## Content

1. **Business Scenario Descriptions.** ................................................................. 4
   1.1 Courier Express Parcel. ............................................................................ 4
   1.2 Domestic Outbound Transportation. ......................................................... 5
   1.3 Intermodal Rail Freight. ........................................................................... 7
   1.4 International Inbound Logistics. ............................................................... 9
   1.5 LCL Ocean Freight. .................................................................................. 10
   1.6 Air Freight. ............................................................................................. 14

2. **Business Process Descriptions.** ................................................................. 18
   2.1 TM: Managing Bookings. ........................................................................ 18
   2.2 TM: Managing Freight Orders. ................................................................. 19
   2.3 TM: Managing Transportation Requirements. ......................................... 21
   2.4 TM: Managing Forwarding Orders. ......................................................... 22
   2.5 TM: Planning Freight and Selecting Carriers. ......................................... 24
   2.6 TM: Tendering Freight. ........................................................................... 27
   2.7 TM: Executing and Monitoring Freight. ................................................ 29
   2.8 TM: Settling Freight Orders for LSPs and Shippers. ............................... 32
   2.9 TM: Settling Costs for Internal Resources. ............................................. 34
   2.10 TM: Settling Forwarding Orders for Customers. .................................... 35
   2.11 TM: Settling Internal Charges for Forwarding Orders. .......................... 37
Caution

This document contains sample configuration content. Unless expressly stated otherwise in your agreements with SAP, this sample content is not part of SAP product documentation and you may not infer any product documentation claims against SAP based on this information.
1 Business Scenario Descriptions

1.1 Courier Express Parcel

Use

This business scenario is intended for shippers that want to manage parcel shipments. The shipper is a manufacturer and distributes products using a courier express parcel (CEP) service provider. The shipper creates a sales order in SAP ERP Sales and Distribution, checks the availability of the required product, and immediately creates the delivery. Within the delivery, products are packed into boxes. Because SAP ERP deliveries are integrated with planning processes in SAP Transportation Management (SAP TM), the delivery document is automatically transferred to SAP TM and converted into a delivery-based transportation requirement (DTR). SAP TM provides the necessary rules to determine the direct shipment options such as pickup and delivery time windows and service levels that fulfill the given constraints.

Transportation Charge Management (TCM) calculates the transportation charges and transfers them to SAP ERP using the Supplier Freight Invoice Request processing component to create a purchase order (PO) and the associated service entry sheet (SES). The PO is used to establish the accruals against which the carrier is paid.

Prerequisites

The following table shows the SAP application components that are required in this scenario. However, different scenario variants may require different SAP application components depending on your particular requirements.

<table>
<thead>
<tr>
<th>SAP Application Component</th>
<th>Configuration</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP TM 9.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP ERP 6.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP SCM Optimizer 11.0</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>XI Content SAPTM 1.2</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>XI Content SCM Basis 7.13</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP Event Management 9.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
</tbody>
</table>
You can implement this business scenario with different releases of the relevant application components. For more information, see:


### Procedure

The process runs as follows:

1. Creating Sales Orders
2. Planning Freight and Selecting Carriers [page 24]
3. TM: Executing and Monitoring Freight [page 29]
4. TM: Settling Freight Orders for LSPs and Shippers [page 32]

### 1.2 Domestic Outbound Transportation

**Use**

This business scenario is used by shippers who want to manage domestic outbound freight. Shippers either organize the transportation of goods manufactured by another company, or they manufacture their own products and distribute them through a network of plants, distribution centers, and possibly, third-party warehouse operations.

The shipper has a logistics organization that is responsible for the timely, cost-effective, and efficient transportation of products between facilities and from the facilities to the end customer (that is, prepaid). As part of the shipper’s preparations, the shipper sends requests for quotations (RFQs) to the carriers. Based on the responses received from the carriers, the shipper creates freight agreements that are used for invoicing.

In some cases, the shipper may also be responsible for certain parts of freight transportation arranged by the customer (that is, collection).

From a high-level perspective, the shipper completes the following tasks:

- Sends RFQs to the carriers and creates freight agreements based on their responses
- Receives the order electronically or manually through SAP ERP Sales and Distribution
- Performs availability checks in ATP
- Plans and tenders the transportation in SAP Transportation Management (SAP TM)
- Executes the transportation in SAP TM
● Calculates freight charges and accrues them in SAP TM
● Transfers the costs to SAP ERP to settle the invoice received from the carrier

Shippers in North America use different versions of this scenario in their transportation operations. These include the use of different transportation modes and different methods, which are presented in this scenario. These methods include:

● Direct Truckload Freight Orders (TL) – Shippers may automatically convert transportation requirements that are greater than a specified size into a truckload
● Less-than-Truckload – Transportation requirements that are too small to consolidate into a full truckload
● Multi-Stop Truckload – Less-than-truckload (LTL) transportation requirements that can be consolidated with other LTL transportation requirements into multi-stop truckloads (TL)
● Pool Distribution – the use of a “hub” or crossdock to distribute LTL freight consolidated into a TL and destined for a local region. The TL is transported directly from the shipper to the crossdock where the LTL freight is “cross docked” onto local delivery trucks.
● Intermodal domestic – the use of the railway infrastructure to move TL trailers or containers domestically. This is usually planned in the same way as a TL, but is physically moved from the shipper to a local railhead where it is loaded onto a container train and transported to the railhead closest to the customer. This transportation is dependent on the railway schedule and can be slower than using the TL mode, but is often less expensive.

Prerequisites

The following table shows the SAP application components that are required in this scenario. However, different scenario variants may require different SAP application components depending on your particular requirements.

Table 2:

<table>
<thead>
<tr>
<th>SAP Application Component</th>
<th>Configuration</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP TM 8.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP ERP 6.05 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP Event Management 7.01 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP NetWeaver PI 7.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP Visual Business 1.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
</tbody>
</table>

You can implement this business scenario with different releases of the relevant application components. For more information, see:

Process

The business processes run as follows:

1. Managing Transportation Requirements [page 21]
2. Planning Freight and Selecting Carriers [page 24]
3. Tendering Freight [page 27]
4. Executing and Monitoring Freight [page 29]
5. Settling Freight Orders [page 32]

1.3 Intermodal Rail Freight

Use

You can use this business scenario to manage the transportation of dangerous goods via rail.

In this scenario, a 20-foot container is handed to Continental Rail by the shipper Star Line at the container terminal in Halterm in Halifax, NS. The container, which contains dangerous goods, is transported on a scheduled train from Halterm to Toronto by Continental Rail as per the order placed by the customer. The order also states that the interchange to Burlington is to take place at the yard in Toronto, ON. The container continues its journey to Oklahoma City, crossing the U.S. border in Detroit, MI. Ocean Bond is responsible for transporting the container through the United States. The final destination of the container is Houston, TX. It is transported to Houston on a scheduled train operated by Burlington. In Houston, the container is picked up at the yard by the consignee Hendricks Platforms Inc.

Ordered Route

As an alternative, the container can be routed via Chicago, IL. Since congestion on the ordered, default route is heavy, the container can be transported along the actual route via Chicago. Continental Rail manages the transport from Toronto, ON to Chicago Heights Yard, and arranges for the container to be subsequently moved for interchange to Burlington at Chicago IM EX Yard. For the cross-town transport from Chicago Heights to Chicago IM EX, Continental Rail orders a truck subcontracted to Joe’s Trucking. The container is unloaded from the railcar and loaded onto the truck. Once transported, it is unloaded from the truck in Chicago IM EX and loaded onto a railcar. It then continues its journey to its final destination in Houston, TX. In Houston, the container is picked up at the yard by the consignee Hendricks Platforms Inc.

Alternative Route

Charges are invoiced based on the ordered route and rule 11. Continental Rail and Burlington each send an invoice to Star Line for their section of the journey. The charges on each of the invoices include the respective terminal handling at the source and destination locations. In addition to the charges for transport and supplemental services, there may be costs incurred during execution. These event-driven charges will added to the invoices as supplemental charges.
Prerequisites

The following table shows the SAP application components that are required in this scenario. However, different scenario variants may require different SAP application components depending on your particular requirements.

Table 3:

<table>
<thead>
<tr>
<th>SAP Application Component</th>
<th>Configuration</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP TM 9.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP ERP 6.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP SCM Optimizer 11.0</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>XI Content SAPTM 1.2</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>XI Content SCM Basis 7.13</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP Event Management 9.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP NetWeaver PI 7.31 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP Visual Business 2.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
</tbody>
</table>

You can implement this business scenario with different releases of the relevant application components. For more information, see:


Process

The business processes run as follows:

1. Managing Forwarding Orders [page 22].
2. Planning Freight and Selecting Carriers [page 24].
3. Executing and Monitoring Freight [page 29].
4. Settling Freight Orders for LSPs and Shippers [page 32].
5. Settling Forwarding Orders for Customers [page 35].
1.4 International Inbound Logistics

Use

You use this business scenario to manage your international inbound logistics. As an ordering party, you procure material from different overseas vendors. There are two ways in which you can manage your inbound transportation activities:

- You hand over responsibility for planning and executing transportation to a third party such as a logistics service provider or agent. In this case, you generally do not own a TM system.
- You have a responsible logistics unit within your company (internal logistics service provider), which plans the individual transportation stages. This includes specifying the vessel for ocean transportation. Depending on the applicable Incoterm, you may be responsible for arranging inbound transportation for certain stages. For example, the Incoterm FOB (Free On Board) specifies that vendors are responsible for arranging pre-carriage stages (from the source location to the port of loading), while you are responsible for arranging the inbound transportation from the port of loading to your final destination plant (main carriage and on-carriage stages).

This scenario focuses on the second variant in which you, as the ordering party, own a TM system.

By integrating SAP Enterprise Resource Management (ERP), SAP Transportation Management (TM), SAP Environment, Health and Safety (EH&S), and SAP Event Management, you can achieve the following:

- Accomplish integrated and automated purchase-order-based planning and booking processes – changes to orders are propagated automatically throughout the system
- Reduce work effort for manual planning
- Manage incompatibilities based on dangerous goods classification
- Increase visibility of shipments at all times for different roles by utilizing the Event Manager
- Assign planning responsibility to people with regional expertise (stage level planning)
- Design an automated process flow based on signals such as booking confirmations, advanced shipping notifications (ASNs), and transportation execution events

Note

This document describes a best practice scenario for the Chemical Industry; however, like most SAP TM processes, it can also be applied to other industries.

Prerequisites

The following table shows which SAP application components are required in this scenario. However, different scenario variants may need different SAP application components depending on your particular requirements.

Table 4:

<table>
<thead>
<tr>
<th>SAP Application Component</th>
<th>Configuration</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP TM 8.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
</tbody>
</table>
### SAP Application Component

<table>
<thead>
<tr>
<th>SAP Application Component</th>
<th>Configuration</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP ERP 6.05 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP Event Management 7.01 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP NetWeaver PI 7.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP Visual Business 1.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
</tbody>
</table>

You can implement this business scenario with different releases of the relevant application components. For more information, see:


### Process

The business processes run as follows:

1. **Managing Transportation Requirements [page 21]**
   - If you integrate your SAP TM and SAP EH&S systems, dangerous goods information can be accessed directly in the transportation documents. Dangerous goods checks (such as mixed loading and maximum quantity) can be carried out during freight unit building, load consolidation, and transportation, as well as which checking consistency in different transportation documents.

2. **Managing Bookings [page 18]**
3. **Planning Freight and Selecting Carriers [page 24]**
4. **Executing and Monitoring Freight [page 29]**
5. **Settling Freight Orders [page 32]**

### 1.5 LCL Ocean Freight

#### Use

This scenario describes the Less than Container Load (LCL) Ocean Freight operations of the freight forwarding company, Interforwarders, Japan. Interforwarders is a global Logistics Service Provider (LSP) organization with offices and facilities in various major Japanese and North American cities. The Interforwarders transportation network consists of forwarding houses in Tokyo, Nagoya, and Hiroshima as well as a central gateway, and container freight station in Yokohama. On the U.S. west coast, the gateway is the container freight station in Los Angeles, and forwarding houses are in Phoenix, San Diego, and San Francisco. Typically, the forwarding houses have direct customer contact, whereas the central gateway serves to coordinate and consolidate all ocean traffic through its container freight station. This means that the forwarding houses have contracts (forwarding agreements) with customers (including both shippers and consignees), which stipulate the appropriate charges and handling of shipments. The gateways, on the other hand, enter into contracts (freight agreements) with the
carriers (container shipping lines, and trucking companies) to specify optimized consolidated cost rates and volume agreements.

In this scenario, the Yokohama gateway reserves container space by generating ocean bookings directly with the container shipping line, SOCAL, for specific voyages within the schedule for the trade lane from Yokohama to the port of Long Beach.

Individual LCL shipments from various shippers in the greater Tokyo area are registered by the Tokyo forwarding house by entering forwarding orders. The main voyage stage of the forwarding order is planned by assigning the shipment to an existing ocean booking. After confirmation by the gateway, the pickup at the shipper’s location and the pre-carriage from the Tokyo forwarding house to the Yokohama container freight station can be planned. In addition, the forwarding house performs all necessary export customs clearance activities and records this in the forwarding orders.

Land transportation in Japan consists of the following stages:

- Pick up of individual shipments from the shipper and transport to the forwarding house Tokyo is on an LTL (Less than Truck Load) basis
- Pre-carriage from the forwarding house Tokyo to the container freight station Yokohama is on an FTL (Full Truck Load) basis

After the consolidated truck has arrived at the Yokohama container freight station, the individual LCL shipments are loaded into the standard dry containers, which are supplied by the container shipping line. The shipping instructions (SI) are transmitted to the container shipping line, SOCAL, and the containers are transported to the Yokohama container terminal. The container shipping line confirms loading by transmitting a Shipped-on-Board message to Interforwarders. At this point, Interforwarders generates the individual Ocean House Bill of Ladings and sends it to its customers.

Once the containers reach the port of Long Beach, the Los Angeles gateway of Interforwarders confirms the Arrival at Destination and its container freight station deconsolidates the containers. The U.S. subsidiary of Interforwarders organizes the customs clearance of the cargo from the port. It also organizes a trucking service for delivering the LCL shipments to the consignees in the United States. SOCAL bills Interforwarders Japan for handling, and ocean transport, and Uchida trucking bills for the land transport and pickup services. The Tokyo forwarding house of Interforwarders bills the individual Japanese shippers according to the Incoterms and forwarding contracts.

Prerequisites

The following table shows which SAP application components are required in this scenario. However, different scenario variants may need different SAP application components depending on your particular requirements.

<table>
<thead>
<tr>
<th>SAP Application Component</th>
<th>Configuration</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP TM 8.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP ERP 6.05 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP Event Management 7.01 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP Application Component</td>
<td>Configuration</td>
<td>Required/Optional</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>SAP NetWeaver PI 7.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP Visual Business 1.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
</tbody>
</table>

You can implement this business scenario with different releases of the relevant application components. For more information, see:


**Process**

The business processes run as follows:

1. **Managing Sailing Schedules** [page 21]
   Interforwarders maintains schedules in the SAP Transportation Management (TM) system to depict actual loops by an ocean carrier. In this scenario, the carrier SOCAL has a loop that has port calls in Yokohama, Japan and Long Beach, United States. For this port combination, Interforwarders assign their corresponding container freight stations (CFS), in this case, the CFS Yokohama and CFS Los Angeles. Individual voyages are defined from CFS to CFS and stored as a sailing schedule applicable for future LCL ocean bookings.

2. **Managing Freight and Bookings** [page 18]
   An Ocean Freight Booking is used to reserve the required container freight space with a shipping line. The booking order is created in the forwarder’s TM system and sent electronically to the shipping line. Confirmation from the shipping line, SOCAL, is also stored in the booking order along with a reference Steamship Line Booking Number. In this scenario, the booking is made with direct reference to an existing voyage of a sailing schedule for the port combination Yokohama – Long Beach. Confirmed booking orders can be used to consolidate the cargo. Charge calculation on the booking order determines the amount to be paid to the carrier or shipping line.

3. **Managing Forwarding Orders** [page 22]
   Interforwarders receives an order for transporting cargo from a customer, a Japanese shipper. This order is registered into the forwarders system as a Forwarding Order. Business partners like the shipper, consignee, notification party, desired carrier, bill to party, payer, and so on, are stored in the forwarding order. Pick up and final delivery address along with the cargo details such as weight, volume, dimensions, container details, and quantity are also stored in the forwarding order. The forwarding order is the basis for calculating the transportation charges for the shipper or consignee, depending upon the Incoterms. The freight unit, which is the execution object, is generated from the information contained in the forwarding order. A default route is used to route the cargo through different hubs and ports according to the forwarders plan. In this scenario, a default route exists from the Interforwarder station Tokyo to the Interforwarder station Phoenix. This default route guides the user to plan the route and schedule the forwarding order. In this scenario, three individual forwarding orders are created, each from separate shippers in the greater Tokyo area, and all destined for the United States.

4. **Planning Freight** [page 24]
   Since Interforwarders frequently receives requests to transport LCL single shipments from Japan to the United States, the company reserves freight space in advance using booking orders.
The freight forwarder makes a rough plan for the forwarding order using a default route and selecting an appropriate voyage from the sailing schedule for the main carriage, namely from the CFS in Yokohama to the CFS in Los Angeles. The transportation planner at the Yokohama gateway has visibility of the assignment of the forwarding order to a voyage and, upon checking the order, can confirm this request. The forwarding order is assigned to the ocean booking appropriate to this voyage. Concurrently, the capacity of the reserved freight space is checked as well as whether it is possible meet the required pickup times at the shipper and delivery times at the consignee. This determines the routing of the container and the approximate timeline. Afterwards the transportation planner, responsible for land transportation, plans the pickup of the shipment at the shipper’s location, as well as the Full Truck Load (FTL) pre-carriage transport of all shipments from the Tokyo station to the CFS in Yokohama. This is accomplished by generating Freight Orders in the TM system and assigning it to the appropriate trucking organization.

The planner prints the necessary documents, like the roadway bill, and sends them to the trucking organization.

5. Cargo Consolidation and Container Loading [page 29]
With FTL pre-carriage, the individual shipments are transported to the CFS Yokohama. Here the 20-foot dry container, provided by the carrier SOCAL for this ocean booking, is loaded according to the defined load plan. The container is sealed and the updated booking data is transmitted to SOCAL as shipping instructions. The shipping instructions reference the original ocean booking and give a more precise description of the container contents, including weight, volume, and individual shipments loaded within. The carrier SOCAL confirms receipt of the shipping instructions and issues a Master Bill of Lading Number. The M-B/L number is stored in the ocean booking together with the Steamship Line Booking Number.

6. Executing and Monitoring Transportation [page 21]
Tracking information is received by the forwarder through various channels and is updated directly in the appropriate freight orders and ocean booking. In this way, the cargo containers are tracked end-to-end from the shipper’s location to the port of destination in Long Beach.

7. Setting Freight Orders [page 32]
You can use this business process to evaluate, calculate, and distribute the transportation charges for the business partners involved on the supply side (suppliers). The transportation cost calculation is based on the outgoing transportation order (freight or booking orders). The business partners involved are supplying parties, such as the truckers and ocean carrier. This business process enables the financial transactions for supplier invoicing.

8. Setting Forwarding Orders [page 35]
Interforwarder has negotiated forwarding agreements with its customers. A forwarding agreement is a bilaterally binding contract valid for a specified time and specifies the charges, rates, and rate determinants agreed upon for the transport of cargo. The agreement implies that the customer commits to ship specified volumes within the time frame and the freight forwarder guarantees space and transportation. It may also hold information about penalties that can be incurred if the commitments are not met.

The transportation charges, calculated in the forwarding order, originate from the forwarding agreement but can contain additional charge elements (for example, services such as fumigation or repacking), which are not part of the forwarding agreement. In this scenario, a door-to-door service is provided, and the charge distribution is based on Incoterms. Even though the land transport consists of two stages, only one through rate is applied. This scenario also uses differing chargeable weight algorithms for ocean and land transport. After shipments are completed, the system creates a forwarding settlement document and transfers it to SAP ERP. Based on this document, the system creates the final customer invoice in SAP ERP.
1.6 Air Freight

Use

This scenario describes operations that involve consolidated air freight at gateways belonging to the freight forwarding company, Interforwarders. Interforwarders is a global logistics service provider (LSP) with two subsidiaries, one in Japan and one in the United States. The Interforwarders transportation network consists of forwarding houses (stations) in Tokyo and Nagoya, as well as a central gateway and two warehouses at Narita International Airport. On the U.S. west coast, there are two warehouses and a gateway at Los Angeles International Airport, as well as forwarding houses (stations) in Phoenix, AZ and San Diego, CA. Typically, the forwarding houses have direct customer contact, whereas the central gateway serves to coordinate and consolidate all air traffic. This means that the forwarding houses have contracts such as forwarding agreements with customers (including both shippers and consignees), which stipulate charges and state how goods are to be handled. The gateways act as service centers and enter into contracts such as freight agreements with the carriers to specify optimized, consolidated cost rates and volume agreements.

In this scenario, the Interforwarders gateway in Narita creates an internal master flight schedule with specific flights and transportation allocations for each carrier (in this example, Rising Sun Airlines and Oceanic Airways) for specific days of the week. Once the departure rules have been assigned the daily allocations, a master flight plan is created by defining the actual departures in a certain time period, for example six months). Based on this master flight plan, an operational flight plan containing all flights with booked capacity is extracted for a shorter time period, for example, four weeks. The system then automatically creates freight bookings for each schedule departure and assigns air waybill numbers from a predefined number range. The freight bookings can be automatically requested and confirmed by electronic data interchange or manually confirmed in the case of manual bookings.

Individual shipments from various shippers in Nagoya and the greater Tokyo area are registered by the forwarding houses in Nagoya and Tokyo in the form of forwarding orders. The forwarding houses check the shipments before manually assigning the forwarding orders to the freight booking for the main carriage stage. Alternatively, they can generate a transportation proposal in the system. At this stage, the actual route of the main carriage stage is planned and the forwarding order is assigned to a booking for the flight. Once the gateway has confirmed the main carriage stage, pickup from the shipper’s location and the pre-carriage stage from the forwarding houses in Tokyo and Nagoya to the gateway in Narita can be planned. The forwarding houses create freight orders for picking up the goods from the shipper. Once the goods have been received, any discrepancies resolved, the documents checked, outbound customs cleared, and the appropriate documentation generated, the pre-carriage stage is planned using the transportation cockpit. Generated documentation includes house air waybills (HAWBs) and HAWB labels that are to be applied to the cargo. The freight orders have to adhere to the cut-off parameters defined in the schedules from the forwarding houses to the gateway. Depending on the kind of goods delivered, these may include the dangerous goods cut-off time, the cargo cut-off time, and the document cut-off time.

The forwarding houses also perform all of the necessary export customs clearance activities and record this in the forwarding orders. Actual shipment, however, is only possible after several compliance and security checks, such as the air cargo security check, have been performed.

Land transportation in Japan consists of the following stages:

- Pickup of individual shipments from the shipper and transport to the forwarding houses in Tokyo and Nagoya
- Pre-carriage from the forwarding houses in Tokyo and Nagoya to the gateway in Narita

After the truck carrying the consolidated goods arrives at the gateway in Narita, the individual shipments are loaded as loose air freight, which is then transported to the carrier’s warehouses at the airport. The airline
confirms the departure of the plane by transmitting an Uplift confirmed message to Interforwarders. At this point, Interforwarders Japan sends the forwarding settlements to the shippers and the freight settlement to the carrier. New forwarding orders, including freight units and freight bookings for the import process, are generated from the preceding forwarding orders and freight bookings or, if the consignees do not use SAP TM, are created manually.

Once the goods arrive at the gateway in Los Angeles, Interforwarders confirms the arrival at destination. The goods are then deconsolidated for customs clearance before being reconsolidated and transported as part of a full truck load from the gateway to the forwarding houses in San Diego, CA or Phoenix, AZ. Transport is arranged using a road schedule that connects the gateway to the respective forwarding house. The forwarding houses in San Diego and Phoenix also arrange for customs clearance and delivery of goods to the consignees. They also manage billing for collect charges as defined in the Incoterms and local forwarding agreements.

Prerequisites

The following table shows which SAP application components are required in this scenario. However, different scenario variants may need different SAP application components depending on your particular requirements.

<table>
<thead>
<tr>
<th>SAP Application Component</th>
<th>Configuration</th>
<th>Required/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP TM 9.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Required</td>
</tr>
<tr>
<td>SAP ERP 6.04 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP NetWeaver PI 7.1 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
<tr>
<td>SAP Visual Business 2.0 or higher</td>
<td>See SAP Solution Manager</td>
<td>Optional</td>
</tr>
</tbody>
</table>

You can implement this business scenario with different releases of the relevant application components. For more information, see:


Process

The business processes run as follows:

1. Managing Bookings [page 18]
   Based on former shipments and growth forecasts, freight forwarders such as Interforwarders reserve capacity for a certain route and create master flight schedules for each weekday and carrier, Oceanic Airways or Rising Sun Airlines. An operational flight plan with specific departures from Narita International airport to Los Angeles International airport is created for a certain period of time on the basis of the master flight schedules. The operational flight plan consists of air freight bookings that have to be confirmed by the carriers. Confirmed freight bookings can be used to link forwarding orders, consolidate the cargo, and issue the necessary documents such as master air waybills and truck manifests.

2. Managing Forwarding Orders [page 22]
The freight unit, which is the execution object, is generated from the information contained in the forwarding order. A transportation proposal is used to determine the route between the export station and the import station.

3. **Planning Freight and Selecting Carriers [page 24]**

The forwarding houses in Tokyo and Nagoya create forwarding orders based on the transportation proposal, which results in freight unit stages. The transportation planner at the Narita gateway views the assignment of the forwarding order to a flight (based on the freight booking) and confirms the assignment after having checked the order for special handling requirements or other compatibility issues. The forwarding order is loosely assigned to the air freight booking appropriate to the flight. At the same time, the capacity of the reserved flight is checked along with the feasibility of meeting the required pickup times at the shipper and delivery times at the consignee. This determines the final routing selected by the gateway and the approximate timeline. Regardless of whether the route has been assigned, the transportation planner responsible for land transportation plans the pickup of the shipment from the shipper’s location and the pre-carriage transport of all shipments as part of a full truck load (FTL) from the forwarding houses in Tokyo and Nagoya to the gateway in Narita. To do so, the transportation planner generates freight orders in the SAP TM system for individual forwarding orders, for example, the pick-up at a shipper, or multiple forwarding orders, for example for FTL feeder trucks to a gateway. The planner prints the necessary documents, such as the roadway bill, and sends them to the trucking organization.

4. **Executing and Monitoring Transportation [page 21]**

After all the stages have been planned in forwarding orders, freight bookings, or freight orders, the execution status is monitored and repeatedly updated at different locations along the transportation chain. The responsible party for each stage ensures that the execution status is set properly via electronic integration with the respective carrier or by manually adjusting it. The receiving organization for each stage decides whether the cargo is ready for execution in the next stage or whether it must be put on hold for further processing until any issues are resolved. The export gateway plans the loading process for warehouse staging purposes, since the import gateway needs to deconsolidate and re-assign the goods to freight orders for the on-carriage stage to the import station. This step also includes the documentation for the main-carriage stage as required by the transportation mode. For example, this includes documents that govern the transfer of cargo from the gateway warehouse to the carrier.

5. **Settling Freight Orders (Settling Costs for Internal Resources [page 34] and Settling Freight Orders for LSPs and Shippers [page 32])**

You use this business process to evaluate, calculate, and distribute the transportation charges for the business partners involved on the supply side (suppliers). The transportation costs are calculated on the basis of the outgoing transportation order (freight orders and booking orders) referenced to contract rates. The business partners involved are the supplying parties, such as the truckers and air carriers. This business process enables freight settlement documents and internal settlement documents to be created for the transportation of goods from the forwarding houses to the gateways on both the export and the import side.

6. **Settling Forwarding Orders (Settling Forwarding Orders for Customers [page 35] and Settling Internal Charges for Forwarding Orders [page 37])**

Interforwarders has negotiated forwarding agreements with its customers. A forwarding agreement is a bilaterally binding contract that is valid for a specific time and defines the charges and rates agreed upon for the transport of cargo. The agreement is based on volume projections per customer trade lane and service level within the time frame, and the freight forwarder provides the respective capacity and transportation services. The forwarding agreement may also contain information about penalties that may be incurred if the commitments are not met.
The transportation charges, calculated in the forwarding order, originate from the forwarding agreement but can contain additional charge elements (for example, services such as fumigation or repacking), which are not part of the forwarding agreement. In this scenario, a door-to-door service is provided and the charge distribution is based on IncotermS. Finally, any charges that were incurred by the export station are forwarded to the import station. There, the profitability of the entire shipment is calculated.
2 Business Process Descriptions

2.1 TM: Managing Bookings

Use

You use this business process to create, change, and update bookings. In the booking process steps, you check transportation demands and assign them to bookings. If the bookings do not already exist, you have to create them. Finally, the booking process steps include triggering deliveries, sending and receiving confirmations from the carriers, and archiving completed bookings.

**Note**
- This business process is often carried out using the Transportation Planner role.
- In an air-freight scenario, containers are called unit load devices (ULDs).

Prerequisites

You have completed the following processes (optional):

- **TM: Planning Freight and Selecting Carriers** [page 24]

Process

This process runs in SAP Transportation Management (SAP TM) as follows:

1. Create or change a booking
   You create a booking or change an existing booking manually. You enter the following data:
   - Volume, weight, and pieces
   - Container types/ID (optional)
   - Locations (stops)
   - Cargo cut-off dates/times
   - Business partners and organization
   - Service levels
   You can also assign a schedule.
2. Assign a freight unit to a container
   You assign one or more freight units to a container.

3. Assign a freight unit to a booking
   You assign one or more freight units manually to the booking.

4. Assign a container to a booking
   You assign the container to the booking. Booking items are automatically updated.

5. Create a pick-up and delivery freight order
   You can create a pick-up freight order and a delivery freight order for one or more containers. The system
   copies data, such as the container number and seal information, from the containers to the pick-up freight
   order and the delivery freight order. Each container can only be assigned to one pick-up freight order and
   delivery freight order. However, you can create more than one pick-up and delivery freight order for a
   booking.

6. Create a service order
   You can create one or more service orders for the booking or one or more booking items (for example,
   containers) to cover services that have to be executed for the booking or the booking items.

7. Change or assign a freight unit
   You check whether you want to reassign a freight unit from one booking item to another.

8. Send a booking to a carrier
   You send the booking to the selected carrier.

9. Receive a confirmation and update a booking
   The system updates the booking based on the confirmed information from the carrier.

10. Send a shipping instruction
    You send the final shipping instruction, which contains data such as products and dates.

11. Set the handling execution status and the cargo execution status
    You can set the handling execution status and the cargo execution status. Moreover, you can set the shipped-
    on-board status on the stop level of an ocean booking after the vessel has departed. In an air-freight scenario,
    you can set the uplift confirmation status on the stop level of an air booking after the aircraft has departed.

12. Archive a booking
    The system archives the booking based on the time and settings.

13. Trigger delivery creation (optional)
    You can trigger delivery creation.

Result

You have finalized the booking business process. Follow up processes are:

- TM: Planning Freight and Selecting Carriers [page 24]

2.2 TM: Managing Freight Orders

Use

You use this business process to create, change, and update freight orders. In the freight order process steps, you
check transportation demands and assign them to freight orders. If the freight orders do not already exist, you
have to create them. Finally, the process steps include triggering deliveries, sending and receiving confirmations from the carriers, and archiving completed freight orders.

Note
This business process is carried out using the Transportation Planner role.

Prerequisites

You have completed the following processes (optional):

- TM: Planning Freight and Selecting Carriers [page 24]

Process

This process runs in SAP Transportation Management (SAP TM) as follows:

1. Create or change a freight order
   You create a freight order or change an existing freight order manually.
2. Assign a freight unit to a freight order
   You assign one or more freight units to the respective freight orders or freight order items manually.
3. Change a freight unit assignment
   You check whether you want to reassign a freight unit to another freight order.
4. Send a freight order to a carrier
   You send the freight order to the selected carrier.
5. Receive a confirmation and update a freight order
   The system updates the freight order based on the confirmed information from the carrier.
6. Send a shipping instruction
   You send the final shipping instruction, which contains data such as volume, products, and dates.
7. Archive a freight order
   The system archives the freight order based on the time and settings.
8. Trigger delivery creation (optional)
   You can trigger delivery creation.

Result

You have finalized the freight order business process. Follow up processes are:

- TM: Planning Freight and Selecting Carriers [page 24]
2.3 TM: Managing Transportation Requirements

Use

You can use this business process to closely integrate your SAP ERP system and your transportation planning and execution system. This process enables you to transfer order information from SAP ERP to SAP Transportation Management (SAP TM), providing the planning system with transportation requirements at a very early stage. This allows you to take advantage of longer planning horizons, which leads to better results in the optimization process and greater flexibility in the decisions that you need to take during transportation planning.

A user (for example, a sales employee, purchaser, or materials planner) can create different types of orders in the SAP ERP system (that is, sales orders, purchase orders, and stock transport orders, as well as the corresponding returns orders for each order type). The SAP TM system captures the orders as order-based transportation requirements (OTRs), based on which it creates freight units. The transportation planner uses the freight units to carry out transportation planning and optimization in SAP TM.

The planning results in SAP TM form the basis of delivery creation in SAP ERP. SAP TM can trigger the creation of the following deliveries:

- Outbound deliveries for sales orders, stock transport orders, returns stock transport orders, and returns purchase orders
- Returns deliveries for sales orders
- Inbound deliveries for purchase orders

SAP TM schedules the deliveries according to the planning results, which enables you to synchronize further processing with transportation planning.

You can combine the basic process steps (that is, transferring an order from SAP ERP to SAP TM, and creating one or more deliveries for the order) in the following ways:

- Order integration and delivery integration where SAP ERP triggers the creation of the deliveries
- Order integration and delivery integration where SAP TM triggers the creation of the deliveries
- Delivery integration without order integration where SAP ERP triggers the creation of the deliveries
- Order integration without delivery integration where SAP ERP triggers the creation of the deliveries

Note

In the process description, order is used as a placeholder for sales order, purchase order, stock transport order, or returns order. Delivery is used as a placeholder for outbound delivery, returns delivery, or inbound delivery.

Process

The business process runs in SAP TM as follows:

1. Create or update an order-based transportation requirement
   When a user creates or updates an order in SAP ERP, the system transfers the order automatically to SAP TM. The SAP TM system creates or updates an order-based transportation requirement (OTR) and the
corresponding freight units. The transportation planner carries out transportation planning for the freight units, which results in the creation of freight orders.

2. Create a delivery-based transportation requirement
   In the SAP TM system, the transportation planner can trigger the creation of deliveries in SAP ERP, either by using a batch job or using the user interface. The SAP TM system sends delivery proposals to SAP ERP, which creates the deliveries and sends a confirmation of delivery creation to SAP TM. SAP ERP then sends the deliveries to SAP TM for further processing.
   The SAP TM system creates delivery-based transportation requirements (DTRs) for the deliveries received from SAP ERP. DTRs consume the OTRs created in the previous step. If required, the SAP ERP system may subsequently split or update the deliveries. The SAP ERP system then transfers information about the split or update to SAP TM.

2.4 TM: Managing Forwarding Orders

Use

You can use this business process to create and edit a forwarding order in SAP Transportation Management (SAP TM). A forwarding order in SAP TM is an order given by a customer to a logistics service provider (LSP). Based on the forwarding order, the transportation activities are planned and executed. The forwarding order is also used for the customer settlement process.

In addition, you can use a forwarding quotation to send an offer to your ordering party. After the ordering party has accepted the quotation, you can create a forwarding order based on it.

Process

The business process in SAP TM runs as follows:

1. Receive a request for quotation (optional)
   To request a forwarding quotation, the customer has the following options:
   ○ Send an electronic message
   ○ Write an e-mail
   ○ Send a request on paper
   ○ Call the customer service agent of the LSP

2. Create or change a forwarding quotation (optional)
   If the customer requests a forwarding quotation electronically (for example, within a tendering process), you can have the system create it automatically. Alternatively, the customer service agent of the LSP can create and edit a forwarding quotation manually.
   You can specify general data, the validity scope, and quotation item data. In addition, you can determine a route or calculate the charges for the forwarding quotation.

3. Send a forwarding quotation to a customer (optional)
   You can send the forwarding quotation to your ordering party and print out the document immediately or after previewing it.
4. Receive acceptance or rejection of a forwarding quotation (optional)
   If the ordering party has accepted the forwarding quotation, you can create a forwarding order based on it. Otherwise, you can cancel the forwarding quotation.

5. Request a forwarding order (optional)
   To request a forwarding order, the customer has the following options:
   ○ Send an electronic message
   ○ Write an e-mail
   ○ Send a request on paper
   ○ Call the customer service agent of the LSP
   If the customer service agent of the LSP receives the request for the forwarding order electronically, the forwarding order is created directly in the SAP TM system of the LSP (using a B2B service).

6. Create or change a forwarding order
   If the forwarding order is created automatically on the basis of an electronic message, the customer service agent of the LSP reviews it and changes the field entries as appropriate. If the forwarding order is received by e-mail, on paper, or by phone, the customer service agent of the LSP creates the forwarding order manually in the system. To create a forwarding order manually, you have the following options:
   ○ Create the forwarding order without reference to a template or an existing document
     You create the forwarding order by entering all data manually.
   ○ Create the forwarding order from a template
     You create the forwarding order from an existing template. This is mainly used for recurring business processes. You can then adjust some of the data manually.
   ○ Create the forwarding order by copying an existing document
     You can use the copy feature to copy an existing forwarding order. The system copies the data from the original to the new forwarding order. You can then adjust the data manually.
   ○ Create the forwarding order from a forwarding agreement
     You can create a forwarding order from a forwarding agreement or with reference to the forwarding agreement. Service items in the forwarding agreement are then also available in the forwarding order. In addition, further information from the forwarding agreement is automatically transferred to the forwarding order, such as the transportation mode, shipping type, and sales organization.
   ○ Create the forwarding order from a forwarding quotation
     You first create a forwarding quotation and then use the data entered there to create a forwarding order.
   ○ Create the forwarding order and subsequently assign a forwarding quotation
     You can first create a forwarding order and then, as a subsequent step, assign an existing forwarding quotation to it. You can copy the charges from the forwarding quotation to the forwarding order.

7. Send a confirmation (optional)
   After having adjusted the forwarding order to meet the customer’s requests, the customer service agent can send a forwarding order confirmation to the customer. The forwarding order confirmation sets the status of the forwarding order to Confirmed.

8. Create the documents required for import and export processing (optional)
   Based on the data of the forwarding order, you can create the report documents that are required by the legal authorities for import and export processing.

9. Create a freight unit (optional)
   A freight unit is the entity on which the physical transportation activities are performed. Based on a profile, which you can assign to the forwarding order type, the system creates one freight unit or a set of freight units. You specify the rules for creating freight units in the profile. You have the following options:
   ○ Create freight units automatically
     If you select the option Create FU automatically, the system creates the freight units according to the profile settings when it saves a forwarding order of the corresponding type.
Create freight units manually
If you have not marked the forwarding order type for automatic freight unit creation, you must create the freight units by triggering a follow-up action from the forwarding order. You can also create the freight units by running a regular batch job.

10. Start planning
In this process step, the freight units that have been created in the preceding step are selected for transportation planning activities. You have the following options:
- You can call the planning screen (transportation cockpit) directly from the forwarding order by triggering a follow-up action. You can then start working on the planning activities.
- You can assign the freight units in the stage view of the forwarding order to existing freight orders or freight bookings.
- You can create new freight orders or freight bookings from the stage view of the forwarding order and assign the freight units to them.
- If planning is carried out centrally, you can start the planning process by opening the transportation cockpit independently of the forwarding order. There, transportation planners can select their specific planning worklists based on certain profile settings.

11. Create or change existing documents (optional)
If the planning process or other activities require existing business documents to be updated, the customer service agent performs the required actions. These can include sending a new confirmation to the customer or starting follow-up processes, such as Tendering Freight [page 27].

2.5 TM: Planning Freight and Selecting Carriers

Use
You use this business process to create a transportation plan, which specifies how transportation demands are to be met by your transportation capacities and carriers. By considering appropriate constraints and objectives, planning helps you to align transportation execution with your business objectives, such as reducing costs, improving service levels, and maximizing resource utilization.

The transportation plan is created on the basis of freight documents such as road freight orders, rail freight orders, ocean freight bookings, or air freight bookings to meet the demands from the following business objects:

- Order-based transportation requirements received from SAP ERP
- Delivery-based transportation requirements received from SAP ERP
- Forwarding orders managed in SAP Transportation Management (SAP TM).

SAP TM provides various tools that you can use to plan your transportation activities:

- Manual planning allows you to create and change freight documents interactively, and carrier selection allows you to assign appropriate carriers. Your current transportation plan is displayed in the transportation cockpit, which provides a rich set of planning options with its highly flexible and configurable layout.
- Automatic planning and carrier selection are both based on optimization algorithms, which together determine the best transportation plan and carrier assignment for a given set of constraints and costs.
This business process runs as follows:

1. Determine the planning scope
   You use profiles and settings to determine the transportation requirements and capacities that are to be planned. Alternatively, you use selection criteria to determine the planning scope.
2. Perform automatic or manual planning
Planning is based on freight units, which in turn are based on order-based transportation requirements, delivery-based transportation requirements, or forwarding orders. Freight units represent the transportation requirements for which a transportation plan is to be created.
Freight units are inseparable units that are transported together throughout the entire transportation chain. Freight unit building takes into account the maximum order size, the available vehicle capacity, and any incompatibilities (for example, between products).
For each freight unit, the system enables you to define a route within the transportation network. The route is defined by freight unit stages, for example, for pre-carriage, main carriage, and on-carriage. Freight unit stages can be created manually or automatically.
As a result of planning, freight units are grouped into freight documents, which can be assigned manually or automatically to resources such as trucks. Freight units can also be assigned to trailer units or railcar units, which, in turn, can be assigned to trucks and locomotives as well as road freight orders and rail freight orders.
Automatic planning is based on an optimization algorithm, which can be configured in accordance with your business scenario and can take into account factors such as the transportation network, resource availability and capacity, time windows, incompatibilities, and costs.
For road freight orders, a load plan can be generated which determines the positions of pallets on a truck and takes constraints such as the height, length, or width of the cargo body as well as the maximal axle weight of the resource into consideration.

3. Review the planning result
You can review the planning result as shown by the freight documents.

4. Revise the plan (optional)
If you identify a need for changes or further improvements, you can change the current plan.

5. Trigger delivery creation (optional)
If planning is based on sales orders, you can trigger delivery creation in SAP ERP.

6. Select and assign a carrier (optional)
If a freight document is to be subcontracted, you can manually or automatically select the appropriate carrier. Automatic carrier selection is based on an optimization process, which takes into account transportation charges, allocations, business shares, and continuous moves. Continuous moves group several freight documents for the same carrier so that a predefined discount can be obtained.
A tendering process starts if you or the system determines more than one possible carrier and tendering has been configured in your system. The tendering process can use a mixture of different tendering modes, such as peer-to-peer or broadcast tendering. You can define a timeout in the system so that it retenders the freight order to another carrier, or switches from one mode of tendering to the next. The tendering process results in one carrier being assigned to execute the freight order.

7. Send freight order to carrier (optional)
If the freight order is to be executed by a carrier, it is sent to the carrier so that the subcontracting processes can be documented.

8. Execute the freight order
Once planning is complete and the freight order has been sent to the carrier (in the case of subcontracting), the freight order is used as the basis for execution.
Replanning can occur several times, taking into account the updated information from the execution. This cycle of planning and execution is repeated during day-to-day business.
2.6 TM: Tendering Freight

Use

You use this business process to send freight requests for quotation (freight RFQs) to carriers. Carriers can accept or decline these freight RFQs and change data such as the price when they return the freight quotations. You can then automatically accept the tendering and send the freight order back to the awarded carrier. A tendering process starts if you or the system determines more than one possible carrier. This tendering process can use a mixture of different modes of tendering (peer-to-peer or broadcast tendering). You can define a timeout in the system so that the system either tenders the freight order to another carrier or switches from one tendering type to the next. The tendering process results in one carrier being selected to execute the freight order.

Note

This process is carried out using the Transportation Planner role.

Prerequisites

You have completed the following business process:

- TM: Planning Freight and Selecting Carriers [page 24]
Process

Figure 2: Tendering Process in SAP TM

This process runs as follows:

1. Start tendering
   You start the tendering process. The process can be initiated by selecting an existing tendering profile. The tendering steps can also be created manually and stored as a tendering template. The process can involve the following:
   - Definition of price limits and time limits
   - Assignment of visibility settings (determines whether a carrier is allowed to change prices and dates)
2. Perform peer-to-peer tendering  
The system sends the freight RFQs or freight orders one after the other to the specified carriers.

3. Perform broadcast tendering  
The system sends the freight RFQs to all carriers simultaneously.

4. Create quote  
The carrier responds to the freight RFQ by submitting a quotation, for example, using SAP Transport Tendering.

5. Evaluate the responses  
You evaluate the responses from the carriers.

6. Create an automatic confirmation  
The system sends the freight order as a transportation request to the carrier. The carrier can receive the transportation request on the mobile device using SAP Transport Tendering.

7. Change the planning output  
The system updates the freight order. You may have to perform planning again.

Result

You have subcontracted the freight orders using the tendering function. Follow up processes are:
- TM: Settling Freight Orders [page 32]
- TM: Executing and Monitoring Freight [page 29]

2.7 TM: Executing and Monitoring Freight

Use

This process covers the actual execution of the transportation process. The transportation planner or dispatcher checks if freight orders are ready for execution, the customs declaration is done, and the relevant documents are printed. If a customs process is involved, freight orders are blocked. When the customs management system returns a positive result, the actual execution can start. In this process, the freight orders are loaded and deliveries are performed. It deals with the various exceptions that can occur during the execution of the transportation activities. At the end of the process, the transportation planner or dispatcher receives the appropriate execution information.

During the transportation execution process in SAP Transportation Management (SAP TM), the transportation planner or dispatcher performs the following activities:
- Print the transportation documents
- Track the status of executed activities
- Adjust freight orders that are in execution
- Receive the confirmation of the completed execution
- Report discrepancies and resolve them
- Handle goods receipt processes, for example receive unplanned goods or create forwarding orders from unplanned goods receipts
Send loading and unloading instructions and receive confirmations

The execution process can be integrated with other systems, for example a customs management system, a warehouse management system, or SAP Event Management.

Prerequisites

You have completed one of the following processes:

- Managing Transportation Requirements [page 21]
- Managing Forwarding Orders [page 35]
- Managing Bookings [page 18]
- Managing Freight Orders [page 19]
- Planning Freight and Selecting Carriers [page 24]
- Tendering Freight [page 27]

Process

The business process runs in SAP TM as follows. Note that if a freight order is mentioned, the statement also applies to the freight booking:

1. Check the status of a freight order
   As a transportation planner or dispatcher, you check the status of freight orders and bookings based on the following criteria:
   ○ Tendering status and status blocks
   ○ Priority
   ○ Pick-up and delivery dates
   ○ Special instructions
   If you are using a mobile device, you can check the status of the freight orders using SAP Transport Tracker.

2. Block a freight order (optional)
   If goods in business documents are relevant for export declaration, you set the status of the freight order or booking to Blocked for execution.

3. Unblock a freight order (optional)
   If you have received all relevant information from customs, you set the status of the freight order or booking to Ready for execution.

4. Load a freight order
   The execution of the freight order starts with the following activities:
   ○ Pick-up
   ○ Bill of lading creation
   ○ Vehicle loading
   ○ Dangerous goods handling
   ○ Vehicle departure
   ○ Vehicle check-out
   ○ Sending and receiving of loading and unloading information
   You can also report these events using SAP Transport Tracker on a mobile device.
5. Arrange and print the documentation
   You print the following transportation documents for the transportation process:
   ○ Dangerous goods documents
     This includes, for example, the material safety data sheet (MSDS), if applicable.
   ○ Shipping manifest and packing list
   ○ Forwarding order (Germany only)

6. Update a freight order
   You can update freight orders, freight bookings, or freight units based on the following events or information:
   ○ Capacity shortage
   ○ Inventory shortage
   ○ Rerouting
   ○ Date or time delays
   ○ Dangerous goods information
   You can also split freight units manually.

7. Monitor the cargo in transit
   You keep track of the freight order during the execution process. You can monitor the following events, where applicable using SAP Transport Tracker:
   ○ Unexpected events
   ○ Departure and arrival dates and the picking process
   You can act on the following exceptions during the execution process:
   ○ Unexpected events
   ○ Departure and arrival dates in multi-stop scenarios

8. Handle exceptions
   If you need to handle exceptions, you may have to perform the following steps:
   ○ Notify the customer
   ○ Plan again where necessary
   ○ Update freight orders

9. Register the final delivery
   When the orders are executed, you can either manually register the proof of delivery, or enable the SAP Event Management system to trigger it automatically. You can also check if exceptions occurred during delivery, for example delay, earliness, or damage. If you are using a mobile device, you can register these events using SAP Transport Tracker.
10. Set the status of a freight order
    When the last expected execution event is finished, the system sets the status of the corresponding freight orders or bookings to Executed.

Result

You have executed freight orders or freight bookings. You can also perform the following processes:

- Settling Forwarding Orders [page 35]
- Settling Freight Orders [page 32]
2.8 TM: Settling Freight Orders for LSPs and Shippers

Use

A logistics service provider (LSP) can use a freight settlement to trigger the creation of a self-invoice or the verification of an invoice for subcontracted transportation services. The actual verification of the invoice takes place in SAP ERP. This business process ensures that the amounts you pay for execution items such as distances, weights, volumes, and containers are correct.

In addition, a shipper can use this process to distribute the freight cost at the level of delivery item or order item.

Note

This business process is carried out by the role Carrier Settlement Specialist.

Prerequisites

You have completed one of the following business processes:

- TM: Managing Bookings [page 18]
- TM: Managing Freight Orders [page 19]

Process

The business process runs in SAP Transportation Management (SAP TM) as follows:

1. Retrieve the orders or bookings for which you will be invoiced

   You can settle an invoice for freight orders, service orders, or freight bookings that are ready for invoicing. The freight orders, freight bookings, and service orders are ready for invoicing when the subcontracting status is at Carrier Assigned. You can trigger the settlement on a periodical basis, or select the freight orders, freight bookings, or service orders with the same attributes, such as carrier, organizational unit, or status.

2. Group or split the orders or bookings

   You can decide whether you want a separate invoice for each freight order, freight booking, or service order, or for each stage in a freight order or freight booking. You can also decide whether you want a collective invoice for multiple freight orders, freight bookings, or service orders. If you decide to settle a collective invoice, the following are an example of the mandatory split criteria:
   - Carrier or LSP
   - Invoice sender
   - Purchasing organization
   - Payment terms
   - Currency

   You can also define additional criteria.

3. Create the freight settlement document
Based on the grouping or splitting of the freight orders, freight bookings, or service orders in the earlier step, you create the freight settlement document. You can review and edit the freight settlement document. The document is the basis for posting accruals to accounting.

4. Update and recalculate charges (optional)
   You can copy the charges from the freight orders, freight bookings, or service orders. Alternatively, you can recalculate the charges if you want the system to take into account changed rates or information from the execution steps of the freight order, freight booking, or service order.

5. Distribute the freight costs (optional for shippers)
   As a shipper, you enable the system to distribute the freight cost to the underlying SAP ERP items that are part of the freight order or freight booking. These items are the delivery items or order items. You cannot distribute costs for service orders.
   You base the distribution on a distribution rule that you specify in the distribution profile. Distribution rules include gross weight and net weight.
   Alternatively, you can implement your own custom distribution rules and assign a rule to each charge line in a freight settlement document.

6. Transfer the freight settlement document to SAP ERP
   Once you transfer the freight settlement document, SAP ERP posts the accruals to accounting. The transferred data defines the expected amounts for the invoice verification in your SAP ERP system.

7. Process the distributed freight costs in SAP ERP (optional for shippers)
   As a shipper, if you transfer the freight settlement document in which you have distributed costs, SAP ERP posts the distributed costs to the material or general ledger accounts. You can specify how the SAP ERP system processes the distributed freight costs to suit your business requirements. You can use either a standard workflow rule or a background report to release the documents for freight cost distribution to accounting. You can also monitor the documents for freight cost posting.

8. Verify the invoices in SAP ERP.
   You can verify the invoice by triggering a self-invoicing process. The system creates the invoice based on the freight settlement document information you created, and sends the invoice to the carrier. Alternatively, the system can verify the invoice when it is received from the carrier.
   The system blocks the invoice if the amount charged in the invoice differs from the expected amount in the freight settlement document by more than a defined tolerance. You can trigger a release process for a blocked invoice.

9. Adjust the freight invoice variances (optional for shippers)
   You can distribute the freight invoice variances to the ERP items during invoice verification. You can monitor the invoice verification to check if the expected amount has been invoiced.

Result

The system posts accruals and verifies the invoice for the subcontracted services. The system also creates the corresponding financial documents and posts liabilities in accounting, which are the basis for the payment run.

For shippers, the system processes the freight cost documents and invoice variance for material valuation or general ledger posting. The system allocates the invoice amount to a cost object, such as a cost center, internal controlling order, or project.
2.9 TM: Settling Costs for Internal Resources

Use

LSPs can trigger the creation of internal settlement documents to recover costs for the use of internal resources. These resources belong to one internal organization and are used by another internal organization in the execution of a freight order.

Note

This business process is carried out by the role Carrier Settlement Specialist.

Prerequisites

You have completed the TM: Managing Freight Orders [page 19] business process.

Process

The business process runs in SAP Transportation Management (SAP TM) as follows:

1. Retrieve the freight orders for which you will create an internal settlement document for resources
   You can use internal settlements to settle costs for freight orders in which you use your own resources. Resources can include trucks and trailers. You can trigger the settlement on a periodical basis, or select freight orders with the same attributes, such as organizational unit of the freight order and status.

2. Group or split the freight orders
   You can decide whether you want a separate invoice for each freight order or whether you want a collective invoice for multiple freight orders. If you decide to settle a collective invoice, the following are an example of the mandatory split criteria:
   ○ Organization that owns and provides the resource (invoice sender organization)
   ○ Bill-to party (party that receives the invoice; the purchasing organization of the freight order)
   ○ Payment terms
   ○ Currency

3. Create the internal settlement document for resources
   Based on the grouping or splitting of the freight orders in the earlier step, the system creates an internal settlement document for the resources. You can review and edit the internal settlement document. The document is the basis for posting to accounting and financial controlling.

4. Update and recalculate charges in the internal settlement document (optional)
   You recalculate the charges in the internal settlement document.

5. Transfer the internal settlement document to SAP ERP
   When you transfer the internal settlement document, your SAP ERP system takes the following steps:
   ○ Creates the legal invoice and sends it to the invoice recipient for an intercompany settlement. The system also posts to accounting.
6. Monitor the billing and payment of the intercompany invoice (optional)
   You can monitor the payment for the transportation services and initiate a dunning process if required.

7. Retrieve the internal settlement document you want to credit (optional)
   You can create a credit memo to reverse any kind of charge, for example, the partial refund of freight charges due to overcharging. You can create a credit memo for an internal settlement document that has been transferred successfully to SAP ERP. You can choose the internal settlement document from your personal work list, or open it directly by entering the ID.
   If you follow step 7, you must follow steps 8 and 9.

8. Create the credit memo
   You can use the internal settlement document as a reference when you create the credit memo. You can manually enter the credit amount for each charge type.

9. Transfer the credit memo to SAP ERP
   When you transfer the credit memo, the SAP ERP system takes the following steps:
   - Creates the credit memo in the SAP ERP system an for intercompany settlement. The system also posts to accounting.
   - Creates a cost transfer posting, to reverse the amounts from the sending organization to the credit memo recipient for an intracompany settlement. The sending organization is the forwarding house and owns the resource. The credit memo recipient is the sales organization in the freight order.

10. Monitor the credit memo information returned from SAP ERP (optional)
    When SAP ERP successfully creates the credit memo, it updates SAP TM. The life cycle status of the credit memo in SAP TM changes to **Credit Memo Created in SAP ERP**.

### Result

SAP ERP creates and sends the invoice and credit memo for the transportation services. SAP ERP creates the corresponding financial documents. It posts the documents to accounting for intercompany settlements.

### 2.10 TM: Settling Forwarding Orders for Customers

#### Use

You can use a settlement to create an invoice for a customer to charge for transportation services. You can also send a credit memo to a customer. SAP ERP posts the financial entries and posts the revenue to accounting. You can monitor payment for the transportation services. This business process ensures that the revenue you receive is consistent with the amounts contained in execution items such as weights, volumes, distances, and containers.

#### Note

This business process is carried out by the role Customer Settlement Specialist.
Prerequisites

You have completed the TM: Managing Forwarding Orders business process. For more information, see TM: Managing Forwarding Orders [page 22].

Process

The business process runs in SAP Transportation Management (SAP TM) as follows:

1. Retrieve the forwarding orders you want to invoice
   You can settle an invoice for forwarding orders that are ready for invoicing. You can trigger the settlement on a periodical basis or select the forwarding orders with the same attributes, such as invoice recipient, organizational unit, or status.

2. Group or split the forwarding orders
   You can decide whether you want a separate invoice for each forwarding order, or whether you want a collective invoice for multiple forwarding orders. If you decide to settle a collective invoice, the following are an example of the mandatory split criteria:
   ○ Invoice recipient
   ○ Sales organization
   ○ Payment terms
   ○ Currency
   You can also define additional criteria.

3. Create the forwarding settlement document
   Based on the grouping or splitting of the forwarding orders in the earlier step, you create the forwarding settlement document. You can review the document and recalculate the charges.

4. Update and recalculate charges (optional)
   You can copy the charges from the forwarding orders. Alternatively, you can recalculate the charges if you want the system to take into account changed rates or information from the execution steps of the forwarding orders.

5. Transfer the forwarding settlement document to SAP ERP
   Once you transfer the FWSD, your SAP ERP system creates the legal invoice and sends it to the invoice recipient. SAP ERP also triggers the postings to accounting.

6. Monitor the billing and payment of the invoice (optional)
   You can monitor the payment for the transportation services and initiate a dunning process if required.

7. Retrieve the forwarding settlement documents you want to credit (optional)
   You can create a credit memo to reverse any kind of charge, for example, the partial refund of freight charges due to overcharging. You can create a credit memo for a forwarding settlement document that has been transferred successfully to SAP ERP. You can choose the document from your personal work list, or edit it directly by entering the ID.
   If you follow step 7, you must follow steps 8 and 9.

8. Create the credit memo
   You can use the forwarding settlement document as a reference when you create the credit memo. You can manually enter the credit amount for each charge type.

9. Transfer the credit memo to SAP ERP
   When you transfer the credit memo, SAP ERP creates the credit memo in the SAP ERP system. SAP ERP also sends the postings to accounting.
10. Monitor the credit memo information returned from SAP ERP
When SAP ERP successfully creates the credit memo, it updates SAP TM. The life cycle status of the credit memo in SAP TM changes to **Credit Memo Created in SAP ERP**.

**Result**

SAP ERP creates and sends the invoice and credit memo for the transportation services. SAP ERP creates the corresponding financial documents and posts them to accounting.

### 2.11 TM: Settling Internal Charges for Forwarding Orders

**Use**

You can use an internal settlement to create a settlement between internal organizations in your company. This is necessary when an internal organization needs to recover the costs incurred in delivering transportation services for a forwarding order from another internal organization. For intercompany settlements, SAP ERP posts the financial entries and also posts the revenue to accounting. For intracompany settlements, SAP ERP creates cost reposting documents from the sender organization to the receiving organization for the transportation costs.

**Note**

This business process is carried out by the role Customer Settlement Specialist.

**Prerequisites**

You have completed the TM: Managing Forwarding Orders business process. For more information, see TM: Managing Forwarding Orders [page 22].

**Process**

The business process runs in SAP Transportation Management (SAP TM) as follows:

1. Retrieve the forwarding orders that you want to invoice with an internal settlement
   You can raise an internal settlement for forwarding orders that are ready for internal settlement. You can trigger the settlement on a periodical basis or select forwarding orders with the same attributes, such as invoice recipient, organizational unit, or status.
2. Group or split the forwarding orders
You can decide whether you want a separate internal settlement document for each forwarding order or whether you want a single collective settlement for multiple forwarding orders. If you decide to create a collective settlement the following are examples of the mandatory split criteria:
- Settlement recipient (sales organization of the forwarding order)
- Sales organization of the settlement (the organization that sends the settlement). This is the forwarding house in the freight order or freight booking, performing the role of purchasing organization.
- Payment terms
- Currency
You can also define additional criteria.

3. Create the internal settlement document
   Based on the grouping or splitting of the forwarding orders in the earlier step, you create the internal settlement document. You can review the internal settlement document and recalculate the charges.

4. Update and recalculate charges (optional)
   You can copy the internal settlement charges from the forwarding orders. Alternatively, you can recalculate the charges if you want the system to take into account changed rates or information from the execution steps of the forwarding orders.

5. Transfer the internal settlement document to SAP ERP
   When you transfer the internal settlement document, the SAP ERP system takes the following steps:
   - Creates the legal invoice and sends it to the invoice recipient for an intercompany settlement. The system also posts to accounting.
   - Creates a cost transfer posting from the sending organization to the settlement recipient for an intracompany settlement. The sending organization is the forwarding house of the freight order or freight booking, in the role of purchasing organization. The settlement recipient is the sales organization of the forwarding order.

6. Monitor the billing and payment of the internal settlement (optional)
   For intercompany settlements, you can monitor the payment for the transportation services and initiate a dunning process if required.

7. Retrieve the internal settlement documents you want to credit (optional)
   You can create a credit memo to reverse any kind of charge, for example, the partial refund of freight charges due to overcharging. You can create a credit memo for an internal settlement document that has been transferred successfully to SAP ERP. You can choose the internal settlement document from your personal work list, or open the document directly by entering the ID.
   If you follow step 7, you must follow steps 8 and 9.

8. Create the credit memo
   You can use the internal settlement document as a reference when you create the credit memo. You can manually enter the credit amount for each charge type.

9. Transfer the credit memo to SAP ERP
   When you transfer the credit memo, the SAP ERP system takes the following steps:
   - Create the credit memo for an intercompany settlement. The system also posts to accounting.
   - Create a cost transfer posting, reversing the amount from the sending organization to the credit memo recipient for an intracompany settlement. The sending organization is the forwarding house of the freight order or freight booking; the credit memo recipient is the sales organization of the forwarding order.

10. Monitor the credit memo information returned from SAP ERP
    When SAP ERP successfully creates the credit memo, it updates SAP TM. The life cycle status of the credit memo in SAP TM changes to **Credit Memo Created in SAP ERP**.
Result

SAP ERP creates and sends the invoice and credit memo for the transportation services. SAP ERP creates the corresponding financial documents. It posts the documents to accounting for intercompany settlements.
Important Disclaimers and Legal Information

Coding Samples

Any software coding and/or code lines / strings (“Code”) included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended to better explain and visualize the syntax and phrasing rules of certain coding. SAP does not warrant the correctness and completeness of the Code given herein, and SAP shall not be liable for errors or damages caused by the usage of the Code, unless damages were caused by SAP intentionally or by SAP’s gross negligence.

Accessibility

The information contained in the SAP documentation represents SAP’s current view of accessibility criteria as of the date of publication; it is in no way intended to be a binding guideline on how to ensure accessibility of software products. SAP in particular disclaims any liability in relation to this document. This disclaimer, however, does not apply in cases of willful misconduct or gross negligence of SAP. Furthermore, this document does not result in any direct or indirect contractual obligations of SAP.

Gender-Neutral Language

As far as possible, SAP documentation is gender neutral. Depending on the context, the reader is addressed directly with “you”, or a gender-neutral noun (such as “sales person” or “working days”) is used. If when referring to members of both sexes, however, the third-person singular cannot be avoided or a gender-neutral noun does not exist, SAP reserves the right to use the masculine form of the noun and pronoun. This is to ensure that the documentation remains comprehensible.

Internet Hyperlinks

The SAP documentation may contain hyperlinks to the Internet. These hyperlinks are intended to serve as a hint about where to find related information. SAP does not warrant the availability and correctness of this related information or the ability of this information to serve a particular purpose. SAP shall not be liable for any damages caused by the use of related information unless damages have been caused by SAP’s gross negligence or willful misconduct. All links are categorized for transparency (see: http://help.sap.com/disclaimer).