

Transportation Chain-Shipping Cost Calculation for Multi leg with Different Vendors in SAP



Applies to:

Transportation Chain – Shipping Cost Calculation for Multi leg with different vendors. SAP Transportation Module. For more information, visit the [Enterprise Resource Planning homepage](#).

Summary

This article explains about the shipping cost calculation for transportation chain model when different vendors are involved at each leg. This article also explains the importance of multi-dimensional condition type and the use of it.

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Author Bio

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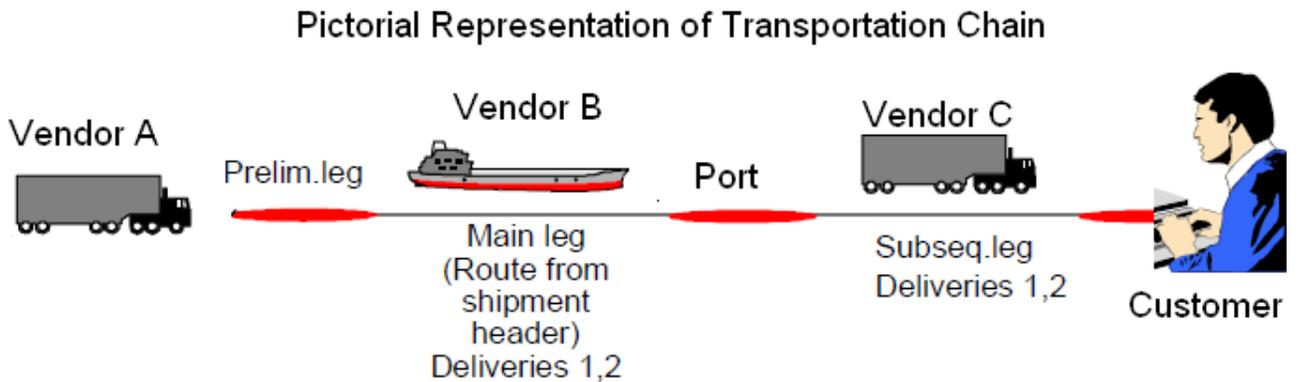
Overview

A transportation chain is useful if you are dealing with deliveries that will be transported using multiple modes of transportation (and are thus processed by different departments at the transportation planning point). In the below configuration we are showing how SAP will calculate the shipping cost if there are three vendors doing logistics for a single shipment document. And also the way the freight costs are calculated for this vendors are totally different. In the below we are doing the model as per below

Vendor A has to be paid based on Weight/ Distance

Vendor B has to be paid based on Pallet/Distance

Vendor C has to be paid based on container



Configuration to enable shipping cost for different vendors

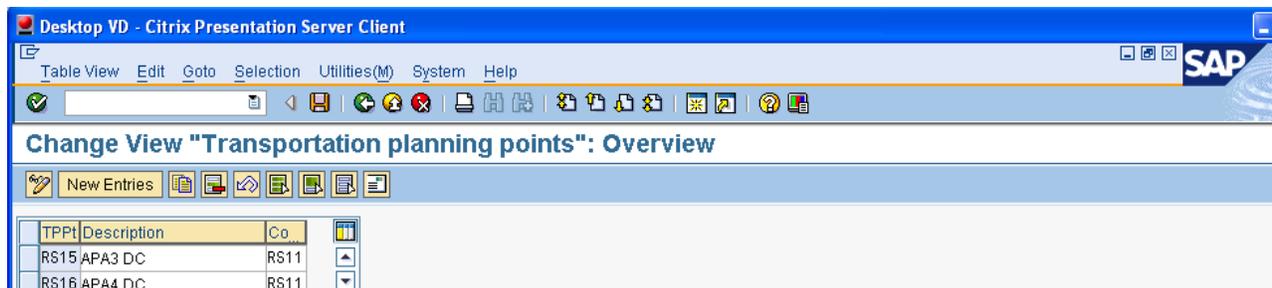
Below is the list of Configurations to enable Transportation Chain Model

Transportation Planning Point

Create a new transportation planning point or the existing transportation planning point can be used if the country is enabled with the shipment module and also assign the company code corresponding to the transportation planning point.

Configuration Path

SPRO → Enterprise Structure → Definition → Logistics Execution → Maintain Transportation Planning Point



Define New Shipment Type

The shipment types represent the different forms of transportation processing in sales and distribution. The following forms of transportation processing are distinguished:

In an **individual shipment**, one or more deliveries are transported by a single mode of transport from one point of departure to one final destination.

In a **collective shipment**, one or more deliveries are transported by a single mode of transport from one or more points of departure to one or more final destinations.

In a **multimodal shipment**, deliveries are transported by several modes of transport between one or more points of departure and one or more final destinations.

In our model we are using the multimodal shipment which can also be called as transportation chain

Configuration Path

SPRO → Logistics Execution → Transportation → Shipments → Define Shipment Types

Change View "Shipment Types": Details

Shipment type: 0T04 | Outbound Truck - 4
 Document cat.: 8 | Shipment

Number Systems
 NR int. assgt.: Z1 | No. range ext.:
 Scr. seq. group: T

Document Content
 ShpmtComplType: 1 | Loaded outbound shpmt | Shipping type: 01 | Truck
 Service Level: 8 | Pre-Loading Inbev | ShTypePrelimLeg:
 ProcessControl: 1 | Individual shipment uslr | SubseqLegShType:
 Leg Indicator: 4 | Direct leg
 Adopt route: Adopt all stages
 Determine legs: 1 | 1: Legs determined according to departure point & itinerary
 GR-RelevanceInd: Normal

Control
 Application: V7 | TextDetermProc.: Z3 | PartnDet.Proc.: TR
 OutputDet.Proc.: V7STR | Deadlines: WS STANDARD TRA
 Pick check: Shipment completion only for full picking
 SplProfBeforePig:
 SplProfAfterPig:
 HUs relevant for DI generation

Proposal
 Weight unit: KG
 Volume unit: CD3
 Output Type: CMR1

Define Shipment Number Range per shipment type

In this step we define the number range for shipment types

Configuration Path

SPRO → Logistics Execution → Transportation → Shipments → Define Number Ranges for Shipment

Screen Shot below

Note: The screen shot attached is for reference only

Display Number Range Intervals

NR Object: Shipments

| No. | From number | To number | Current number | Ext. |
|-----|-------------|------------|----------------|-------------------------------------|
| 01 | 0000001000 | 0000009999 | 1079 | <input type="checkbox"/> |
| 02 | 0001000000 | 0009999999 | | <input type="checkbox"/> |
| Z1 | 0010000000 | 0019999999 | 10004630 | <input type="checkbox"/> |
| Z2 | 0000100000 | 0000999999 | 100050 | <input type="checkbox"/> |
| Z3 | 0020000000 | 0029999999 | | <input checked="" type="checkbox"/> |

Main Leg Screen

The screenshot shows the SAP Change View 'Route Stages': Details for Itinerary 2. The route is T00000, Truck, same day delivery. The stage is highlighted with a red box. The 'Locations' section shows 'Dep. point' as RU_PORTA (RT A) and 'Dest.point' as RU_PORTB (PORT B). The 'Processing' section includes 'Service agent' 301685 (KREMER Chare1), 'Distance' 100 KM, 'Leg indicator' 2 Main leg, 'Stage category' 1 Transportation, 'Shipping type' (empty), 'Special proc.' (empty), and 'Procedure' ZRUTS2 Test of Trans Chn Prc 2 P17Dst. The 'Scheduling' section has 'Total duration' and 'Travel duration' fields, and 'Working times' and 'FactoryCalendar' dropdowns.

Subsequent Leg

The screenshot shows the SAP Change View 'Route Stages': Details for Itinerary 3. The route is T00000, Truck, same day delivery. The stage is highlighted with a red box. The 'Locations' section shows 'Dep. point' as RU_PORTB (RT B) and 'Dest.point' as TRUCK (Truck). The 'Processing' section includes 'Service agent' 301532 (SOCIETE IMMOBILIERE BALEZO), 'Distance' 200 KM, 'Leg indicator' 3 Subsequent leg, 'Stage category' 1 Transportation, 'Shipping type' (empty), 'Special proc.' (empty), and 'Procedure' ZRUT63 Test of Trans Chn Prc 3 Cont. The 'Scheduling' section has 'Total duration' and 'Travel duration' fields, and 'Working times' and 'FactoryCalendar' dropdowns.

In the Above screen we have defined the first preliminary leg stage with service agent assigned to this stage and also distance to calculate the shipment cost.

Assigning the service agent is optional but the same needs to be entered during shipment processing for all the stages if the service agent is not entered in the configuration.

We also need to define whether the route stage is relevant for shipment cost and assign the pricing procedure which will calculate the shipment cost.

Define and Assign Activity Profiles for shipment types

The activity profile outlines possible activities to be executed in the shipment document when the shipment has reached a certain status. You can define a separate activity profile for each status.

Possible activities include:

- posting goods issue for deliveries currently in shipment
- billing deliveries currently in shipment
- printing certain outputs

Configuration

SPRO → Logistics Execution → Shipments → Define and Assign Activity Profiles

The screenshot shows the SAP SPRO configuration screen for 'Activity Profiles for Shipment Types'. The table below lists various shipment types and their associated activity profiles.

| ShTy | Description | For planning | At check-in | At load_start | At load_finish | At completion | At shpmt begin | At shpmt_end |
|------|-----------------------|--------------|-------------|---------------|----------------|----------------|----------------|--------------|
| 0001 | Indiv.Shipmt - Road | | | | | | | |
| 0002 | Collect.Shipmt - Road | | | | | | | |
| 0003 | Collective Shipment | | | | | | | |
| 0004 | Prelim. leg by road | | | | | | | |
| 0005 | Main leg by sea | | | | | | | |
| 0006 | Subseq. leg by road | | | | | | | |
| 0010 | Inbound Shipment | | | | | | | |
| 1P04 | Inbound Pick-up - 4 | MRP | CHECK IN | LOG ONLY | LOG ONLY | POST 61 NO RET | SHIPMENT START | SHIPMENT END |
| 1P07 | Inbound Pick-up - 7 | LOG ONLY | LOG ONLY | LOG ONLY | LOG ONLY | POST 61 NO RET | LOG ONLY | LOG ONLY |

Define Shipment Cost types and Item Categories

In this step we define shipment cost type and assign the item categories.

Configuration Path

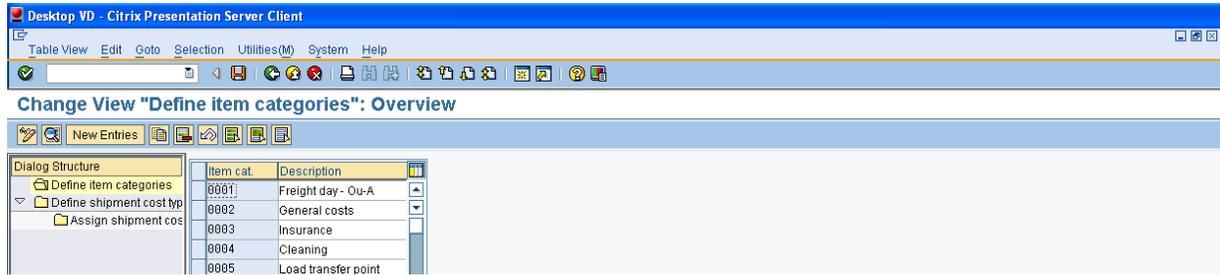
SPRO → Logistics Execution → Transportation → Shipment Costs → Shipment Cost Document → Shipment Cost Type and Item Categories

Define Shipment Cost Type

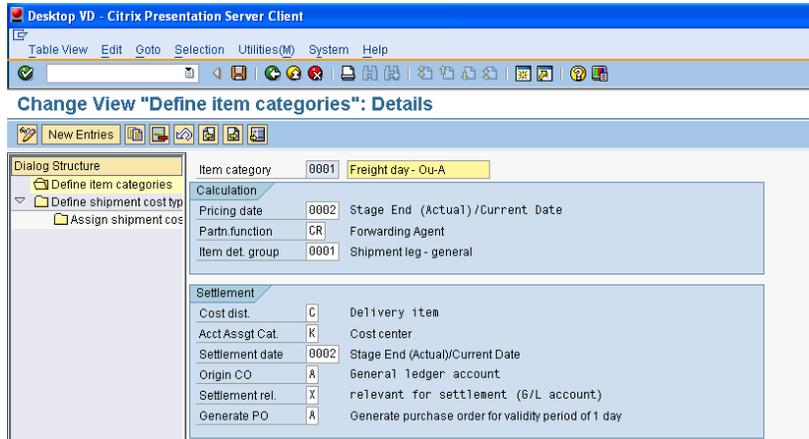
The screenshot shows the SAP SPRO configuration screen for 'Define shipment cost types'. The table below lists the defined shipment cost types.

| ShpCostTyp | Description |
|------------|---------------------|
| 0T04 | Outbound Truck - 4 |
| 0T05 | Outbound Truck - 5 |
| 0T06 | Outbound Truck - 6 |
| 0T07 | Outbound Truck - 7 |
| 0T08 | Outbound Truck - 8 |
| 0T09 | Outbound Truck - 9 |
| 0T10 | Outbound Truck - 10 |

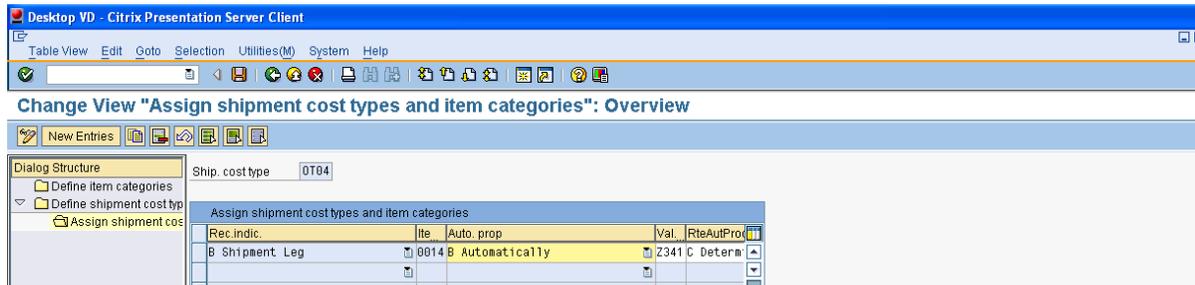
Define Item Categories



Item Category Detail Screen



Assignment of item category to shipment cost type



Define shipment cost relevance for shipment type and also shipment cost type to shipment type

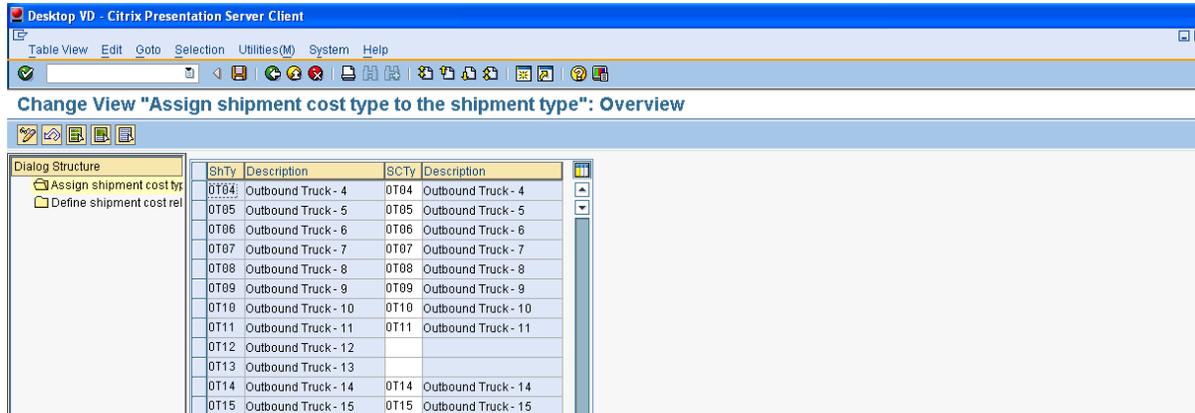
In this step we assign the shipment cost type to shipment type and also select whether the shipment cost has to be calculated at shipment header level, leg level, Loading Transfer Point or at Border Cross Point level.

Here we set as shipment cost calculation at leg level see Shipment Type OT04

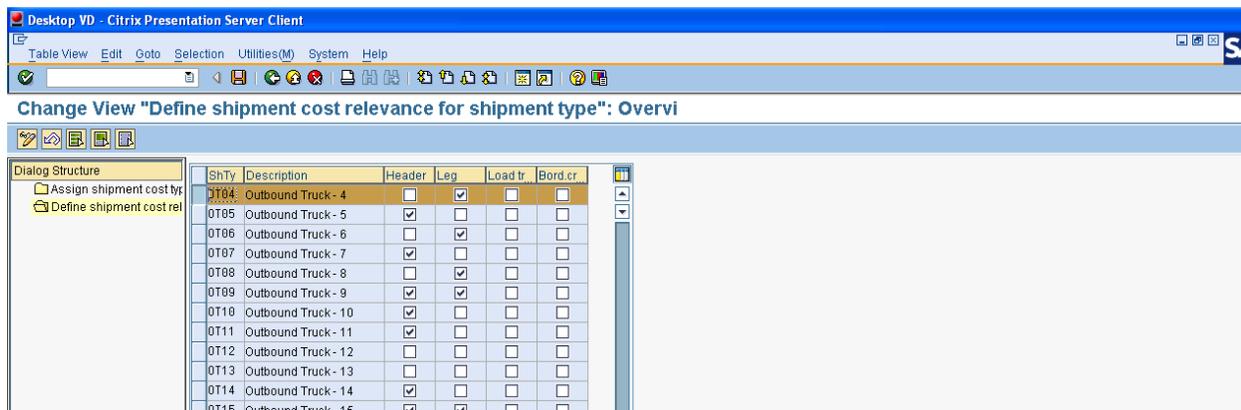
Configuration Path

SPRO → Logistics Execution → Transportation → Shipment Costs → Shipment Cost Document → Shipment Cost Relevance and default shipment cost type

Assignment of shipment type with shipment cost type



Define shipment cost relevance for shipment type



Define Condition Types

In this model we need to calculate three different transportation cost for different vendors

Vendor A has to be paid based on Weight/ Distance

Vendor B has to be paid based on Pallet/Distance

Vendor C has to be paid based on container

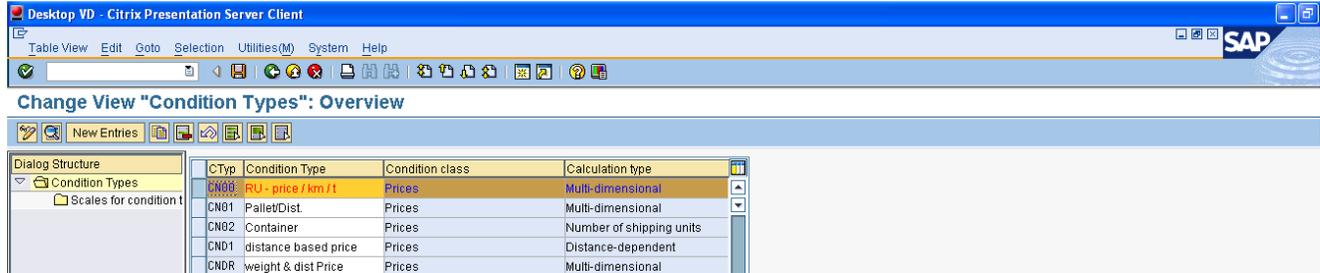
To calculate the freight cost based on weight/distance and Pallet/Distance we need to create a multi dimensional condition type which maintains the condition record at 2 dimensional based on weight / distance and also on Pallet / Distance.

After creating the multi dimensional condition type we also need to define the scales for condition type.

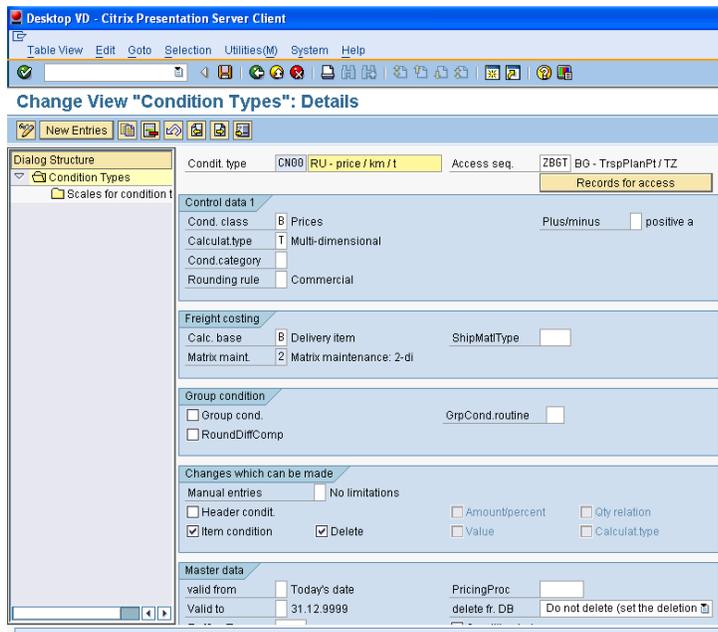
Configuration Path

SPRO → Logistics Execution → Transportation → Shipment Costs → Pricing → Pricing Control → Define Condition Type

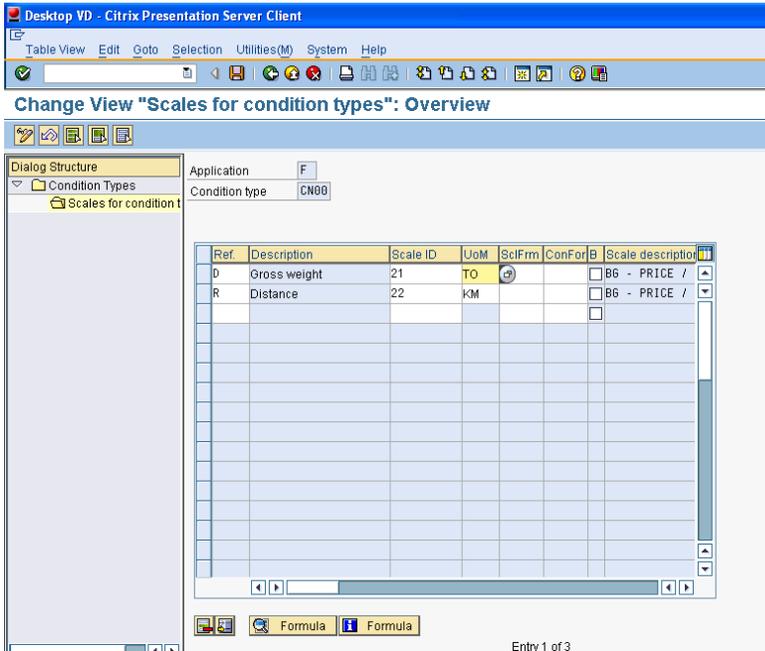
Vendor A Condition Refer CN00 Condition Type based on Weight / Distance



Details of Condition Type CN00 : While Defining this condition type assign the Freight Costing Calculation Base as “B” Delivery Item to pick up the weight from delivery.

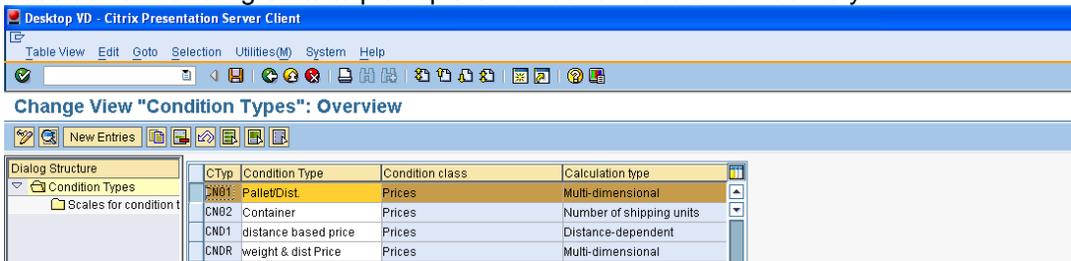


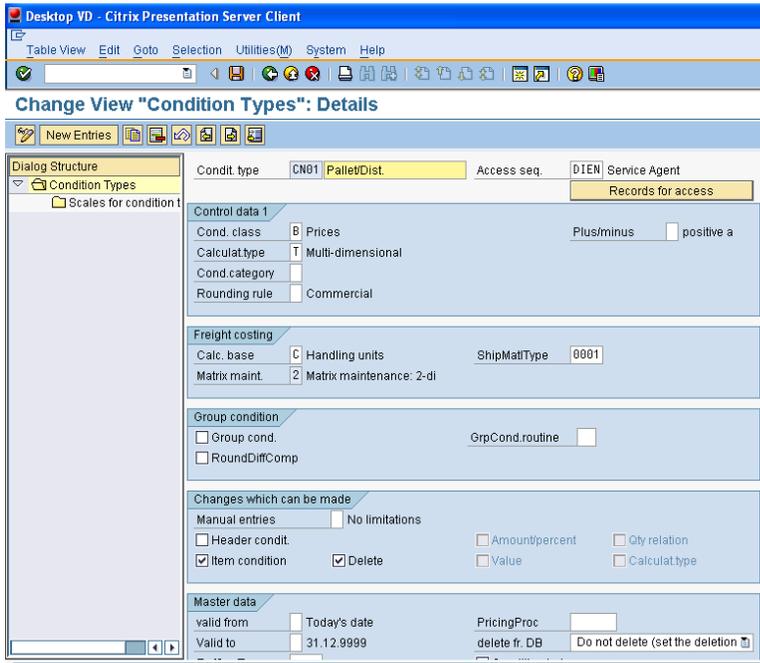
Defining scales for condition type CN00 : In below example scales are defined as gross weight and unit of measurement is given as Tonnes and distance the unit of measurement is given as Kilometer. We can change this UOM based on our business requirement.



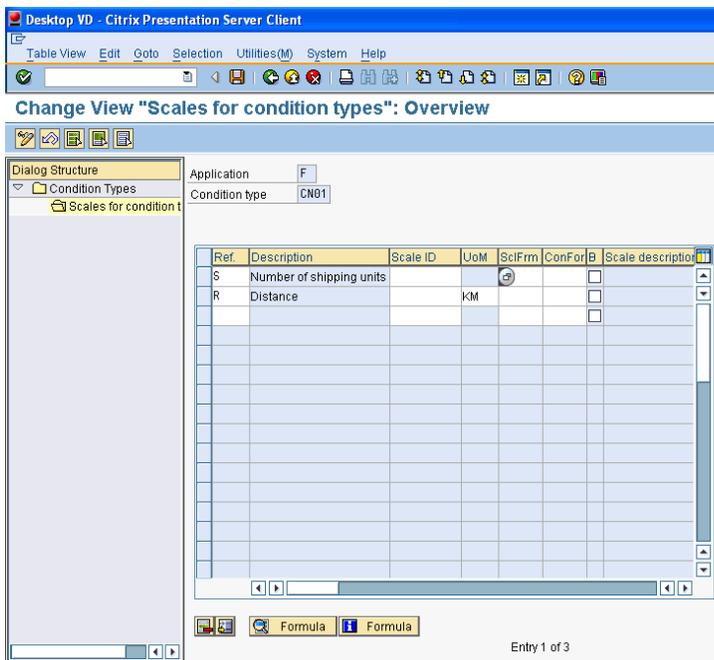
Vendor B Condition Refer CN01 Condition Type based on Pallet / Distance

Details of Condition Type CN01: While Defining this condition type assign the Freight Costing Calculation Base as "C" Handling Units to pick up the number of Pallets from delivery.





Defining scales for condition type CN01: In below example scales are defined as number of shipping units and distance the unit of measurement is given as Kilometer. We can change this UOM based on our business requirement.



Vendor C Condition Refer CN02 Condition Type based on Container
This is a normal freight condition which will be calculated based on the number of containers.



Details of Condition Type CN02 : In this assign calculation type as "S" Number of shipping units and freight costing calculation base as "C" Handling Units

The screenshot shows the SAP 'Change View Condition Types: Details' dialog box for condition type CN02. The dialog is titled 'Desktop VD - Citrix Presentation Server Client' and has a menu bar with 'Table View', 'Edit', 'Goto', 'Selection', 'Utilities(M)', 'System', and 'Help'. Below the menu bar is a toolbar with various icons. The main area is divided into several sections:

- Dialog Structure:** A tree view on the left shows 'Condition Types' and 'Scales for condition t'.
- Condit. type:** 'CN02 Container'. 'Access seq.' is 'VSEL Handling unit'. 'Records for access' is a button.
- Control data 1:** 'Cond. class' is 'B Prices'. 'Calculat.type' is 'S Number of shipping units'. 'Plus/minus' is 'positive a'. 'Cond. category' is empty. 'Rounding rule' is 'Commercial'.
- Freight costing:** 'Calc. base' is 'C Handling units'. 'ShipMatType' is '0002'. 'Matrix maint.' is 'Standard maintenance'.
- Group condition:** 'Group cond.' is checked. 'RoundDiffComp' is checked. 'GrpCond.routine' is '1 Overall Document'.
- Changes which can be made:** 'Manual entries' is 'No limitations'. 'Header condit.' is unchecked. 'Item condition' is checked. 'Delete' is checked. 'Amount/percent' is checked. 'Value' is checked. 'Qty relation' is unchecked. 'Calculat.type' is unchecked.
- Master data:** 'valid from' is 'Today's date'. 'PricingProc' is empty. 'Valid to' is '31.12.9999'. 'delete fr. DB' is 'Do not delete (set the deletion)'. 'delete fr. DB' has a dropdown arrow.

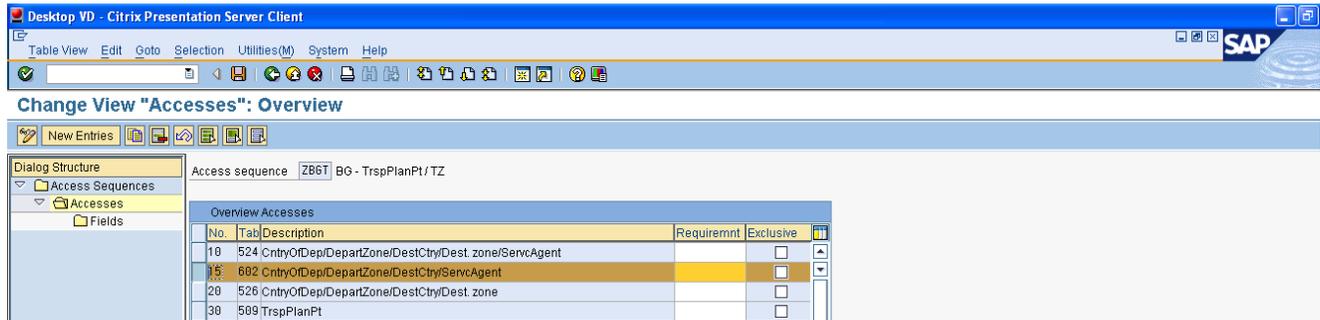
Define Access Sequence

Define the access sequence to condition types CN00, CN01 and CN02. In my example I have defined condition tables 602 for access sequence ZBGT which is assigned to condition type CN00.

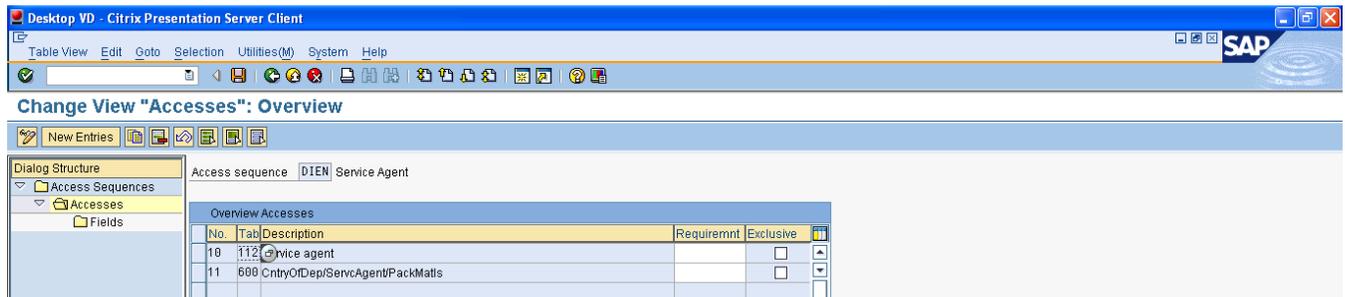
Configuration Path

SPRO → Logistics Execution → Transportation → Shipment Costs → Pricing → Pricing Control → Define Access sequence.

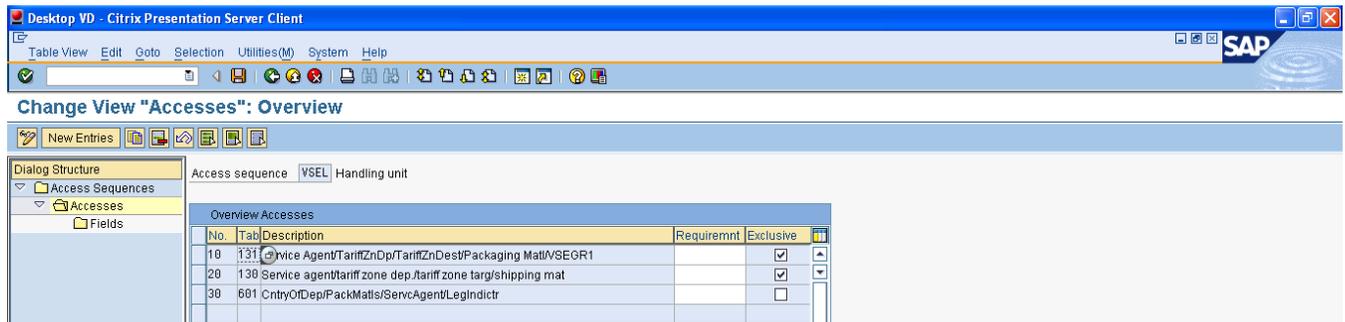
Access Sequence for CN00



For condition type CN01 I have assigned the existing DIEN with condition table 600



For condition type CN02 I have defined the existing VSEL with condition table 601



Define and Assign Pricing Procedures

In the pricing procedure you determine which condition types are taken into account and in which order. During pricing, the SAP System automatically determines the pricing procedure valid for a transaction and considers the condition types it contains one after the other.

Pricing procedure determination is carried out for each transportation planning point.

Define 3 different pricing procedures as below

Pricing Procedure

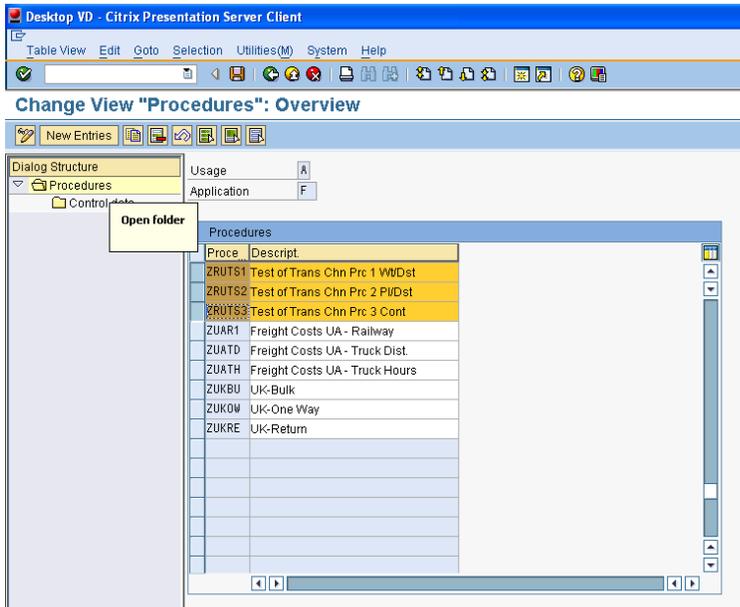
VENDOR A → To calculate the freight cost for Vendor A pricing procedure defined as ZRUTS1. Calculation based on Weight and Distance

VENDOR B → To calculate the freight cost for Vendor B pricing procedure defined as ZRUTS2. Calculation based on number of Pallets and Distance.

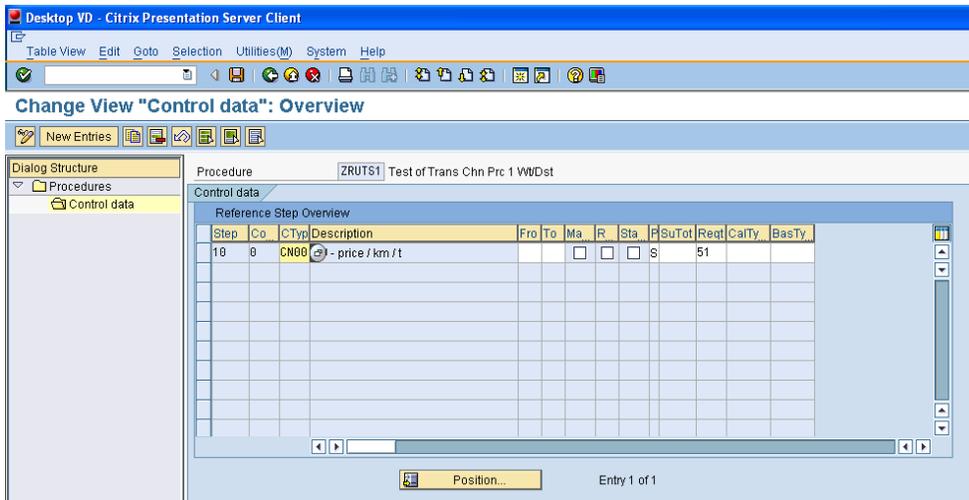
VENDOR C → To calculate the freight cost for Vendor C pricing procedure defined as ZRUTS3. Calculation based on Number of Containers.

Configuration Path

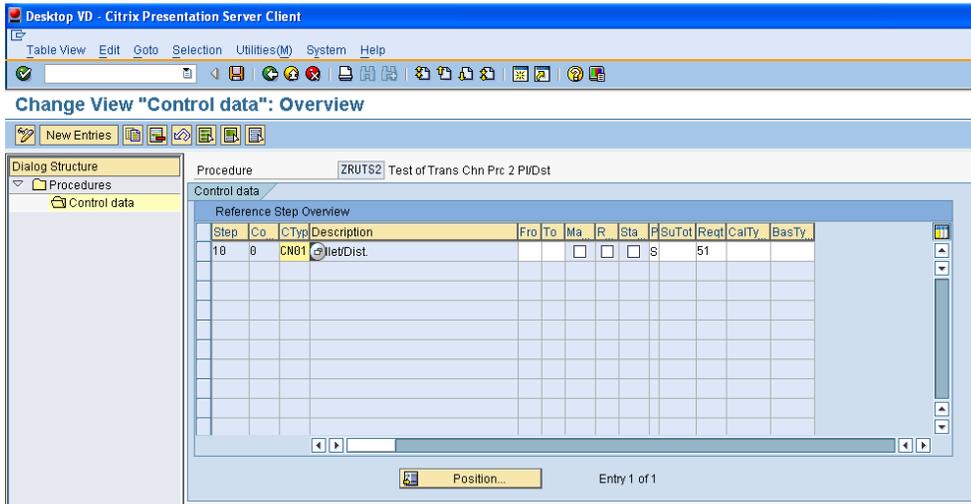
SPRO → Logistics Execution → Transportation → Shipment Costs → Pricing → Pricing Control → Define and Assign Pricing Procedures.



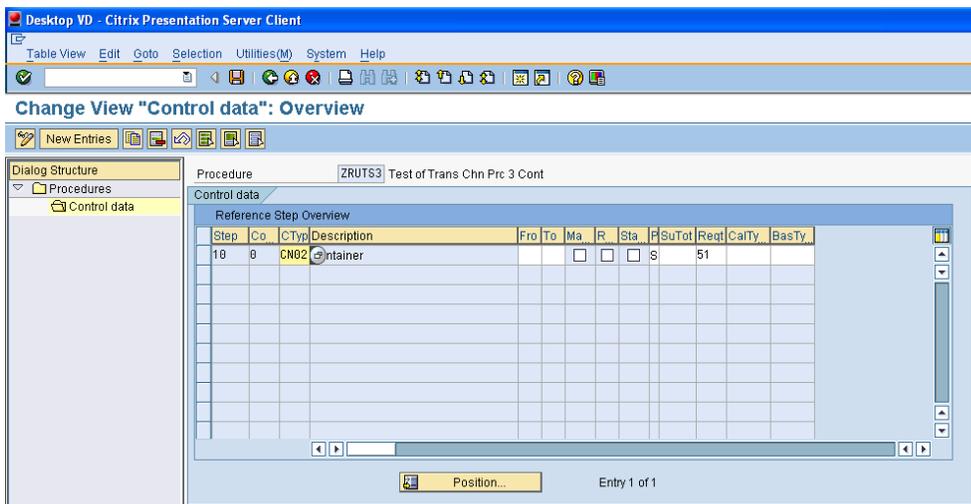
After defining the pricing procedure assign the condition type to the pricing procedure in my example I have assigned CN00 condition type to Pricing Procedure ZRUTS1.



CN01 condition type assigned to pricing procedure ZRUTS2



CN02 condition type assigned to pricing procedure ZRUTS3



Define Assignment of purchasing data for shipment costs for Shipping type

For settlement, you must assign the organizational units in the shipment to the relevant organizational units in purchasing.

These settings are necessary for creating accruals. The accruals are posted using service entry sheets. The purchasing organizational units are needed for service procurement.

Purchasing data needs to be defined based on Transportation Planning Point and Shipment Cost type.

Configuration Path

SPRO → Logistics Execution → Transportation → Shipment Costs → Settlement → Assign Purchasing Data.

Below is the necessary master data

- 1) Create packaging material with item category VERP for Pallets & Container and maintain the stock for this materials

Related Content

For more information, visit the [Enterprise Resource Planning homepage](#)

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