

KDD031 - Cross-Company Transport Consolidation

Status	Approved
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Issue

On the roadmap of Syensqo is to consolidate multiple GBU warehouses into a single warehouse. By doing so it will be possible to arrange shipments by postal code and to arrange milkrun orders for trucking companies, optimising the truck capacity and order handling. With the higher truck capacity, not only transportation costs can be reduced, but this will also have a positive environment impact, which fits Syensqo's sustainability strategy.

By combining multiple deliveries into one freight order, users don't need to be concerned about splitting freight costs over the different material items. The SAP system is capable to distribute freight charges. This will reduce the handling time of users dealing with multiple freight orders for arranging milkrun transports outside of the system.

SAP TM was originally developed to support transportation service providers. This means that many of the tools required to support consolidation scenarios are available in the system. The system is capable to distribute and allocate transportation costs to the correct company code. However, to ensure that the company code that incurred the full freight invoice is compensated by the company code that is using the transportation service, an intercompany billing process needs to be setup that reflect the transportation costs allocated to each participating company code. These transactions need to be recorded in both the sending and receiving company codes ledgers. The accounting entries generated are explained in the below paragraphs.

Recommendation

The recommendation is to **extend SAP standard Transportation Management with a custom development to allow cross-company consolidations**, including distribution of invoice differences.

It is quite common for companies that operate with multiple company codes in one country to extend the standard SAP solution to support cross company consolidation. Considering the company structure and the roadmap of Syensqo cross company consolidation provides an important opportunity with the new ERP Rebuild system.

Invoice differences are common in transportation operations (e.g. difference is weight measurement or discrepancies in actual distance), so allowed tolerances with freight invoices are desirable. To make sure all freight costs are properly distributed to the origin, invoice differences must follow a proper cost distribution, rather than be simply written off to a differences account in the entity booking the invoice.

Glossary

Freight Order - Order for which transportation services are ordered with a carrier and execution is tracked. The content of the transportation order is filled with materials from the outbound or inbound delivery.

Cost Distribution - In the freight order the charges can be distributed among the cargo items. Higher utilisation of a freight order by a delivery, the higher percentage of the transportation costs are attributed to this delivery. This distribution will be reflected into the accounting.

Freight PO - A Freight PO is a purchase order that is generated to cater for invoice verification process. The charges calculated on the freight order are posted and represented on this type of service purchase order.

Service Entry Sheet (SES) - A document that contains confirmation of services that have been performed by the Supplier.

Settlement Management Documents (SMD) - Accounting document that contains the result of the cost distribution as calculated in the freight order. The SMD contains the currency value, it contains the reference to the original documents and materials, it determines the G/L account where charges need to be posted to.

Intercompany Settlement - Transaction between companies to resolve unequal balances. It will create and post intercompany balancing entries to ensure each company's net balance equals zero.

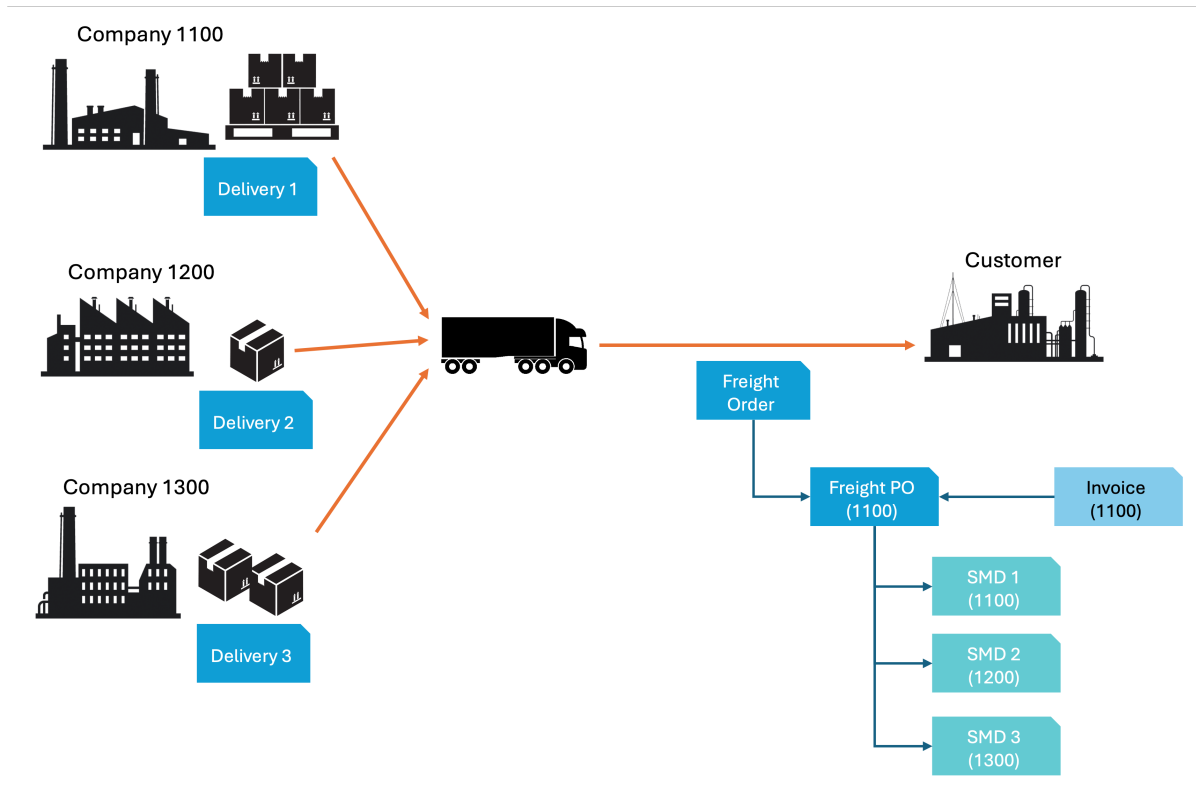
Background & Context

In consolidation scenario's multiple deliveries can be combined to optimise transportation capacity. There can be many scenario's where cargo can be combined into one order, e.g. multiple deliveries into one container, milkrun scenarios, multi containers combined into one freight booking, etc. To make this possible for multiple company codes then certain functions need to be custom built.

Description of a scenario:

Lets consider a simple scenario where cargo for one customer is combined into one container.

1. Cargo is picked up at plant for company code 1100.
2. Additional cargo is loaded into the same container at plant for company code 1200.
3. Additional cargo is loaded into the same container at plant for company code 1300.
4. Truck delivers container at customer.
5. One Freight Order is created for transportation of the entire shipment
6. Transportation charges are calculated on the Freight Order.
7. Cost Distribution (standard SAP) is distributing the costs based on cargo weight.
8. Freight charges are posted in a Freight PO for invoice verification. This is on company code 1100 only.
9. At the same time when the Freight PO is posted, the system is posting Settlement Management Documents (SMD) which assign a proportion of the transportation charges to each company code. This is based on the Cost Distribution. (standard SAP).
10. For the SMD documents for company code 1200 and 1300, the system will create an Intercompany Settlement (custom built) to compensate company code 1100 for the freight costs to be paid to carrier.
11. When the invoice is received, then this is verified and posted against the Freight PO in Company Code 1100.
12. Invoice differences are posted against price differences account (standard) or additional SMD documents are generated to distribute the invoice differences (custom built).



Option A) No Cross Company Consolidation

To have an understanding of what the issue is with standard solution, a short description of what happens in the system when there are no enhancements.

When the Freight-PO and SES are posted, the system is parking the costs on the Freight Clearing account. Subsequently the SMD posting has to balance the clearing account by assigning the freight charges to the correct expense account. When there are multiple company codes involved, then these costs are posted to an account in a different company code. When this happens, the Freight Clearing accounts will be out of balance. Those will be considered discrepancies in the accounting and need to be resolved.

For this reason, if there are no enhancements applied, the standard configuration is to prevent consolidation across company codes.

Event	GR/IR FOR FREIGHT CoCo. 1100	FREIGHT CLEARING CoCo. 1100	FREIGHT EXPENSE CoCo. 1100	AP FOR FREIGHT CoCo. 1100	PRICE DIFFERENCES CoCo. 1100
1) Creation of PO and SES	10,000.00	10,000.00			
2) SMD Posting 1100		5,000.00	5,000.00		
3) Invoice Posting	10,000.00			10,300.00	300.00
	0.00	5,000.00	5,000.00	-10,300.00	-300.00
	GR/IR FOR FREIGHT CoCo. 1200	FREIGHT CLEARING CoCo. 1200	FREIGHT EXPENSE CoCo. 1200	AP FOR FREIGHT CoCo. 1200	PRICE DIFFERENCES CoCo. 1200
2) SMD Posting 1200		3,000.00	3,000.00		
	0.00	-3,000.00	3,000.00	0.00	0.00
	GR/IR FOR FREIGHT CoCo. 1300	FREIGHT CLEARING CoCo. 1300	FREIGHT EXPENSE CoCo. 1300	AP FOR FREIGHT CoCo. 1300	PRICE DIFFERENCES CoCo. 1300
2) SMD Posting 1300		2,000.00	2,000.00		
	0.00	-2,000.00	2,000.00	0.00	0.00

Option B) Accounting postings including Invoice Differences posted to Price Differences

The sequence of account postings in the solution where invoice differences are posted to price differences are as following:

Event 1) Creation of PO and SES

Event Description: When posting freight charges from TM to ERP, the system will generate a Freight-PO and Service Entry Sheet (SES). In this process the SES is a technical document to support the end-to-end process.

Accounting: The system will post the charges against a Freight Clearing account.

Event 2) SMD Posting

Event Description: Automatically after creating the F-PO and SES the system will immediately create SMD documents.

Accounting: For each SMD document the freight charges are posted against a Freight Expense account. These charges are booked against the Freight Clearing account if the SMD document is the same Company Code as the related F-PO. If the SMD document is in a different Company Code than the F-PO, then freight charges are booked against an Intercompany Settlement account, and in the Company Code of the F-PO a booking is generated from Freight Clearing account to Intercompany Settlement account.

Event 3) Invoice Posting

Event Description: When an invoice is received, then this is entered in the system. Invoices can have invoice differences.

Accounting: The system will clear the GR/IR for Freight account. If there are any differences in the amount of the invoice and the GR/IR amount then these differences will be posted against a Price Differences account.

Event 4) Intercompany Allocation Cycle

Event Description: From an accounting perspective Company Code 1100 operated as a central procurement of freight services.

Consequently the procuring Company Code recharges the affiliates with the freight services 'consumed' by the affiliates. This can be done by Intercompany Allocation cycles using using Universal Allocation.

Accounting: Open Intercompany Settlements are recharged and made payable between to 'central' Company Code.

Event	GR/IR FOR FREIGHT CoCo. 1100	FREIGHT CLEARING CoCo. 1100	FREIGHT EXPENSE CoCo. 1100	IC SETTLEMENT CoCo. 1100	AP FOR FREIGHT CoCo. 1100	PRICE DIFFERENCES CoCo. 1100	AR CoCo. 1100
1) Creation of PO and SES	10,000.00	10,000.00					
2a) SMD Posting 1100		5,000.00	5,000.00				
2b) SMD Posting 1200		3,000.00		3,000.00			
2c) SMD Posting 1300		2,000.00		2,000.00			
3) Invoice Posting	10,000.00				10,300.00	300.00	
4a) IC Cost Allocation 1200				3,000.00			3,000.00
4b) IC Cost Allocation 1300				2,000.00			2,000.00
	0.00	0.00	5,000.00	0.00	-10,300.00	300.00	5,000.00
	GR/IR FOR FREIGHT CoCo. 1200	FREIGHT CLEARING CoCo. 1200	FREIGHT EXPENSE CoCo. 1200	IC SETTLEMENT CoCo. 1200	AP FOR FREIGHT CoCo. 1200	PRICE DIFFERENCES CoCo. 1200	
2b) SMD Posting 1200			3,000.00	3,000.00			
4a) IC Cost Allocation 1200			3,000.00	3,000.00	3,000.00		
	0.00	0.00	3,000.00	0.00	-3,000.00	0.00	
	GR/IR FOR FREIGHT CoCo. 1300	FREIGHT CLEARING CoCo. 1300	FREIGHT EXPENSE CoCo. 1300	IC SETTLEMENT CoCo. 1300	AP FOR FREIGHT CoCo. 1300	PRICE DIFFERENCES CoCo. 1300	
2c) SMD Posting 1300			2,000.00	2,000.00			
4b) IC Cost Allocation 1300			2,000.00	2,000.00	2,000.00		
	0.00	0.00	2,000.00	0.00	-2,000.00	0.00	

Option C) Accounting postings including Invoice Differences posted to origin

The sequence of account postings in the solution where invoice differences are posted to origin are as following:

Event 1) Creation of PO and SES - Same as Event 1 for Option B.

Event 2) SMD Posting - Same as Event 2 for Option B.

Event 3) Invoice Posting

Event Description: When an invoice is received, then this is entered in the system. Invoices can have invoice differences.

Accounting: The system will clear the GR/IR for Freight account. If there are any differences in the amount of the invoice and the GR/IR amount then these differences will be posted against the Freight Clearing account.

Event 4) SMD for Invoice

Event Description: Automatically after posting the Invoice, in case of invoice differences the system will immediately create SMD documents. The system will collect SMD documents of the F-PO and distribute the invoice differences according to the same ratio. For these amounts new SMD documents are generated.

Accounting: The logic for SMD documents with invoice differences follow the same logic as normal freight SMD documents. Freight charges are posted against a Freight Expense account. If the SMD is the same Company Code as the related F-PO then it is booked against the Freight Clearing account. If the SMD document is in a different Company Code than the F-PO, then freight charges are booked against an Intercompany Settlement account, and in the Company Code of the F-PO a booking is generated from Freight Clearing account to Intercompany Settlement account.

Event 5) Intercompany Allocation Cycle - Same as Event 4 for Option B.

Event	GR/IR FOR FREIGHT CoCo. 1100		FREIGHT CLEARING CoCo. 1100		FREIGHT EXPENSE CoCo. 1100		IC SETTLEMENT CoCo. 1100		AP FOR FREIGHT CoCo. 1100		AR CoCo. 1100	
1) Creation of PO and SES		10,000.00	10,000.00									
2a) SMD Posting 1100				5,000.00	5,000.00							
2b) SMD Posting 1200				3,000.00			3,000.00					
2c) SMD Posting 1300				2,000.00			2,000.00					
3) Invoice Posting	10,000.00		300.00						10,300.00			
4a) SMD for Invoice 1100				150.00	150.00							
4b) SMD for Invoice 1200				90.00			90.00					
4c) SMD for Invoice 1300				60.00			60.00					
5a) IC Cost Allocation 1200							3,090.00				3,090.00	
5b) IC Cost Allocation 1300							2,060.00				2,060.00	
	0.00		0.00		5,150.00		0.00		-10,300.00		5,150.00	
	GR/IR FOR FREIGHT CoCo. 1200		FREIGHT CLEARING CoCo. 1200		FREIGHT EXPENSE CoCo. 1200		IC SETTLEMENT CoCo. 1200		AP FOR FREIGHT CoCo. 1200			
2b) SMD Posting 1200					3,000.00		3,000.00					
4b) SMD for Invoice 1200					90.00		90.00					
5a) IC Cost Allocation 1200							3,090.00			3,090.00		
	0.00		0.00		3,090.00		0.00		-3,090.00			
	GR/IR FOR FREIGHT CoCo. 1300		FREIGHT CLEARING CoCo. 1300		FREIGHT EXPENSE CoCo. 1300		IC SETTLEMENT CoCo. 1300		AP FOR FREIGHT CoCo. 1300			
2c) SMD Posting 1300					2,000.00		2,000.00					
4c) SMD for Invoice 1300					60.00		60.00					
5b) IC Cost Allocation 1300							2,060.00			2,060.00		
	0.00		0.00		2,060.00		0.00		-2,060.00			

Assumptions

Consolidation Across Legal Entities

This KDD is written in the assumption that it covers consolidation across multiple legal entries. When there are multiple GBU's within the same Company Code, then the scenario is not considered a cross company consolidation; standard TM will already handle this situation.

Consolidation across different SAP Instances

With embedded SAP TM in S/4 HANA it is not possible to cater for cases where different company codes are operating in different SAP Instances. This will be out of scope.

Expense Account vs Stock Account

This document focuses on the expense account for freight costs, which is mostly applicable in the outbound scenario. Conversely, in the inbound scenario, the stock account is posted with the freight cost. Nevertheless, the same logic applies.

Organisational Structure of Transportation Planning

As currently transportation planners are embedded in the GBU, it is assumed that future organisational structure will have more centralised grouping. This grouping can be done by Geography (plants that are located close to each other), Mode of Transport, Special Business Process (e.g. Integration with external TMS, Shuttling Capacity).

How this transportation planning grouping will look like, will be part of detailed design.

GBU-level cost reporting

Freight costs are distributed down to delivery items level. To analyse freight costs per plant / company code / GBU level, the reports need to be based on distributed costs from SMD documents.

Constraints

Authorisations

In the authorisation concept, the requirements for transportation will be included in such a way that transportation planners have the necessary authorisations to view, create and edit documents for multiple business units. There where data is considered sensitive only dedicated transportation planners can view business documents where they have been specifically authorised for.

Regulatory Compliance Ocean Freight

When consolidation is going to be done for Ocean Freight (co-loading into one container), documentation needs to comply with regulations. The forms to be generated from the system have to comply with these regulations. If there are regulations that prohibit co-loading, then Cross-Company Consolidation will be out of scope for Ocean Freight.

This will not prohibit the decision of this document as most cross company consolidation will be for road freight.

Impacts

When transportation planners perform planning work for multiple business units, there can be impact on the organisational assignment of these planners. Should transportation planners stay on the payroll of the GBU, or should they be reassigned to a shared service organisational unit? In certain cases it might be important to anticipate these organisational structure consequences.

Business Rules

Business Rules in Consolidation

Where materials are not to be consolidated, Dangerous Goods integration and incompatibilities will be used to automatically check transportation planning results (part of Advanced TM version; see [KDD030 - SAP Transportation Management version](#)).

Evaluation

Consolidated transport across multiple company codes is an opportunity that can be fulfilled with the use of SAP TM. It gives greater flexibility to transportation planners to optimise the use of transportation capacity and to save costs.

With invoice differences distributed across freight, it gives the most accurate accounting result, and each company will pay their fair share of the transport costs.

	Option A: No Cross-Company Consolidation	Option B: Cross-Company Consolidation with Invoice Difference as Price Differences	Option C: Cross-Company Consolidation with Invoice Difference posted to Origin
Transportation Optimisation	⊖ Not possible to increase truck / container utilisation by making consolidations in the system. ⊖ Not possible to automate transportation consolidation across company codes. ⊖ Performing transportation planning for a shared warehouse (multi company codes) will be complicated.	⊕ Higher utilisation of truck / container capacity, reducing transportation costs. ⊕ Sustainability gains	⊕ Higher utilisation of truck / container capacity, reducing transportation costs. ⊕ Sustainability gains
Order Handling	⊖ When user would like to consolidate for multiple company codes, the user has to manage this outside of the SAP system.	⊕ Easier planning in case a warehouse services multiple company codes. ⊕ Less orders to be generated and tracked in case of consolidation	⊕ Easier planning in case a warehouse services multiple company codes. ⊕ Less orders to be generated and tracked in case of consolidation
Cost Distribution	⊕ All transportation costs are assigned to the correct company code.	⊖ Invoice differences are not incurred by the company code that consumed the freight.	⊕ All transportation costs are assigned to the correct company code.
Reporting		⊖ Invoice differences are not included in reported transportation costs.	⊕ All transportation costs are distributed to cargo items
Organisational Structure	⊕ No impact on organisational structure when transportation planners are assigned to one business unit.	⊕ Possibility to create Shared Service Centres for transportation planning. ⊖ Could have impact on which payroll transportation planners should be assigned to.	⊕ Possibility to create Shared Service Centres for transportation planning. ⊖ Could have impact on which payroll transportation planners should be assigned to.

Development	No enhancement required.	Medium complex enhancement required to support the process	Medium / high complex enhancement required to support the process
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Change log

Version	Published	Changed By	Comment
CURRENT (v. 27)	Aug 26, 2024 11:14	VAN OS-ext, Nico	
v. 26	Aug 22, 2024 16:26	VAN OS-ext, Nico	
v. 25	Aug 22, 2024 14:35	VAN OS-ext, Nico	
v. 24	Aug 22, 2024 14:34	VAN OS-ext, Nico	
v. 23	Aug 14, 2024 10:16	WENNINGER-ext, Sascha	
v. 22	Aug 13, 2024 14:50	WENNINGER-ext, Sascha	
v. 21	Aug 13, 2024 14:47	WENNINGER-ext, Sascha	
v. 20	Aug 12, 2024 13:54	WENNINGER-ext, Sascha	
v. 19	Aug 12, 2024 09:33	WENNINGER-ext, Sascha	
v. 18	Aug 08, 2024 16:45	VAN OS-ext, Nico	

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Workflow history

Title	Last Updated By	Updated	Status
There are no pages at the moment.			

Workflow history

This view shows the 5 most recent entries. The complete workflow log is available from the 'Document Activity' menu item.

Sept 27, 2024	Actor	Type	Activity	Version
Approved	FALL-ext, Cheikh	State	changed state to Approved at 12:22 pm	v27
Pending SteerCo Review	FALL-ext, Cheikh	State	gave <i>Final Approval</i> approval at 12:22 pm	
Sept 26, 2024				
	FALL-ext, Cheikh	State	changed expiry date to '10 Oct, 2024 01:16 pm' at 1:16 pm	
		State	changed state to Pending SteerCo Review at 1:16 pm	v27
Pending Stakeholder Review	FALL-ext, Cheikh	State	gave <i>Stakeholder Review</i> approval at 1:16 pm	
Sept 11, 2024				
	FALL-ext, Cheikh	State	changed expiry date to '18 Sept, 2024 03:54 pm' at 3:54 pm	
		State	changed state to Pending Stakeholder Review at 3:54 pm	v27