604000	$ 358,860.50		$ 358,860.50
000000000000009010	9010	9007	604000	$ -256.59		$ -256.59
000000000000009011	9011	9007	604000	$ 3,250.00		$ 3,250.00
000000000000009012	9012	9007	604000	$ 41,465.00		$ 41,465.00
000000000000009014	9014	9007	604000	$ -128.29		$ -128.29
EUROPE_ELIM	9007	9010	604000		$ 1,725.00	$ 1,725.00
	9010	9007	604000		$ 256.59	$ 256.59
NORTH_AMERICA_ELIM	9000	9001	604000		$ 412,000.00	$ 412,000.00
		9002	604000		$ 717,721.00	$ 717,721.00
	9001	9000	604000		$ -400,000.00	$ -400,000.00
	9002	9000	604000		$ -717,721.00	$ -717,721.00
REGION_ELIM	9000	9003	604000		$ 3,450.00	$ 3,450.00
	9003	9000	604000		$ 513.17	$ 513.17
	9007	9008	604000		$ 206,000.00	$ 206,000.00
		9009	604000		$ 358,860.50	$ 358,860.50
		9011	604000		$ 3,250.00	$ 3,250.00
		9012	604000		$ 41,465.00	$ 41,465.00
	9008	9007	604000		$ -200,000.00	$ -200,000.00
	9009	9007	604000		$ -358,860.50	$ -358,860.50
	9011	9007	604000		$ -3,250.00	$ -3,250.00
	9012	9007	604000		$ -41,465.00	$ -41,465.00
	9014	9007	604000		$ 128.29	$ 128.29

By enabling the hierarchy display on the "Consolidated Unit Eliminated" field, a user can now see a regional view showing an eliminated Europe at the hierarchy node level. As only 9007 and 9010 were in this hierarchy node (see example in the Global Accounting Hierarchy section), GR's Matrix Consolidation appropriately eliminates those amounts while ignoring the other amounts eliminated under a different node (if the trading partner is part of the elimination hierarchy).

			Fiscal Year	2018		
			Reporting Period	12		
				GC Amount		
			Posting Level	00	20	Total
Consolidation Unit Eliminated ⬚	FS Item ⬚	Consolidation Unit ⬚	Partner Unit | Posting Level ⬚	Reported data: Entry	Two-sided elimination entry	
⌄ EUROPE	604000	9007	9008	$ -206,000.00		$ -206,000.00
			9009	$ -358,860.50		$ -358,860.50
			9010	$ -1,725.00	$ 1,725.00	$ 0.00
			9011	$ -3,250.00		$ -3,250.00
			9012	$ -41,465.00		$ -41,465.00
		9010	9007	$ -256.59	$ 256.59	$ 0.00
000000000000009007	604000	9007	9008	$ -206,000.00		$ -206,000.00
			9009	$ -358,860.50		$ -358,860.50
			9010	$ -1,725.00		$ -1,725.00
			9011	$ -3,250.00		$ -3,250.00
			9012	$ -41,465.00		$ -41,465.00
000000000000009010	604000	9010	9007	$ -256.59		$ -256.59
EUROPE_ELIM	604000	9007	9010		$ 1,725.00	$ 1,725.00
		9010	9007		$ 256.59	$ 256.59

	Fiscal Year	2018		
	Reporting Period	12		
		GC Amount		
	Posting Level	00	20	Total
Consolidation Unit Eliminated ⬚	FS Item | Posting Level ⬚	Reported data: Entry	Two-sided elimination entry	
⌄ EUROPE	604000	$ -885,841.40	$ 1,981.59	$ -883,859.81
000000000000009007	604000	$ -873,310.00		$ -873,310.00
000000000000009010	604000	$ -12,531.40		$ -12,531.40
EUROPE_ELIM	604000		$ 1,981.59	$ 1,981.59

	Fiscal Year	2018		
	Reporting Period	12		
		GC Amount		
	Posting Level	00	20	Total
Consolidation Unit Eliminated ⬚	FS Item | Posting Level ⬚	Reported data: Entry	Two-sided elimination entry	
＞ EUROPE	604000	$ -885,841.40	$ 1,981.59	$ -883,859.81

As with other fields, it is possible to perform drilldowns and analyze data in the same way as when reporting a consolidation group. Thus, it is possible to show a matrix-like "managerial" result using alternative eliminated roll-ups of consolidation units, profit centers, or segments, as well as to show certain reorganized/restated results. Matrix Consolidation features also work with rules-based reporting.

Key Points on Matrix Consolidation

- SAP supports a full "legal" oriented financial consolidation based on consolidation groups containing companies as the underlying entity dimension. Matrix consolidation is a way to support certain complex consolidated reporting requirements where reporting is needed both for reorganizations as well as for "managerial" oriented views of eliminations along other dimensions like profit center or segment.
- Allows GR to provide "Group" and "Hierarchical" consolidation views using one set of data and support flexibility in reporting reorganizations or managerial views.
- It is only supported for the consolidation unit, profit center, and segment characteristics (if hierarchical eliminations are enabled in the case of profit center and segment).
- Requires using the new GR reporting logic available starting with the 19xx releases.
- Requires partner information to exist on source data for matrix consolidation to properly report data. Do not underestimate the challenge to deriving fields like trading partner profit center or trading partner segment in source G/L systems.
- GR creates "virtual" elimination entities reporting via a "first common parent" hierarchical approach when running reports. Global accounting hierarchies organize the data.
- Reporting is possible in Fiori or Analysis for Office.
- Can be used in rules-based reporting as well.

Conclusion

Matrix Consolidation coupled with the new reporting logic is GR's way to show matrix-like managerial results including the impacts of eliminations. By using the different combinations of views offered in Matrix Consolidations, it is possible to show reorganizations, restatements, and alternative presentations of eliminated data without necessarily having to create more consolidation groups and process additional sets of transaction data to show "legal" and "managerial" results.

Please visit the Resource Section of our website to access an additional whitepaper which discusses how to use Matrix Consolidation features to dynamically restate consolidated data versus creating additional consolidation groups when working with the consolidation unit dimension.

Additional Information

About the Author

Michael Goldman is a Senior Principal Consultant at TruQua Enterprises specializing in SAP Consolidation applications (EC-CS, SEM-BCS, BPC Standard, BPC Embedded, EPM, and Group Reporting on S/4HANA) and SAP NetWeaver Business Warehouse (BW) data modeling, extraction, report design, and performance tuning. He is a seasoned consultant with more than 20+ years of experience delivering successful projects as a trusted advisor to a diverse range of customers. Michael is skilled at guiding customers through blueprint workshops and the redesign of businesses processes, facilitating configuration, and providing knowledge transfer to help customers meet business requirements with minimal time and cost. He is a recognized subject matter expert and prior to joining TruQua was a member of SAP's Platinum Consulting Group.

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