

Route based Operations in a Warehouse without OTM

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Abstract

The basic goal of any warehouse is to fulfill customer orders. The manner in which the orders are fulfilled can offer a warehouse competitive advantages over competitors. Unfortunately for the warehouse manager the customer locations are spread across geographies or in the case of small countries across cities.

It becomes all the more important to minimize transportation costs when delivering to customers. Transportation Management offers a variety of route planning capabilities but for some operations that just need lightweight route based activities can be an overkill.

WMS in conjunction with Order Management and Shipping Execution can meet the above requirements efficiently and without having to license additional products.

Solution Approach

- The routes correspond to destination zones.
- Shipping Methods correspond to Routes.
- Sales order lines have Shipping method reference.
- Each zone is modeled as a Staging lane in the Warehouse.
- Putaway rules in the warehouse direct the picked material to appropriate staging lanes (Routes).
- Routes are prioritized for picking so higher priority routes are picked first.
- Material segregation happens while dropping the Orders that are picked.
- Shipping by Routes.

Target Industry, Customer profile & Regions

Distribution warehouses serving a specific geography such as small counties, Cities, States and even Countries.

Live Customers

Y.K.Almoayyed and Sons

Key Contacts for the Solution

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Solution Design

A. Prerequisite setups:

Route definition: Carriers modeled as routes.

Carriers

Name Short Name Active

SCAC Code Default Currency Generic

Services | Addresses/Sites | Contacts | Classification | Vehicle Types | Rating, Payment | Mode Limits

Service Level	Mode	Ship Method
Ground	LTL	MANAMA-LTL-Ground

Define Service Levels | Organization Assignments | Details

Solution Design

A. Prerequisite setups:

Assign route to organization



Solution Design

A. Prerequisite setups:

Pick Release rules:

Define Pick slip grouping rules to group sales orders by route: Group by Carrier and Delivery.

Also use Destination Subinventory and Locator

Pick Slip Grouping Rules

Pick Methodology: User Defined

Rule Name: YKA Route Grouping rule

Description: YKA Route Grouping rule

Effective: 04-APR-2012

Group By

- Sales Order**
 - Order Number
 - Customer
 - Ship To
 - Carrier
 - Trip Stop
 - Delivery
 - Shipment Priority
- Common**
 - Source Subinv
 - Source Locator
 - Item
 - Revision
 - Destination Subinv
 - Destination Locator
 - Project
 - Task
- Manufacturing**
 - Job / Schedule
 - Operation
 - Department
 - Push / Pull

Perform Bulk Picking: No

Solution Design

A. Prerequisite setups:

Define Release sequence rule

The screenshot shows a window titled "Release Sequence Rules" with the following fields and options:

- Rule: YKA Release sequence
- Description: [Empty text box]
- Effective Dates: 04-APR-2012 - [Empty text box]

Below these fields is a section titled "Release Priority" containing a table with columns for "Priority", "Ascending", and "Descending".

	Priority	Ascending	Descending
Order	2	<input checked="" type="radio"/>	<input type="radio"/>
Outstanding Invoice Value	[Empty text box]	<input type="radio"/>	<input type="radio"/>
Schedule Date	1	<input checked="" type="radio"/>	<input type="radio"/>
Departure Date	[Empty text box]	<input type="radio"/>	<input type="radio"/>
Shipment Priority	[Empty text box]	<input type="radio"/>	<input type="radio"/>

Solution Design

A. Prerequisite setups:

Release rules by route: In order to pick release orders/lines by route and group the Tasks.

The screenshot shows a software window titled "Release Rules". At the top, there is a "Rule" field containing "021 MANAMA" and an "Effective" date field containing "04-APR-2012". Below this is a "Release Criteria" section with three tabs: "Order", "Shipping", and "Inventory". The "Order" tab is selected. Under the "Order" tab, there are several input fields: "Orders" (a dropdown menu set to "Unreleased"), "Order Number" (a text box), "Destination Type" (a dropdown menu set to "Ship-To Location"), and "Customer" (a text box). To the right of these are "Order Type" (a text box), "Ship Set" (a checkbox), and "Ship-To" (a text box). Below the "Order" tab is an "Item" section with "Category Set" (a text box), "Number" (a text box), and "Category" (a text box). At the bottom, there are two sections: "Scheduled Ship Dates" and "Requested Dates". Each section has a "Start Within" dropdown menu, a "Days" input field, and a "Time" input field. In the "Scheduled Ship Dates" section, the "Days" field contains the number "1" and the "Time" field contains "00:00:00".

Solution Design

A. Prerequisite setups:

Set the ship method and set autocreate deliveries = Across orders if there is a need to consolidate orders for the same customer

The screenshot shows the 'Release Rules' configuration window. At the top, the 'Rule' is set to '021 MANAMA' and the 'Effective' date is '04-APR-2012'. Below this, the 'Release Criteria' section is active, with the 'Shipping' tab selected. The configuration includes the following fields:

Field	Value
Rule	021 MANAMA
Effective	04-APR-2012
Release Criteria	Shipping
Ship Method	MANAMA-LTL-Ground
Ship From	ELE Aker Warehouse :
Document Set	
Autocreate Deliveries	Yes
Auto Pick Confirm	No
Ship Confirm Rule	
Shipment Priority	
Include Assigned Lines	<input type="checkbox"/>
Release Sequence Rule	YKA Release sequence
Autocreate Delivery Criteria	Across Orders
Autopack Delivery	No
Append Deliveries	No

Solution Design

A. Prerequisite setups:

Set task priority so that the route is prioritized. All route based rules can be set with priorities

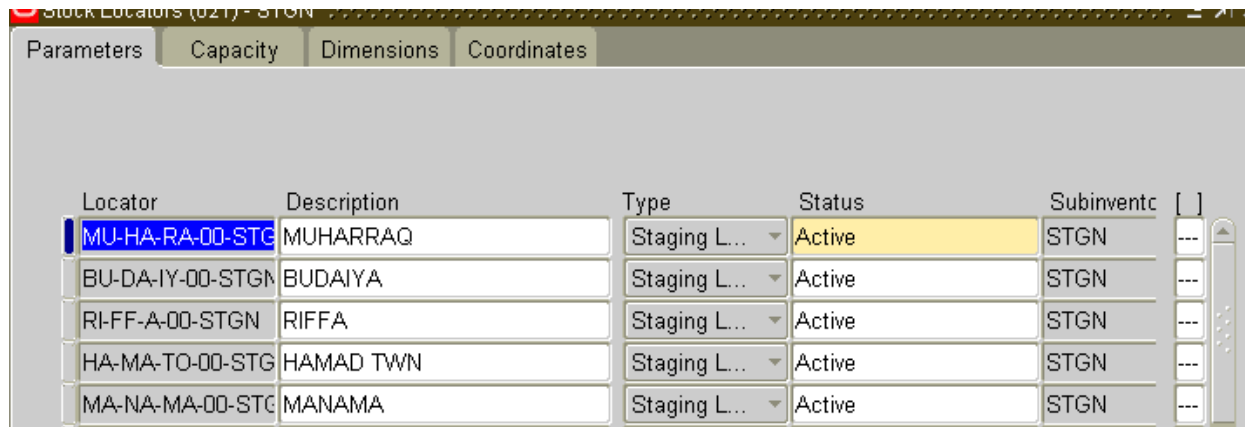
The screenshot shows the 'Release Rules' configuration window. At the top, the 'Rule' is set to '021 MANAMA' and the 'Effective' date is '04-APR-2012'. Below this, the 'Release Criteria' section is active, with the 'Inventory' tab selected. The 'Pick Slip Grouping Rule' is set to 'YKA Route Grouping rul'. The 'Warehouse' is '021', and the 'Allocation Method' is 'Inventory Only'. The 'Auto Allocate' is set to 'Yes', 'Plan Tasks' to 'No', and 'Task Priority' to '60'. The 'Pull Replenishment' is set to a default value. The 'Pick From' section shows 'Subinventory' and 'Locator' fields, and the 'Default Stage' section shows 'Subinventory' set to 'STGN' and 'Locator' as an empty field.

Field	Value
Rule	021 MANAMA
Effective	04-APR-2012
Release Criteria	Order, Shipping, Inventory
Pick Slip Grouping Rule	YKA Route Grouping rul
Warehouse	021
Subinventory	
Project	
Task	
Allocation Method	Inventory Only
Cross Dock Criteria	
Auto Allocate	Yes
Plan Tasks	No
Task Priority	60
Pull Replenishment	
Pick From Subinventory	
Pick From Locator	
Default Stage Subinventory	STGN
Default Stage Locator	

Solution Design

A. Prerequisite setups:

Staging lanes by route: Create staging lanes to mimic routes so that the Pick drop can happen into appropriate staging lanes. This helps segregate the picked material by route.



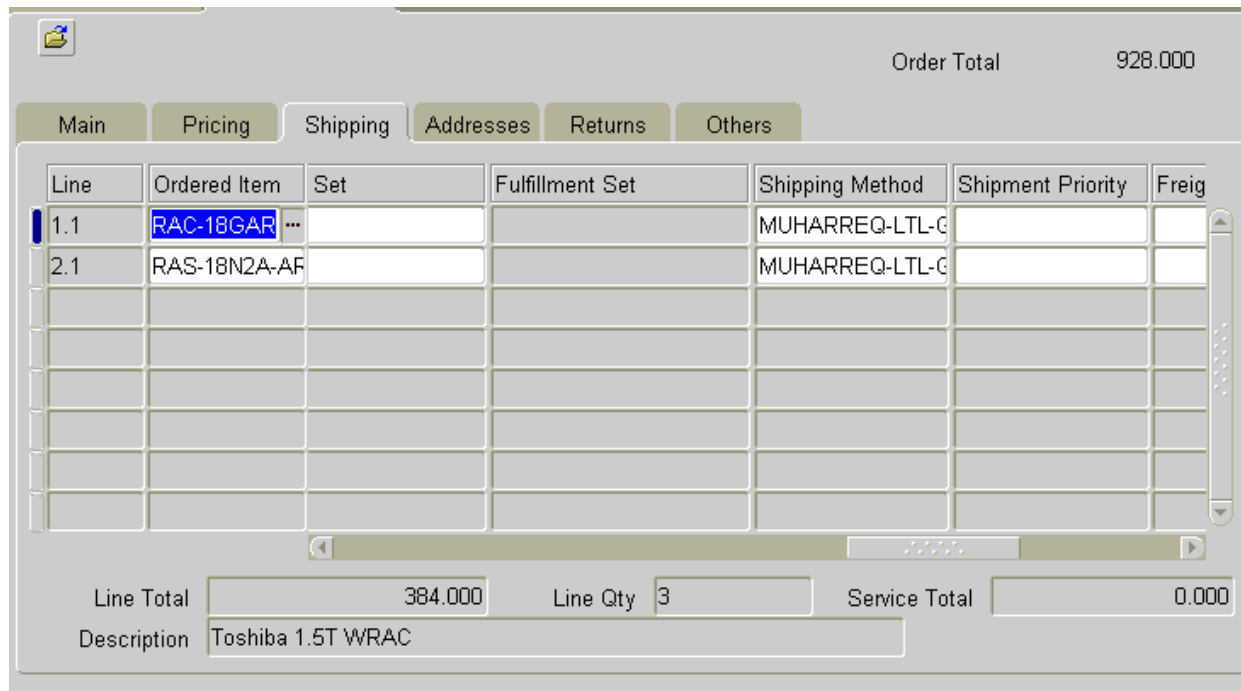
The screenshot shows the SAP Stock Locations (02) - STGN window. The window has tabs for Parameters, Capacity, Dimensions, and Coordinates. Below the tabs is a table with the following columns: Locator, Description, Type, Status, and Subinventc []. The table contains five rows of data, all with a Status of Active.

Locator	Description	Type	Status	Subinventc []
MU-HA-RA-00-STG	MUHARRAQ	Staging L...	Active	STGN
BU-DA-IY-00-STGN	BUDAIYA	Staging L...	Active	STGN
RI-FF-A-00-STGN	RIFFA	Staging L...	Active	STGN
HA-MA-TO-00-STG	HAMAD TWN	Staging L...	Active	STGN
MA-NA-MA-00-STG	MANAMA	Staging L...	Active	STGN

Solution Design

B. Order execution:

Order creation: Sales orders are created with shipping method specified on the order lines. Shipping method corresponds to a route.



Order Total 928.000

Main Pricing Shipping Addresses Returns Others

Line	Ordered Item	Set	Fulfillment Set	Shipping Method	Shipment Priority	Freig
1.1	RAC-18GAR ...			MUHARREQ-LTL-G		
2.1	RAS-18N2A-AF			MUHARREQ-LTL-G		

Line Total 384.000 Line Qty 3 Service Total 0.000

Description Toshiba 1.5T WRAC

Solution Design

B. Order execution:

Pick Release process

Pick Release SRS program can be Auto-scheduled to run All sales orders that were eligible for being released will be picked up for release.

Release rules for each route are created and scheduled..



The image shows a 'Parameters' dialog box with the following fields and values:

Field	Value
Release Rule Name	021 MUHARREQ
Batch Prefix	
Debug Level	0
Debugging	OFF
Actual Departure Date	10-APR-2012 08:52:19
Number of Child Processes	

Buttons: OK, Cancel, Clear, Help

Solution Design

B. Order execution:

Task creation: Tasks are created in the warehouse control board in pending status so they can be dispatched to eligible pickers upon sign on to the handhelds.

Note the Task priority and the destination staging locator. Staging lanes are named suitably to mimic routes.

Picks for routes with highest priority will happen first then for the tasks with the next highest priority and so forth. This ensures outbound trucks destined for the highest priority routes will leave the dock first.

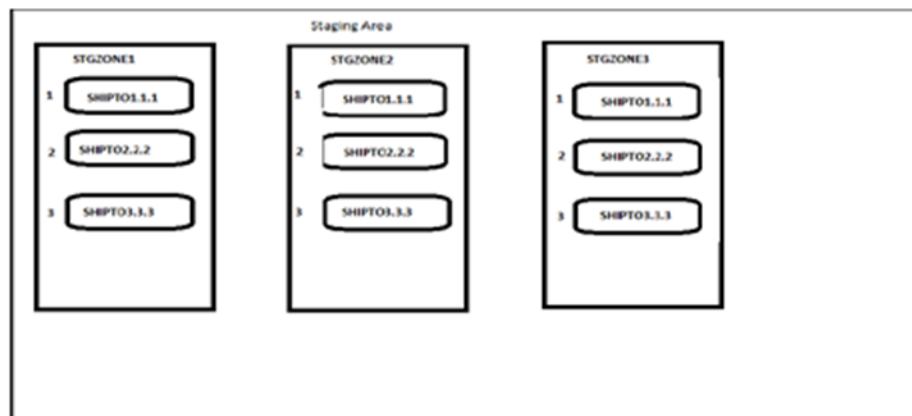
The screenshot displays two tables from a warehouse control board interface. The top table, titled 'Tasks (021)', lists individual tasks with columns for priority, status, transaction type, system task, source header, lot number, item, item description, subinventory, locator, destination subinventory, and destination locator. The bottom table, also titled 'Tasks (021)', shows delivery details for the tasks, including subinventory, locator, destination subinventory, destination locator, quantity, unit of measure, operation, user task, delivery number, ship method, carrier, and shipment date. Red boxes highlight specific data points in both tables.

Pl...	Status	Pri...	Transactio...	System Ta...	Source Header	Li...	Item	Item Descri...	Subinventory	Locator	To Subinve...	To Locator
Indep...	Pending	100	Sales order	Pick	12001101841	1.1	RAC-18GAR	Toshiba 1.5T ...	A1EHA	A1-04-02-B02-...	STGN	MU-HA-RA-00...
Indep...	Pending	100	Sales order	Pick	12001101841	2.1	RAS-18N2A-AR	1.5T Split-Out...	A2EHA	A2-12-17-B01-...	STGN	MU-HA-RA-00...
Indep...	Pending	60	Sales order	Pick	12001101842	1.1	RAC-18GAR	Toshiba 1.5T ...	A1EHA	A1-04-02-B02-...	STGN	MA-NA-MA-0...
Indep...	Pending	60	Sales order	Pick	12001101842	2.1	24PB1	24" LCD TV	A2EHA	A2-14-01-A02-...	STGN	MA-NA-MA-0...

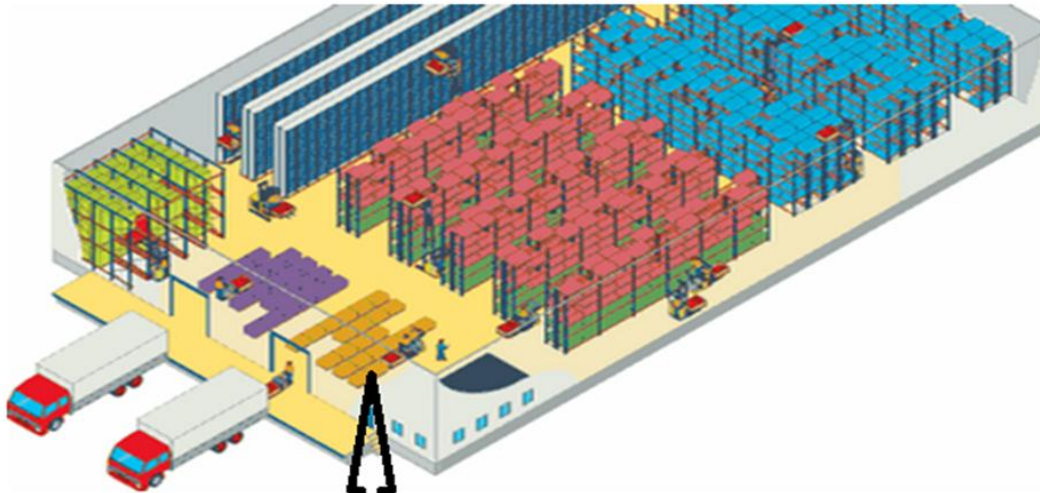
Subinventory	Locator	To Subinve...	To Locator	Q...	U...	Operation ...	User Task ...	Delivery	Ship Method	Carrier	Shipment ...
A1EHA	A1-04-02-B02-...	STGN	MU-HA-RA-00...	3	EA	LPN based co...	FPIK	206087	MUHARREQ-LTL-Gr...	MRQ	10-APR-2012
A2EHA	A2-12-17-B01-...	STGN	MU-HA-RA-00...	4	EA	LPN based co...	FPIK	206087	MUHARREQ-LTL-Gr...	MRQ	10-APR-2012
A1EHA	A1-04-02-B02-...	STGN	MA-NA-MA-0...	3	EA	LPN based co...	FPIK	206088	MANAMA-LTL-Ground	MANAMA	10-APR-2012
A2EHA	A2-14-01-A02-...	STGN	MA-NA-MA-0...	2	PCE	LPN based co...	FPIK	206088	MANAMA-LTL-Ground	MANAMA	10-APR-2012

Q&A

Load Sequencing



- STGZONE – Staging Subinventory corresponds to Zone/Route
- SHIPTO.1.1 – Staging Locator corresponds to Customer ShipTo.
- Layout of the boxes on the warehouse floor corresponds to the Load sequence
- 1,2,3 refer to loading sequence
- Putaway rules using SHIPTO and Shipping method code can direct picked material to appropriate Staging locators



Staging lane