



Pushing Inventory Through the Supply Chain: How to Use APO Supply Distribution to Improve Stock Delivery

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Editor's Note: Does the reduction of storage costs and the increase of delivery speed to the end customer sound good to you? If so, then APO's Supply Distribution functionality might be just the ticket. In this screen-by-screen white paper, APO consultant Shaun Snapp explains how the Supply Distribution functionality can help SAP® users, and he reviews the basics of how to configure it. To help us understand how to use this tool, Shaun describes the difference between inbound and outbound quotas, and he shows how outbound quotas can be set up so that Supply Distribution can be used to improve product delivery. He also tells us how Supply Distribution fits in with other APO tools, such as CTM, that SAP customers may already be using for managing quotas and stock shipments. Finally, Shaun wraps up the article with a handy section on resolving conflicts between the CTM and Supply Distribution components—conflicts Shaun has seen and resolved on his own APO project assignments.

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Supply Distribution Requirement

What Is Supply Distribution?

Supply Distribution is a push-based stock-movement functionality within the Multilevel Supply Demand Matching area of APO.

Benefits of APO Supply Distribution

No-Demand Stock Move

Properly configured, Supply Distribution allows you to effectively move stock between facilities in an automated fashion without requiring a demand signal.

Reduce Storage Costs

Once a production run has been completed in a factory, many companies that do not have co-located factories and warehouses will generally want to move the stock from the factory as soon as possible (or as soon as feasible from a transportation perspective). The reasoning behind this: demand should be satisfied from the warehouse. Moving the finished good to the warehouse moves the product out of higher cost storage (the factory) to the lower cost storage center (the warehouse). Supply Distribution accomplishes this task automatically. Two things are required in order to allow Supply Distribution to perform its task: a setup quota between the locations and a Supply Distribution run.



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Speed of Delivery to End Customer

By using Supply Chain Distribution to allow early positioning of stock closer to the final point of delivery, forward stock movement reduces the transit time to the customer. The fact that Supply Distribution will do this automatically, and as soon as the excess inventory becomes available, means that planners will not have to rely on alerts or manual intervention to move the stock in a timely fashion.

Scope of Article

There are two different ways of moving material with quotas. You can use inbound, which works in conjunction with the Capable to Match function (CTM) or outbound, which will only work with Supply Distribution. CTM is in the Multi-Level Supply & Demand Matching area of Supply Network Planning (SNP). The CTM engine performs a check of production and transportation capacities. Supply Distribution could be run on its own, but in most cases it will be running in conjunction with either the SNP Optimizer, SNP Heuristics, or in this case the SNP CTM.

In this article, I'll begin by covering the basics of CTM. Then, I'll explain how to utilize Supply Distribution, first by illustrating how to set up outbound quotas, and then by running Supply Distribution. Finally, I'll close with a troubleshooting section on managing the conflicts between CTM and Supply Distribution when both are being utilized.

Overview of CTM and Inbound Quotas

Inbounds Quotas

In order for CTM to make sense of an inbound quota, it must have multiple options to choose from in a supply chain. Unlike Supply Distribution, a multi-node (at a single echelon level) network is necessary for CTM quotas to work properly. Figure 1 illustrates the inbound supply chain process.

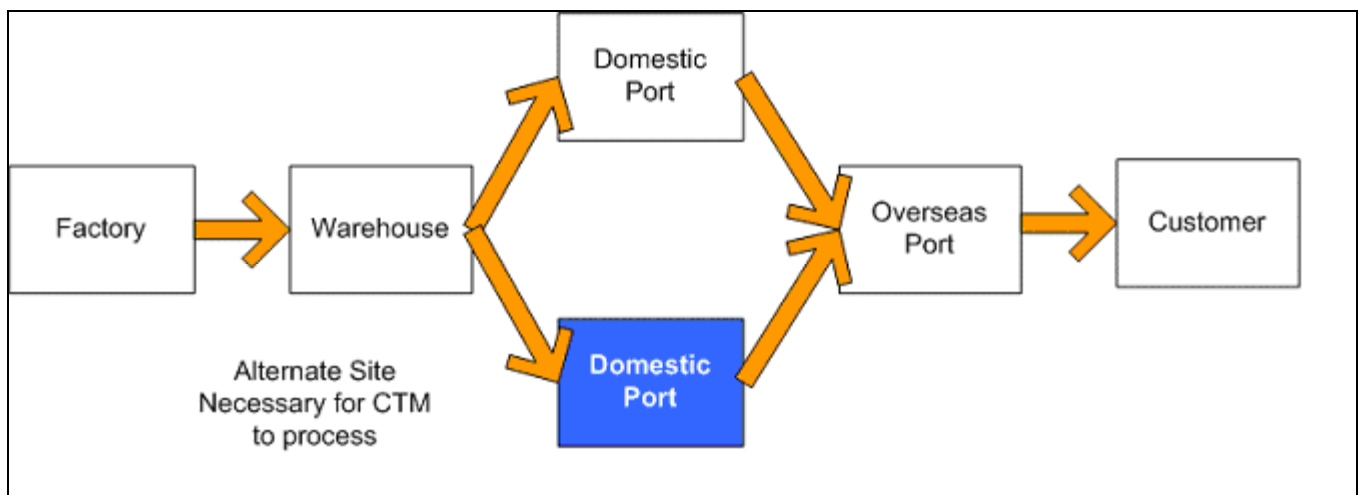


Figure 1: The Supply Chain for the Inbound CTM Process

In the example in Figure 1 above, the demand placed from the customer must go through either Domestic Port 1 or Domestic Port 2. The movement logic for the inbound quota is if the inbound quota is set to "1" from the warehouse to Domestic Port 1, and to "2" on Domestic Port 2; and if



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three separate demands are placed on C720, CTM will bring one order through Domestic Port 1 and the two orders through Port 2.

There is some confusion on this issue. Many SAP consultants think that Inbound Quotas work based on percentages, i.e., that CTM would move 33% of the volume of the three orders through Port 1 and 66% through Port 2. This may have been the case in previous version of APO, but presently, the method used is the one I've described above.

Inbound Quotas contain a significant amount of complexity when compared to using Outbound Quotas (with Supply Distribution). Also, in general, Inbound Quotas do not work as cleanly as the quota arrangements for Supply Distribution because of this added complexity. If you decide to use CTM quotas, allocate some extra time for troubleshooting.

Outbound Quotas and Supply Distribution

Outbound Quotas are much more flexible in that:

1. They do not require a demand signal in order to move stock. This means they are perfect for “cleaning out” excess inventory kept at a factory.
2. They do not require that various demand signals be split across two or more locations (a requirement for CTM Inbound Quotas) in order to work properly.

Figure 2 shows how Outbound Quotas can work with a very simple network.

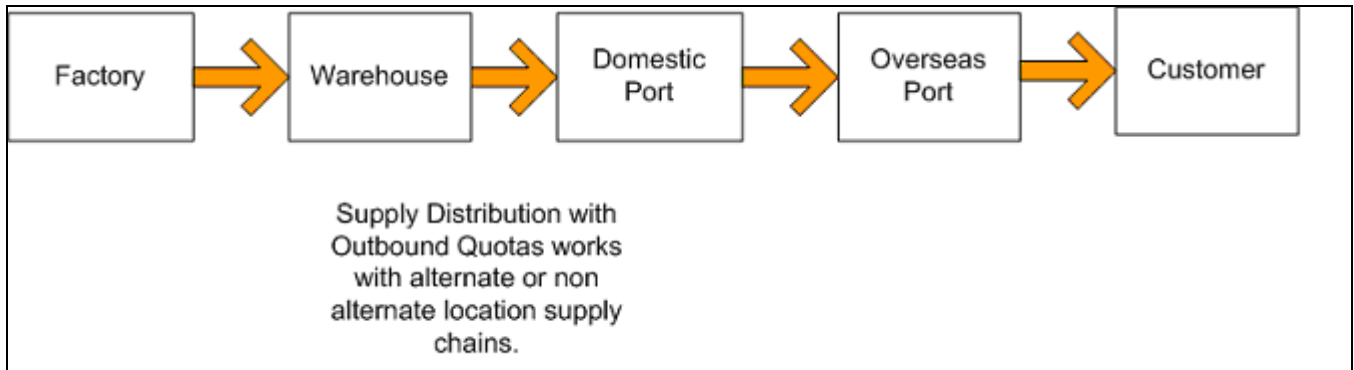


Figure 2: How Outbound Quotas Work in a Very Simple Network

Note: The process flow in Figure 2 is used to draw a comparison between how CTM and Supply Distribution deal with quotas. However, in most cases you will not use quotas to move finished goods all the way to the customer, only to locations that are designed to hold inventory.



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Using Supply Distribution, Part One: Setting Up Outbound Quotas

Setting Up Quotas

The first step in the process of enabling Supply Distribution is setting up the quota, which is located under APO master data and transaction /SAPAPO/SAPLOO_TR_QSALONE. (See Figure 3.)

Quota Arrangement	
Model	000
Location	<input checked="" type="checkbox"/>

Version	
<input checked="" type="radio"/> Version independent	
<input type="radio"/> Version	000

Quota direction	
<input type="radio"/> Inbound quotations	
<input checked="" type="radio"/> Outbound quotations	

Figure 3: Location of Outbound Quotations Setting

In the initial screen (Figure 3), you select your model number and location. Since this quota will be outbound, you will want to enter the “from” location. Quotas can be set as version independent, or version dependent. Choose which level of restriction you would like, and then move to the initial quota input screen. And of course don’t forget to select the right type of quota. (See Figure 4.)

Product	Start date	End date	Req. split	SplitQty	Unit
023-9770-007153	22.10.2003	04.04.2007	<input type="checkbox"/>		

Figure 4: Initial Quota Input Screen



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Figure 5 below shows the initial entry for all quotas applied to a particular product between two locations. Multiple Quota Arrangements can be set up per product.

Quota Arrangement Header

✓ [Icons] ✕

Product selection
023-9770-007153

Validity period
Start date: 22.10.2003
End date: 04.04.2007

Parameters
 Allow rqmts splitting
Rqmts grouping: []
Min. split quantity: []

Figure 5: Quota Arrangement Header

The setup screen in Figure 5 can be a bit confusing to a first-time user. By creating a new line item per product, you have only set up the quota “placeholder.” In order to complete the quota, you must double-click the product line item that will open up the following box below it. *Unless you open this screen, no quota will be created.* (See Figure 6.)

Quota arrangement items

Quota arrangmts items For product 023-9770-007153

Type	Location	SupplSourc	Quota arr.	Heuristic	Alloc. qty	Quota base	Unit
LOK	S17		1.00				

Figure 6: Quota Arrangement Items Screen for Entering Multiple Quotas

Now you can enter multiple quotas per product. *Never enter multiple product line items in order to create multiple quotas.* Always enter multiple quotas per product in the Quota Arrangement Items screen listed above in Figure 6.



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Note: the Quota Arrangement Items screen will not show the data input screen unless you click the “Create a New Line Item” button in the upper left-hand corner. Once you do, the control screen in Figure 7 will appear.

Quota Arrangement Item	
✓ ↻ ✕	
Quota Arrangement for Location	
Location	S17
Parameters	
Quota arr.	1.00
Heuristic	
Quota base	
Alloc. qty.	0.000
Unit	

Figure 7: Quota Arrangement Quantity Screen

This screen in Figure 7 is where you enter the Quota Arrangement quantity and the destination location. Because the Inbound Quota works in a binary fashion, it does not matter much what you place in the quota arrangement value box. Whether you enter 1 or 1000 (units), it will still move whatever is available in present or future stock to the destination.



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Figure 8 shows the entire quota screen for your reference.

Quota arrangements: Create

Total quota arrangements

Quota arrangement maintenance

Model: 000
Location: F17
Direction: 1 Inbound
Version: Default

Quota Arrangement item

Quota Arrangement for Location
Location: S17

Parameters

Quota arr.: 1.00
Heuristic:
Quota base:

Alloc. qty.: 8,800
Unit:

Quota Arrangements

Product	Start date	End date	Req. grpg	Req. split	SplitQty	Unit
023-9770-007153	07.11.2003	04.04.2007				

Quota arrangement items

Quota arrangements items For product 023-9770-007153

Type	Location	SupplSource	Quota arr.	Heuristic	Alloc. qty	Quota base	Unit
LOK	S17		1.00				

Figure 8: Entire Quota Arrangement Screen

After having entered a Quota Arrangement and Location, click the green arrow and you will have created your first quota. Because the Quota Arrangements are stagnant, and you must create a quota for every product for which you want the quota movement, the setup of quotas is best handled through master data uploads. This topic will be covered further in the maintenance section of this article.



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Using Supply Distribution Part Two: Running Supply Distribution

Running Supply Distribution

Once quotas have been set up to your liking, all that remains is to run Supply Distribution. Go to transaction /SAPAPO/CTMSUPPLYDISTRIBUTE, choose all product/locations, or create and use a variant and run the program.

Tip: as a rule, Supply Distribution runs significantly more quickly when run in the background. Also, as with CTM, the majority of runtime is spent uploading data such as the transport lanes, etc. Therefore, adding more product/locations does not appreciably increase the run time. However, running a small dataset in the foreground will give the misimpression that Supply Distribution is slow. But when Supply Distribution is run in the background, even for very large networks with many products, Supply Distribution should run in minutes. The screen shot below (Figure 9) shows how we run Supply Distribution.

Supply Distribution

Product and location selection for supply distribution

Planning Version 000

Products to

Locations to

All Products/Locations

Period

Start Date 01.10.2003 Time 00:00:00

End Date 31.12.2007 Time 00:00:00

Technical Settings

Create fixed pegging

PP/DS Orders

SNP Orders

CTM Reference Profile

Figure 9: Supply Distribution Run Screen

Before we go further into our scenario, we need to define the following:

1. The portion of the network we want Supply Distribution to consider. When testing Supply Distribution, you can specify just the portion of the overall network you are testing. If you intend to run the Supply Distribution for the entire network, simply select All Products/Locations



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2. The duration for which we want to run Supply Distribution (the start date and end date). The timing will more than likely correspond with your CTM profile Time Stream (that is, the planning fence you intend the planning system to look for.) This can be found in the Planning Scope tab of your CTM profile as listed below in Figure 10.

CTM - Capable-To-Match

Supply Chain Viewer | Product view | DS Planning Board | SNP Plannir

CTM planning profile: TEST | Test CTM Test Strategy

Planning run | Planning scope | Strategies | Aggregation | Dema...

Scheduling Data

Version	000	000 - ACTIVE VERSION
Model	000	000 - Active model

Master Data Selection

All Master Data in Model
 Selected Master Data for Model

Demand Selection

All Demands in Version
 Order Selection

Supply Selection

All Stock in Version
 Order Selection

Planning Period

Time Stream	CTM05	36 Month Calendar for deletion Mth-1
Planning Begin	01.11.2003	00:00:00
Planning End	31.10.2006	23:59:59
Interval Planning		

Figure 10: CTM Planning Profile

Finally, you can set Supply Distribution to create either PP/DS or SNP orders. (See Figure 11.)

Technical Settings

Create fixed pegging

PP/DS Orders
 SNP Orders

Figure 11: Supply Distribution Run Screen

As with CTM, using either of these order scenarios will depend upon the configuration of your PPMs and whether they have been set up as PP/DS PPMs or SNP PPMs. However, our objective here is to “clean out” pre-existing planned inventory from the location. Thus, our test is to move stock, not create new orders.



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Results

Results can be checked by looking at the CTM Message Log, which is brought up automatically after every Supply Distribution run. (See Figure 12.)

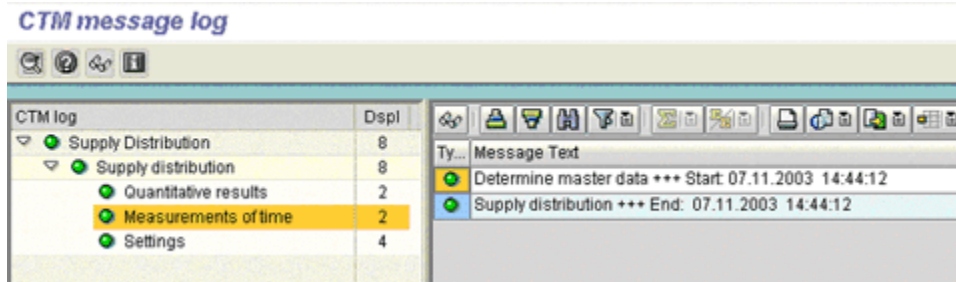


Figure 12: CTM Message Log

The Supply Distribution message log in Figure 12 will be familiar to CTM users. It is the same log and shows the similar classifications of “Quantitative Results,” “Measurements of Time,” and “Settings.” This report is good for viewing errors,

However, this report tends to give similar types of statements regardless of the results. For this reason, it’s recommended to simply look at the stock situation at the product location. To do this, see transaction /SAPAPO/SAPLRRP_FRAMES.

Figure 13 shows the product view where we can see a future stock from planned orders of 100,000 and 15,000 units.

Rqts/avail...	Receipt/reqmt. elemnt	Category description	Rec./issue qty/Reque...	Surplus/sho...	C...	U...
08.03.2004	25310712	Planned order (manual, firm...	100,000	100,000		K6
28.05.2004	25310713	Planned order (manual, firm...	15,000	15,000		K6
23.07.2006	End of production horizon					

Figure 13: Stock Product View

We must have stock at the facility in order for Supply Distribution to do its work. The results after running Supply Distribution are shown below. (See Figure 14.)

Rqts/avail...	Receipt/reqmt. elemnt	Category description	Rec./issue qty/Reque...	Surplus/sho...	C...	U...
08.03.2004	25310712	Planned order (manual, firm...	100,000	0		K6
08.03.2004	25310714/1/1	Outward Stock Movement	100,000-	0		K6
28.05.2004	25310713	Planned order (manual, firm...	15,000	0		K6
28.05.2004	25310715/1/1	Outward Stock Movement	15,000-	0		K6
23.07.2006	End of production horizon					

Figure 14: Results After Running Supply Distribution



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As shown in Figure 14, Supply Distribution scheduled two stock movements out of the factory as soon as possible—which means as soon as the stock became available. So, by looking at the product view, we can see if Supply Distribution has been effective. We now have the planned inventory moved out of the factory and closer to the end customer. The ultimate strength of this feature, of course, is running it automatically for a large set of locations.

Resolving CTM and Supply Distribution Conflicts

Conflicts between Supply Distribution and CTM for Quotas:

As discussed, inbound and outbound quotas work somewhat differently from one another. While inbound and outbound quotas do not conflict with one another, depending upon how you run CTM, it can interfere with the Supply Distribution Outbound Quotas. Supply Distribution moves stock based on a quota only, while CTM requires the combination of a demand and a quota. Therefore, if CTM is run after a Supply Distribution run, CTM will reverse Supply Distribution's quota moves.

How to Mitigate any Supply Distribution Quota Reversal by CTM

To prevent CTM quota reversal, you are provided with two options.

1. Run CTM in “Do not Replan Orders” Mode. If CTM is set to “Do not Replan Orders” then CTM will not touch the stock moves on the basis of the previous Supply Distribution run. (However, many clients will be averse to being unable to plan previous orders.)
2. Run Supply Distribution after every CTM run.

Due to Supply Distribution's fast runtime, you are provided with a great deal of flexibility and should be able to run Supply Distribution anytime you run CTM—even if that is daily.

Maintenance

The main work in maintaining Supply Distribution is keeping the quotas up to date. Anytime a new product is added (if you are deciding on having the product work as part of Supply Distribution), a new Outbound Quota must be set up. The same applies for any new quota locations that are added to the network. This sounds relatively simple, but is not.

Firstly, there is no BAPI for quotas in APO 3.1. Therefore this will need to be written by a member of the project team or by SAP.

Secondly, a selection tool must be coded in order to pull the net change of new locations and especially new products from the SAP database. For instance, you do not want to set up a quota for all products at a factory, because all products could end up being raw materials or WIP (Work in Process - any unfinished product).

Depending upon your individual client vagaries, your selection logic may need to be similarly sophisticated to set up quotas for only the right products.



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Conclusion

Supply Distribution is an effective and fast way to reposition stock. While the quotas used in Supply Distribution are not as sophisticated as those used with CTM, they are simple to understand and more easily implemented. If you have stock that is not adequately picked up and moved through the supply chain on the basis of demand signals, Supply Distribution Outbound Quotas will provide a very reliable tool for you.

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