Oracle® Warehouse Management Cloud

Integration Document

Update 18C

Part No. E95178-01

September 2018

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Oracle® Warehouse Management Cloud Integration Document, Update 18C

Part No. E95178-01

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Preface

Oracle Warehouse Management Cloud was formerly known as LogFire.

Change History

Date	Document Revision	Summary of Changes
03/2018	-01	Original
07/2018	-02	Updated order to order_hdr, updated stop_ship_flag to stop_ship_flg.
08/2018	-03	Updated section 17, Extended Property.
08/2018	-04	Added literals to supported entities to section 6, Init Stage Interface.

Integration with Cloud WMS

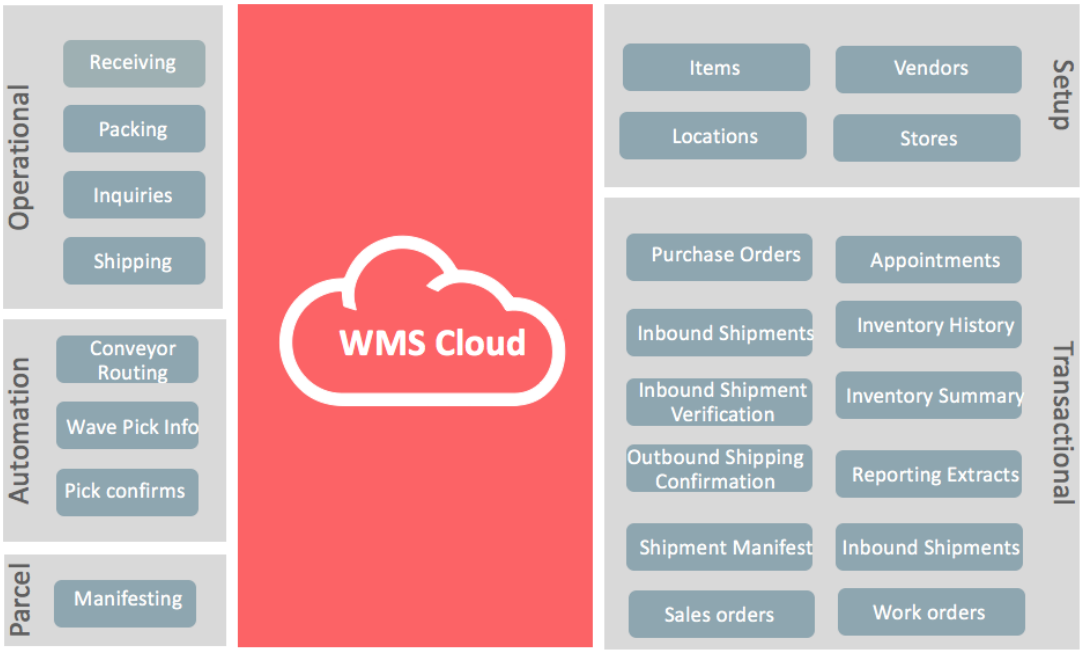
Oracle WMS Cloud supports integration under the following categories

[Automation and operations]

[Parcel]

[Setup and transactional data]

- Key Touchpoints:



Communication and data

There are two main data formats supported by Oracle WMS Cloud in its built in interfaces and APIs:

- XML
- Delimited flat data

There are two main forms of communication protocols supported by Oracle WMS Cloud WMS for integration with external systems:

- REST Web Services over HTTPS
- Secure FTP (SFTP)

Typically the delimited flat data format is used over SFTP although it is also supported via certain WebServices. WebServices generally support an XML payload with certain ones also supported the delimited flat data format.

For Parcel integration, connection to external SOAP APIs is supported.

Automation and Operations

A set of web service APIs are provided to handle the following:

- Integration with automated systems whether MHE or Voice
- To perform WMS operations to be invoked externally

Automation

Oracle WMS Cloud supported integration with MHE in two ways:

- Prebuilt integrations with certain MHE Vendors and for predefined flows.
- Standard Oracle WMS Cloud APIs

As of version 8.0.0 (2017), the prebuilt interfaces are supported, but they will not be enhanced in the future. Standard Oracle WMS Cloud APIs will be enhanced to support all MHE operations

Unless explicitly noted, all incoming automation interfaces are only available via REST Webservices and not via SFTP/files

Please see the web services listing for details

Parcel Carrier Integration

Oracle WMS Cloud supports integration with several parcel carriers via multiple mechanisms

- Integration with FedEx via Web Services provided by FedEx
- Integration with UPS via Web Services provided by UPS
- Integration with UPS, DHL GlobalMail via ConnectShip Web Services

For direct integration with FedEx and UPS, customers need to have an account with the carrier and get credentials to access the carrier web services from the Carrier. The customer then setups the Oracle WMS Cloud application with these credentials. ConnectShip works similarly except that it is a third party that facilitates shipping via multiple carriers. Customers have to setup an account with Connectship in addition to the parcel carrier they wish to use.

As of version 8.0.0, the above integrations will continue to be supported and enhanced.

Setup and transactional data

This refers to the set of setup and transactional entities that must be integrated with ERP or other 'host' systems in order to get data into and out of the WMS. Please refer to the OWM-InterfaceFormats-Logfire-WMS excel document for all the entity definitions and fields. The document is modeled towards the delimited file structure, however all the fields are the same as that use in the XML via Web Services. Refer to the XSD's for the XML schema definitions.

There are three different ways to upload these entities into WMS

- Upload excel or flat file via Input Interface Screen in the application.
- Oracle WMS Cloud provides excel templates and flat file format definitions.
- Use web services with XML payload to load the data.
- For XML, XSD schema definitions and sample XMLs are available
- Send flat files to the SFTP site (this is normally available only in production or customer test accounts)

Touchpoints into WMS:

Touchpoint	Description	SFTP	WebService
Item	Master item (SKU) definitions	Y	Y
Item barcode	Vendor barcodes	Y	Y
Item facility	Facility specific item properties	Y	Y
Item pre pack	Predefined kit definitions	Y	Y
Cubiscan	Item dimensional information	Y	
Vendors	Vendor definitions	Y	Y
Store	Destination stores for shipping	Y	Y
Location	Warehouse (DC) location defintions (bins)	Y	

Touchpoint	Description	SFTP	WebService
Site	Facility stype of site. Used when shipping to a generic site or to model individual customers	Y	Y
Shipto Company	Destination companies	Y	
Asset	Assets such as high value pallets, totes used in a warehouse	Y	
Consolidation location map	Mapping stores and locations for store distribution configuration	Y	Y
LPN Location lock	Locate LPNs and lock. Used in initial data setup in combination with IB Shipment interface	Y	
Planned OB Load	Load planning for Orders from a TMS		Y
Users	User definitions	Y	
Routes	Static routes definition	Y	
Price labels	Pricing information for Items	Y	
Purchase Orders	Purchase order transactional data	Y	Y
IB Shipments	Shipments of incoming inventory that may or may not be tied to PO's	Y	Y
IB Shipment serial nbr	Serial number information in IB Shipments	Y	Y
Appointments	Appointments for inbound loads	Y	Y
Orders	Sales orders (shipping requests)	Y	Y

Touchpoint	Description	SFTP	WebService
Order instructions	Order picking/packing instructions	Y	Y
Work order	Work orders	Y	Y
Point of sale	Store POS update	Y	

Touchpoints out of WMS:

Touchpoint	Description
IB Shipment verification	Confirmation of received inventory
Inventory History	All WMS activities
Outbound Load shipment	Outbound shipment confirmation for LTL/TL
Parcel Manifest	Shipping confirmation for parcel
Inventory summary	Summary of all inventory
Wave Pick Info	Wave data to send to MHE or other systems

WMS Web Service APIs

Oracle WMS Cloud provides REST based Web Service APIs to perform various operations within the WMS. The currently available APIs are focused primarily towards data integration for getting data in and out of the application. A few additional APIs are available for key WMS operations. See the Technical Notes section for a detailed description of how Oracle WMS Cloud API request headers must be structured. The section also has some background information on APIs and Web Services in general. You can use the Chrome plugin Postman to try out accessing Oracle WMS Cloud web services. Make sure that the user you use has the permission listed below.

Authentication and Authorization

In order to access an endpoint, the request must contain, using BasicAuth, a valid WMS username and password. Within the WMS, the user must have the WMS permission "can_run_ws_stage_interface". The user must also have eligibility to any facility/company combinations represented in the data.

Response Structure

Oracle WMS Cloud API's respond with the following XML response (sample):

```
<?xml version="1.0" encoding="utf-8"?>
<root>
  <success>True</success>
  <response>
     <message>Process stage item submitted for file group 41415472</message>
     <errors/>
     <data/>
  </response>
</root>
```

API	Description	Category	Initial Version
Run Stage Interface	Trigger validation & processing of data already in stage tables.	Setup and transactional data	6.1
Update OBLPN Tracking Number	Update tracking number and other OBLPN parcel stats.	Automation & Operations	6.1
Run MHE Stage Interface	Invoke an MHE interface to process data in MHE stage tables	Automation & Operations	6.2
Update OBLPN Dimensions	Update OBLPN weight, volume etc.	Automation & Operations	6.2
Ship OBLPN		Automation & Operations	6.2
Init Stage Interface	Main API for input data integration. Pass data in to validate and process	Setup and transactional data	6.4.0

API	Description	Category	Initial Version
Get Next Number	Get next number from specified counter	Automation & Operations	7.0.0
Get Status	Get status of an entity	Automation & Operations	7.0.0
Assign OBLPN to Load		Automation & Operations	7.0.0
Create LPN		Automation & Operations	7.0.1
Receive LPN		Automation & Operations	7.0.1
Lock/Unlock LPN		Automation & Operations	8.0.0
Update Output Interface	Set status and error message if any on a transmitted output interface	Setup and transactional data	8.0.0
Induct LPN	Induct LPN into MHE	Automation & Operations	8.0.0
Divert Confirmation	LPN Divert confirmation from MHE	Automation & Operations	8.0.0
MHE API to Perform Cubed or Non Cubed Picking		Automation & Operations	8.0.1
Extended Property	Fetch an extended property for the requested entity.	Setup and transactional data	8.0.1
Load LPN		Automation & Operations	8.0.2
Entity Update API	Updates certain attributes of an entity	Setup and transactional data	8.0.2

API	Description	Category	Initial Version
Object Inquiry	Returns a standardize representation of the queried object	Setup and transactional data	8.0.2
From MHE Distribution Pack		Automation & Operations	8.0.2
From MHE Distribution Short		Automation & Operations	8.0.2
Update Carrier LPN Label		Setup and transactional data	8.0.2
Update Active Inventory		Setup and transactional data	8.0.2

1. Run Stage Interface

URL: https://<logfireapps_domain>/<env_name>/wms/api/run_stage_interface/

Initial WMS Version: 6.1

Overview

API to run the data import process for a stage table. It works on data already in the staging table. To load and process data, please use the InitStageInterfaceAPI.

- If no file_group_nbr is supplied, then the interface is run for every record in status Ready for the Company/Facility.
- If file_group_nbr is supplied, then all records for that group in status Ready for the Company/Facility are processed. Note that not all interfaces support the use of file_group_nbr.
- NOTE: This API is not meant to upload data and process. It's only meant to process data that has been loaded through other means. For uploading and processing data, please refer to the "Init Stage Interface" API

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
entity	Interface name	X		string
company_code	WMS Company Code	X		string
facility_code	WMS Facility Code	X		string
file_group_nbr	File group to be run		Blank	string
async	Run in asynchronous mode flag		True	boolean/string

Supported Entities

Entity Value	Interface Name	Initial Version	Supports file_group_nbr
purchase_order	Purchase Order Hdr/Dtl	-	7.0.1
item	Item	-	6.2
item_facility	Item Facility	-	
ib_shipment	IB Shipment (ASN)	-	6.2
order	Order Hdr/Dtl	-	6.2
vendor	Vendor (Company)	-	7.0.1
shipto_company	Destination Company	-	
item_barcode	Item Barcode	-	
pkt_hdr	Order Hdr/Dtl	-	6.2
store_distro	Order Hdr/Dtl	-	6.2
store	Store (Company)	-	7.0.1
appointment	Appointment	-	7.0.1
item_prepack	Item Prepacks	-	
route	Routes	-	
price_label	Price Labels	-	
site	Site (Company)	-	7.0.1

Entity Value	Interface Name	Initial Version	Supports file_group_nbr
asset	Asset	-	
cubiscan	Cubiscan	-	
work_order	Work Order/Kit	7.0.1	7.0.1

2. Update OBLPN Tracking Number

URL: https://<logfireapps_domain>/<env_name>/wms/api/update_oblpn_tracking_nbr/

Initial WMS Version: 6.1

Overview

API to update an OBLPN's tracking number and optionally weight and/or ship via.

If a Carrier LPN record for the OBLPN does not exist, the API will attempt to create it. The ship via from the allocated order will be used if one is not supplied in the arguments.

Requirements

1. The LPN must exist for the facility/company provided
2. The LPN must be of type outbound
3. The LPN status cannot be CANCELLED
4. The ship via must exist for the same company as the LPN

Request Arguments

Argument Name	Function	Required	Data Type
company_code	WMS Company Code	X	string
facility_code	WMS Facility Code	X	string
oblpn_nbr	Container number to be updated	X	string
tracking_nbr	Carrier tracking number	X	string
ship_via_code	Updated ship via		string

Argument Name	Function	Required	Data Type
weight	Updated weight		decimal
rate	Update rate		string
master_tracking_nbr	2nd tracking number		string
estimated_delivery_time	Estimated delivery date (yyyymmdd)		string
dry_ice_weight	Updated Dry Ice Weight		decimal

- Since version 9.0.0, new company parameter max_allowed_wt_vol_dim_decimal_scale controls the decimal precision for the following fields: weight and dry_ice_weight
- The precision of rate is set at 2

3. Run MHE Stage Interface

URL: https://<logfireapps_domain>/<env_name>/wms/api/run_mhe_stage_interface/
Initial WMS Version: 6.2

API to run the data import process for a staged MHE data or to run a custom MHE function.

Requires Celery to be enabled as all messages are run asynchronously by default.

Request Arguments

Argument Name	Function	Required	Data Type
entity	Interface name	X	string
company_code	WMS Company Code	X	string
facility_code	WMS Facility Code	X	string
mhe_vendor_code	MHE Vendor	X	string

Argument Name	Function	Required	Data Type
python_function	Name of custom MHE function to be run. Required if entity is 'custom'.		string

Supported Entities

Entity Value	Interface Name	Initial WMS Version
from_mhe_lpn_diverts	LPN Divert Confirmation	6.2
custom	Custom MHE Function	6.2

4. Update OBLPN Dimensions

URL: https://<logfireapps_domain>/<env_name>/wms/api/update_oblpn_dims/
Initial WMS Version: 6.2

Overview

API to update an OBLPN's dimensions (length, width, height, weight, and volume).

Any association to a container type for the OBLPN will be overwritten by the specific values provided in the API request.

Requirements

1. The LPN must exist for the facility/company provided
2. The LPN must be of type outbound
3. The LPN status cannot be SHIPPED or CANCELLED
4. Decimal values must be greater than or equal to 0.00

Request Arguments

Argument Name	Function	Required	Data Type	Initial Version
company_code	WMS company code	X	string	6.4.2
facility_code	WMS facility code	X	string	6.4.2
oblpn_nbr	Container number to be updated	X	string	6.4.2
length	Container length	X	decimal	6.4.2
width	Container width	X	decimal	6.4.2
height	Container height	X	decimal	6.4.2
calc_vol_flg	Recalculate volume based on length, width, and height	X	boolean	6.4.2
weight	Container weight		decimal	6.4.2
volume	Container volume. Ignored if calc_vol_flg is true.		decimal	6.4.2
ship_oblpn	Ship the OBLPN after making dims updates.		boolean	7.0.0
shipping_location	Barcode of shipping location. Required if shipping OBLPN.	C	string	7.0.0

- Since version 9.0.0, new company parameter max_allowed_wt_vol_dim_decimal_scale controls the decimal precision for the following fields: Length, Width, Height, Weight and Volume.

5. Ship OBLPN

URL: https://<logfireapps_domain>/<env_name>/wms/api/ship_oblpn/

Initial WMS Version: 6.2

Overview

API to locate and ship an eligible OBLPN in WMS.

Requirements

1. The LPN must exist for the facility/company provided
2. The LPN must be of type outbound
3. The LPN status must be PACKED
4. The LPN cannot already be on a load
5. The LPN cannot have any pending allocations
6. The ship location must be of type SHIPPING

Request Arguments

Argument Name	Function	Required	Data Type
company_code	WMS company code	X	string
facility_code	WMS facility code	X	string
oblpn_nbr	Container number to be shipped	X	string
locn_barcode	Barcode of WMS shipping location. Updated on container as the final WMS location before being shipped.	X	string

6. Init Stage Interface

URL: https://<logfireapps_domain>/<env_name>/wms/api/init_stage_interface/
Initial WMS Version: 6.3

Overview

API to insert data into stage table(s) and run the interface to process the data.

NOTE: This is the API to be used by external systems to exchange setup and transactional data with the WMS.

All information regarding the interface entity and file groupings are within the XML in the <Header> tag.

This API supports XML format for all supported entities and flat format for a subset.

Request Arguments

Argument Name	Function	Required	Default Value	Data Type	Initial Version
xml_data	XML to be processed	C	''	string	-
async	Run stage table entity asynchronously		True	boolean	-
validate_xml	Throws hard error on XML structure or data issues		False	boolean	7.0.1
flat_data	Pipe-delimited data to be processed	C	''	string	8.0.0
entity	Type of flat data being interfaced. Only used in conjunction with flat_data.	C	''	string	8.0.0

Assumptions

- Either xml_data or flat_data must be passed - not both.
- "async" is applicable for both XML and flat for the processing of stage data

Flat File Data

- Mimics the same process as if you had uploaded it via Input Interface UI

- API keys 'flat_data' and 'entity' are required
- Only entities "item" and "order'" are currently supported
- Supported Entity Formats
- order - Hierarchical format only (ORR)
- item - One Line format only (ITM)
- File group number format: _API_{username}_yyyymmddHHMMSSffffff
- Where ffffff is micro-seconds
- Example: _API_mrafalko_20161209112224184531

Supported Entities

Name	Entity	Version
Vendor	vendor	7.0.0
Appointment	appointment	7.0.0
Item	item	7.0.0
Item Barcode	item_barcode	7.0.0
Site	site	7.0.0
Store	store	7.0.0
Purchase Order	purchase_order	7.0.0
IB Shipment	ib_shipment	7.0.0
Order	order	7.0.0
Work Order	work_order	7.0.0
Planned OB Load	planned_ob_load	7.0.2

Name	Entity	Version
Item Prepack	item_prepack	7.0.3
Consolidation Location	consolidation_location_config	8.0.0
IB Shipment Serial Number	ib_shipment_serial_nbr	8.0.0
Item Facility	item_facility	8.0.0
Order Instructions	order_instructions	8.0.0
Literals	literals	18C

7. Get Next Number

URL: https://<logfireapps_domain>/<env_name>/wms/api/get_next_numbers/
Initial WMS Version: 7.0.0

Overview

API to get a next up number from given sequence counter.

Assumptions

1. A sequence counter is defined for the given facility/company/code

Request Arguments

Parameter	Description	Initial Version	Required	Data Type	Default
counter_code	Sequence counter code	-	X	string	
company_code	WMS company code	-		string	User's default context
facility_code	WMS facility code	-		string	User's default context
count	Number of sequences returned	-		integer	1

8. Get Status

URL: https://<logfireapps_domain>/<env_name>/wms/api/get_status/
Initial WMS Version: 7.0.0

Overview

API to get the status of an object in WMS.

Assumptions

1. Supported entity
2. Object currently exists for the given facility/company
3. The "key" parameter is a value that corresponds to the field used by the object for identification

Supported Entities & Key Fields

- ib_shipment (shipment_nbr)
- purchase_order (po_nbr)
- order (order_nbr)
- lpn (container_nbr)
- wave (run_nbr)
- load (load_nbr)
- dock (dock_nbr)
- appointment (appt_nbr)
- manifest (manifest_nbr)
- task (task_nbr)

Request Arguments

Parameter	Description	Initial Version	Required	Data Type	Default
entity	Object type	-	X	string	
key	Object identifier value	-	X	string	
company_code	WMS company code	-		string	User's default context

Parameter	Description	Initial Version	Required	Data Type	Default
facility_code	WMS facility code	-		string	User's default context

9. Assign OBLPN to Load

URL: https://<logfireapps_domain>/<env_name>/wms/api/assign_oblpn_to_load/
Initial WMS Version: 7.0.0

Overview

API to assign OBLPN(s) to a new or existing Load
Assumptions

1. If load does not exist, a new one will be created
2. If the load exists in status Shipped or Cancelled, the load will be reused
3. If the load exists in greater than Created status, but less than Shipped status, an error will be thrown
4. Supports bulk mode if more than one OBLPN given in "oblpn_nbr" parameter, separated by character defined in "delimiter" parameter
5. OBLPN must be less than Loaded status
6. If you have the "reassign_load_flg" parameter set to True, then this will not apply as the LPN will be unloaded first

Request Arguments

Parameter	Description	Initial Version	Required	Data Type	Default
load_nbr	Load OBLPN(s) will be assigned to	-	X	string	
oblpn_nbr	Delimited list of OBLPN numbers	-	X	string	

Parameter	Description	Initial Version	Required	Data Type	Default
company_code	WMS company code	-		string	User's default context
facility_code	WMS facility code	-		string	User's default context
trailer_nbr	Trailer updated on the load	-		string	""
carrier_code	Carrier updated on the load	-		string	""
reassign_load_flg	Reassign the OBLPN to new load, if already assigned to different load	-		boolean	True
require_specific_oblpn_status	Validate OBLPN has matching status (Default is Packed)	-		integer	80
delimiter	Character used to separate oblpn_nbr list	-		string	|

- Since version 9.0.0, new company parameter max_allowed_wt_vol_dim_decimal_scale controls the decimal precision for the following weight fields: oblpn_weight

10. Create LPN

URL: https://<logfireapps_domain>/<env_name>/wms/api/create_lpn/

Initial WMS Version: 7.0.1

Overview

API to create a single SKU IBLPN and associated inventory.

Can also be used to cross-dock the IBLPN to an OBLPN for a given destination facility.

Assumptions

1. The inventory is created out of thin air - it is not taken from some location in the warehouse
2. The container created is an IBLPN
3. If cross-dock mode then final container will be an OBLPN of same number
4. Appropriate inventory history records are written
5. Inventory attributes are not currently within scope

Request Arguments

Parameter	Description	Initial Version	Required	Data Type	Default
lpn_nbr		-	X	string	
qty		-	X	integer	
company_code	WMS company code	-		string	User's default context
facility_code	WMS facility code	-		string	User's default context
item_barcode		-	C	string	""
item_alternate_code		-	C	string	""
batch_number		-	C	string	""

Parameter	Description	Initial Version	Required	Data Type	Default
expiry_date	YYYYMMDD	-	C	date	""
xdock_lpn_flg	Create container then cross-dock?	-		boolean	True
order_type	Cross-dock only: xdock order type	-	C	string	""
dest_facility_code	Cross-dock only: xdock destination facility	-	C	string	""
drop_locn_barcode	Cross-dock only: Location of final OBLPN	-		string	""
lpn_weight	Created IBLPN's weight	-		decimal	""
lock_code	If provided, container will be given lock once created or cross-docked	-		string	""

- item_barcode or item_alternate_code must be provided. If both are give, item_barcode is evaluated first.
- When xdock_lpn_flg is True:
- order_type is required
- dest_facility_code is required
- drop_locn_barcode is of type DROP or STAGING
- If the item characteristics required batch number, then batch_number is required
- If the item metrics require an expiration date, then expiry_date is required, except if you've provided an existing batch number that already has an expiry date. The expiry of an existing batch is preserved, even if expiry_date is given.
- expiry_date is in the format YYYYMMDD
- expiry_date cannot be in the past

- Since version 9.0.0, new company parameter max_allowed_qty_decimal_scale controls the decimal precision for the following quantity fields: qty
- Since version 9.0.0, new company parameter max_allowed_wt_vol_dim_decimal_scale controls the decimal precision for the following weight fields: lpn_weigh

11. Receive LPN

URL: https://<logfireapps_domain>/<env_name>/wms/api/receive_lpn/
Initial WMS Version: 7.0.1
Overview

API to receive and optionally xdock an IBLPN.
Assumptions

- For cross dock mode, a valid allocation must exist.
- If receiving_location is an MHE induct location, the container will be inducted and corresponding MHE logic will be triggered.
- Requires location to be type Drop with an MHE System configured of type Conveyor

Request Arguments

Parameter	Description	Initial Version	Required	Data Type	Default
lpn_nbr	Container to be received	-	X	string	
company_code	WMS company code	-		string	User's default context
facility_code	WMS facility code	-		string	User's default context
xdock_lpn_flg	Do you want to cross dock the IBLPN after receiving?	-		boolean	True
receiving_location	Container will be located here at the end of the process, if provided	-		string	""
received_ts	If provided, will be the received	-		datetime	

Parameter	Description	Initial Version	Required	Data Type	Default
	timestamp on the container				
xml_data	Allows updating of cust fields for IB Shipment Details or Order Details	-		string	""
rcvd_trailer_nbr	If provided, will be the received trailer for the container	-		string	""

- receiving_location must of type "Dock" or "Drop" for non-xdock.
- "Staging" is also allowed for xdock.

xml_data sample:

```
<LgfData>
    <UpdateAttributeList>
        <attribute>
            <entity>order_dtl</entity>
            <attribute_name>cust_field_1</attribute_name>
            <attribute_value>ABC123</attribute_value>
        </attribute>
        <attribute>
            <entity>ib_shipment_dtl</entity>
            <attribute_name>cust_field_5</attribute_name>
            <attribute_value>DEF456</attribute_value>
        </attribute>
    </UpdateAttributeList>
</LgfData>
```

12. Lock/Unlock LPN

URL: https://<logfireapps_domain>/<env_name>/wms/api/lock_unlock_lpn/
Initial WMS Version: 8.0.0

Overview

API to lock/unlock an LPN or shipment detail.

Assumptions

1. All user's eligible companies are examined unless specific company_code is provided

Request Arguments

Parameter	Description	Initial Version	Required	Data Type	Default
lpn_nbr	Container number to be locked/unlocked	-	X	string	
action	Valid values are "lock" and "unlock"	-	X	string	
lock_code	Parent company lock to be applied/removed	-	X	string	
remove_lock_from_shipment_dtl_flg	Check for shipment detail if container doesn't exist. Unlock only.	-		Boolean	True
company_code	WMS company code	-		string	User's default context

Parameter	Description	Initial Version	Required	Data Type	Default
facility_code	WMS facility code	-		string	User's default context

13. Update Output Interface

URL: https://<logfireapps_domain>/<env_name>/wms/api/update_output_interface/
Initial WMS Version: 8.0.0

Overview

API for external systems to update an output interface record.

This is typically used for external systems to communicate failure and an error message so that it's visible to user in the UI.

Also allows triggering resend of an existing file.

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
filename	Output filename	X		string
facility_code	Output record's facility		User's default facility	string
company_code	Output record's company		User's default company	string
interface_type_code	Interface type		""	string
cust_intf_code	Custom interface identifier		""	string

Argument Name	Function	Required	Default Value	Data Type
status_id	Desired status of output record	C		integer
message	Message of output record	C	""	string
run_output_interface_flg	Trigger file resend flag		False	boolean

- status_id, message, or both are required
- company_code, facility_code, interface_type_code, and cust_intf_code are used to identify a unique record
- Valid statuses: Ready (10), Processed (90), Failed (99), Cancelled (101)
- If the status is set to Read (10) and no message is provided, any existing message is cleared
- run_output_interface_flg is only valid for records in status Ready (10)
- This mimics the same functionality as pressing the "Resend" button in Output Interface UI

14. Induct LPN

URL: https://<logfireapps_domain>/<env_name>/wms/api/induct_lpn/
Initial WMS Version: 8.0.0

Overview

Gives the ability for automated systems (MHE) to induct an LPN to a Drop location tied to an MHE conveyor system.

This will trigger the MHE Route Config rules to generate an appropriate Route Instruction message in Output Interface.

The logic mimics that of RF Induct LPN transaction.

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
xml_data	Required data in XML format	C		string

Argument Name	Function	Required	Default Value	Data Type
flat_data	Required data in delimited format	C		string

- Either xml_data or flat_data must be provided.

Data Format

Field Name	Function	Required	Data Type
facility_code	Container's facility		string
company_code	Container's company		string
lpn_nbr	Container to be inducted	X	string
induct_location	Barcode of induction location	X	string

- Flat (pipe-delimited) data is valid when using flat_data input argument
- Data must follow the order specified above in the format: facility_code|company_code|lpn_nbr|induct_location
- Multiple containers are separated by a new line
- XML data is valid when use xml_data input argument
- SEE EXAMPLE BELOW
- The "Header" section may be omitted - it is not used at this time
- If facility_code and/or company_code are not provided, the requesting user's default context is used
- The user must be eligible for all facility/company combinations
- The LPN can be Inbound or Outbound
- The induct_location must be of type DROP with an MHE Conveyor system configured
- The base induction logic is used (same as RF Induct LPN):
- An MHE Message must be active for "LPN ROUTE" for the MHE system
- Valid container statuses for induct are controlled via Facility Parm "ALLOWED_LPN_STATUSES_TO_MHE_INDUCT"

Example XML

```
<LgfData>
  <Header>
    <DocumentVersion>8.0.0</DocumentVersion>
    <OriginSystem>Host</OriginSystem>
    <ClientEnvCode>wmsdev</ClientEnvCode>
    <ParentCompanyCode>*</ParentCompanyCode>
    <Entity>route_instruction</Entity>
    <TimeStamp>2014-01-25T12:34:56</TimeStamp>
    <MessageId>1234567890</MessageId>
  </Header>
  <ListOfInductedLpns>
    <lpn_induct>
      <facility_code>FAC001</facility_code>
      <company_code>COM001</company_code>
      <lpn_nbr>LPN12345</lpn_nbr>
      <induct_location>LOCN1234</induct_location>
    </lpn_induct>
    <lpn_induct>
      <facility_code>FAC001</facility_code>
      <company_code>COM002</company_code>
      <lpn_nbr>LPN45678</lpn_nbr>
      <induct_location>LOCN5678</induct_location>
      </lpn_induct>
  </ListOfInductedLpns>
</LgfData>
```

15. Divert Confirm

URL: https://<logfireapps_domain>/<env_name>/wms/api/divert_confirm/
Initial WMS Version: 8.0.0

Overview

Gives the ability for automated systems (MHE) to confirm that an LPN was diverted or located.

This will trigger the update of the LPN's location as well as possibly completing any putaway allocations.

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
xml_data	Required data in XML format	C		string
flat_data	Required data in delimited format	C		string

- Either xml_data or flat_data must be provided.

Data Format

Field Name	Function	Required	Data Type
facility_code	Container's facility		string
company_code	Container's company		string
mhe_system_code	MHE system code that did the divert	X	string
lpn_nbr	Container that was diverted/putaway	X	string
divert_lane	The divert lane pushed down	C	string

Field Name	Function	Required	Data Type
dest_locn_brcd	Barcode of specific location	C	string

- Flat (pipe-delimited) data is valid when using flat_data input argument
- Data must follow the order specified above in the format: facility_code|company_code|mhe_system_code|lpn_nbr|divert_lane|dest_locn_brcd
- Multiple containers are separated by a new line
- XML data is valid when use xml_data input argument
- SEE EXAMPLE BELOW
- The "Header" section may be omitted - it is not used at this time
- If facility_code and/or company_code are not provided, the requesting user's default context is used
- The user must be eligible for all facility/company combinations
- The LPN can be Inbound or Outbound
- divert_lane or dest_locn_brcd must be provided
- When divert_lane is provided:
- System will locate LPN to Drop location in the given facility with the corresponding divert lane configured
- When dest_locn_brcd is provided:
- Locate the LPN to the specific location provided
- If IBLPN:
- Cannot locate to a Consolidation location
- Cannot locate to a Drop location used for IB Sort
- Must be located to a VAS location if LPN requires VAS
- Must be located to a QC location if LPN requires QC
- If putaway allocation exist
- LPN cannot have a Prevent Putaway lock
- If dest_locn_brcd matches the directed location, putaway will be completed
- If dest_locn_brcd does not match the directed location, putaway allocations will be deallocated
- Putaway allocations must be for a single location
- If OBLPN:
- Cannot locate to Active or Reserve
- Must be in status In-Picking, Picked, In-Packing, or Packed

Example XML

```
<LgfData>
  <Header>
    <DocumentVersion>8.0.0</DocumentVersion>
```

```
    <OriginSystem>Host</OriginSystem>
    <ClientEnvCode>wms6head</ClientEnvCode>
    <ParentCompanyCode>*</ParentCompanyCode>
    <Entity>divert_confirmation</Entity>
    <TimeStamp>2014-01-25T12:34:56</TimeStamp>
    <MessageId>1234567890</MessageId>
  </Header>
  <ListOfDivertConfirmations>
    <divert_confirmation>
      <facility_code>FAC001</facility_code>
      <company_code>COM001</company_code>
      <mhe_system_code>CONVYR001</mhe_system_code>
      <lpn_nbr>LPN12345</lpn_nbr>
      <divert_lane>DIVERT001</divert_lane>
      <dest_locn_brcd></dest_locn_brcd>
    </divert_confirmation>
    <divert_confirmation>
      <facility_code>FAC001</facility_code>
      <company_code>COM002</company_code>
      <mhe_system_code>CONVYR002</mhe_system_code>
      <lpn_nbr>LPN12345</lpn_nbr>
      <divert_lane></divert_lane>
      <dest_locn_brcd>LOCN1234</dest_locn_brcd>
    </divert_confirmation>
  </ListOfDivertConfirmations>
</LgfData>
```

16. MHE API to perform cubed or non cubed picking

URL: https://<logfireapps_domain>/<env_name>/wms/api/pick_confirm/

Initial WMS Version: 8.0.1

Overview

Gives the ability for automated systems (MHE) to complete allocations of the LPN (ie. pack, pick, etc.)

This will trigger the update of WMS to complete the packing operations.

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
xml_data	Required data in XML format	C		string
flat_data	Required data in delimited format	C		string

- Either xml_data or flat_data must be provided.

Data Format

Field Name	Function	Required	Data Type	Default
facility_code			string	User default facility
company_code			string	User default company
wave_nbr	wave number	X	string	
order_nbr	Order number of LPN	C	string	
item_alternate_code	Item alternate code	C	string	

Field Name	Function	Required	Data Type	Default
item_barcode		C	string	
qty	quantity packed	C	number	
pick_location	pick location of ib LPN	X	string	
from_container_nbr	If Picking is performed from reserve location then inbound LPN number is mandatory if picking from active location then inbound lpn number is not mandatory	C	string	
to_container_nbr	Outbound LPN number picked and packed into.	C	string	
action_code		X	string	
mhe_system_code		X	string	
reason_code			string	
update_inventory_on_short_flg			Boolean	False
close_container_status	Value sent is PICKED or PACKED depending on operation		string	Packed
short_on_close_flg			Boolean	False

- User needs to be eligible for facility and company
- wave number needs to exist in the system
- qty must be an integer
- from_container_nbr needs to be either "partial allocated" or "allocated" status
- LPN allocation must be associated with the mhe system given in the mhe_system_code
- Valid values for ob_lpn_status : "PACKED" "PICKED"
- Valid values for action_code : "PICK", "SHORT", "CLOSE", "COMPLETE"
    - order_nbr is required if action code is pick or short
    - if action code is pick or short at least item_alternate_code or item_barcode must be passed
    - qty is required if action code is pick or short
    - If it is pick or short you need have at least pick_location or from_containter_number)
    - If action code close or pick or short, then to container nbr is required
- Since version 9.0.0, new company parameter max_allowed_qty_decimal_scale controls the decimal precision for the following fields: qty

- Applies to the Pick and Short scenarios

17. Extended Property

URL:
https://<logfireapps_server>/<env_name>/wms/api/extended_property/<entity_name>/<key>/<extended_property>

Method:GET

Initial WMS Version: 8.0.1

Overview

API is used to fetch an extended property for the requested entity. Sometimes customers would like to get more information like fetching the number of LPN's for an order. The following are additional details about extended property:

- Entity and extended property for the entity are provided in the requesting URL. URL should also contain the entity key against which the extended property is asked for.
- Response provided will be a value of the extended property being inquired.
- For 8.0.1, support is provided for order entity and a couple of extended properties provided below. Same API will be expanded for additional entities and other extended properties for future releases.
- If facility code and company code is provided search for the entity key is done for the specific facility code and company code. If facility code and company code is not provided then entity key is searched across for the default facility and company for the API invoked users and also the user's eligible facility and company combination.

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
company_code	WMS Company Code			string
facility_code	WMS Facility Code			string

Supported Entity and Extended Property

Entity	Extended property	Supported Version	Usage
order	number_of_oblpns	8.0.1	Fetches the total count of outbound LPN's for the order number passed in the API, which are from outbound created status till cancelled status (cancelled status outbound LPN's are excluded).

Entity	Extended property	Supported Version	Usage
order	number_of_packaged_oblpns	8.0.1	Fetches the total count of outbound LPN's for the order number passed in the API, which are in Packed, Loaded, Shipped and Delivered status.

18. Load LPN

URL: https://<logfireapps_domain>/<env_name>/wms/api/assign_and_load_oblpn/

Initial WMS Version: 8.0.2
Method: POST

Overview

API to perform loading of outbound LPNs or Pallet

API can also be used to assign LPN's to load and also perform loading

Assumptions

1. If OBLPN is not assigned to a load then it must be assigned to a load before loading
2. If OBLPN is already assigned to a load and load Nbr passed is different from the already assigned load then system will assign it to a different load and perform loading.
3. OBLPN being loaded must belong to an eligible facility and company for the WMS user who is invoking the API
4. OBLPN Weight cannot be negative.
5. API will not support Load by Order Flow.
6. If LPN is associated with a Pallet and API is invoked for the LPN, we do not auto load all the other LPN's on the pallet.
7. If Weight is passed when a Pallet number is passed then weight is ignored.

Request Arguments

Parameter	Description	Initial Version	Required	Data Type	Default
oblpn_nbr	Required if pallet number is not provided.	-	C	string	
pallet_nbr	Required if outbound LPN number is not provided.	-	C	string	
company_code	WMS facility code	-	X	string	If facility code is not provided then users default facility will be considered
company_code	WMS company code	-	X	string	If company code is not provided then users default facility will be considered
load_nbr	outbound load number against	-	X	string	

Parameter	Description	Initial Version	Required	Data Type	Default
	which the lpn or pallet needs to be assigned and loaded.				
trailer_nbr	Used to search load number for assignment based on trailer number passed.	-	X	string	
dock_door_nbr	Used to search load number for assignment based on trailer number passed.	-	X	string	
oblpn_weight	Using the API outbound LPN's weight can also be updated	-	X	decimal	

Important Validations:

- Outbound LPN passed should not be less than Packed status.
- If OBLPN is in loaded or Shipped or delivered status then API responds with an error message.
- If neither Load Nbr, Dock or Trailer Nbr are passed and appropriate load number to assign is not found API responds with error.
- If OBLPN number passed is in Packed Status and is also marked for Audit company parameter, "ALLOW_LOAD_SHIP_WITH_AUDIT_PENDING" if set to "No" then API responds with appropriate error.
- While performing Loading of Pallet, if some of the LPN's are not eligible for loading, then loading of pallet fails, Error response will be for the first LPN which encountered error.
- Checks based on lock code assigned to outbound LPN and also stop ship flag on the order will be considered before performing loading.
- If the OB LPN is associated with Order whose stop ship flag is set to true, API responds with appropriate error.
- If instead of OBLPN Nbr, Pallet Nbr is passed as input pallet number passed should be valid for user's eligible facility and company.
- Outbound LPN's associated with the pallet should be in packed status. If any of the outbound LPN's fails validations, API responds with appropriate error.
- If neither Load Nbr, Dock and Trailer number is not provided, and oblpn_number or pallet_number is not already assigned to a load, respond with error.

Additional Pointers:

- If outbound LPN is not assigned to the load, API also assigns appropriate load based on the load number passed or load number determined from the trailer passed or load determined from the dock door.
- If outbound LPN is already assigned to a load, it’s not mandatory to send load_number or trailer number or dock door number exclusively, LPN will be loaded against the already assigned load.
- Load number provided in the API will be used to assign and load the LPN/pallet, even if the LPN/Pallet is assigned to a different load.
- Load number determined from the trailer number or dock door is used to assign and load the LPN/pallet, even if the LPN/Pallet is assigned to a different load.
- If Pallet or OBLPN is successfully loaded then return a success message "Pallet/OBLPN <Pallet/OBLPN Nbr> successfully loaded".
- If Pallet or OBLPN is successfully loaded then all the OBLPN's must be set to loaded status
- If all OBLPNs for an order are loaded then order is also updated to loaded status.
- If the OBLPN Weight is sent (i.e non blank) then the weight of the OBLPN must be updated.
- If Load Nbr, Dock and Trailer all three are passed then Load Nbr provided in the API takes the precedence for assigning the oblpn/pallet to the load and perform loading.
- If trailer and dock door number is provided, precedence will be given to the load associated to the trailer for assigning the oblpn/pallet to the load and perform loading.
- If trailer number is only provided, WMS will search for an open load for the trailer number for assigning and loading the outbound LPN's or pallet.
- If dock door is only provided, WMS will search for open load for the dock door for assigning and loading the outbound LPN's or pallet.

19. Entity Update API

URL:
https://<logfireapps_server>/<env_name>/wms/api/entity/<entity_name>/<key>/<sequence_number>/

Method:PATCH

Initial WMS Version: 8.0.2

Overview

API is used for updating certain attributes of an entity. Sometimes the clients would want to update certain fields of an entity like stop ship flag on the order. Entity Update API provides for an ability to modify certain fields on the requested entity.

- Entity name should be provided as part of the URL. URL should also contain the key against which the specific attributes needs to be updated.
- Sequence number key will be required if the updates are being done for supported detail tables.
- API will respond with a success or error message.
- Not all entities are supported, supported entities are mentioned below.
- If facility code and company code is provided search for the entity key is done for the specific facility code and company code. If facility code and company code is not provided then entity key is searched across for the default facility and company for the API invoked users and also the user's eligible facility and company combination.

Assumptions:

- If the fields provided for update in xml_data is not supported API will respond with an error.

Supported Entities for Entity Update

Entity	Usage
order_hdr	Refer to the following section for additional details and columns exposed. For example, to update order related fields: https://<logfireapps_server>/<env_name>/wms/api/entity>/order/order001/ xml_data needs to be specified which encapsulates the attributes to be updated. . Below mentioned are the arguments that needs to be passed for updating order when the entity passed is Order.

Parameter Name	Required	Default Value	Data Type	Comments
company_code	Optional		string	WMS Company Code, if not specified, API invoked users eligible companies will be evaluated
facility_code	Optional		string	User eligible facility code, if not specified, API invoked users eligible companies will be evaluated.
xml_data	X			Fields to be updated with specific values for the corresponding entity. Refer to section order which displays the columns supported.

purchase_order_dtl

Refer the below section for additional details and columns exposed.Example to update purchase order dtl related fields

https://<logfireapps_server>/<env_name>/wms/api/entity>/purchase_order_dtl/POTST001/1 (will update columns for particular sequence number passed).

https://<logfireapps_server>/<env_name>/wms/api/entity>/purchase_order_dtl/POTST001/0 (will update all columns on the purchase order detail).

https://<logfireapps_server>/<env_name>/wms/api/entity>/purchase_order_dtl/POTST001/ (will update all columns on the purchase order detail).

xml_data needs to be specified which encapsulates the attributes to be updated. Below mentioned section provides details about the arguments.

Parameter Name	Required	Default Value	Data Type	Comments
company_code	Optional		string	WMS Company Code, if not specified, API invoked users eligible companies will be evaluated

	facility_code	Optional		string	User eligible facility code, if not specified, API invoked users eligible companies will be evaluated.
	xml_data	X			Fields to be updated with specific values for the corresponding entity. Refer section purchase_order_dtl which displays the columns supported

active_inventory

Refer the below section for additional details and columns exposed.

Example to update active_inventory with item not tracking batch numbers, expiry date or any of the attributes(a-g) and quantity down adjusted by 2.

PATCH wms/api/entity/active_inventory/<location_barcode>/?reason_code=value&item_code=value&adjustment_qty= -2

Example to update active_inventory with item is tracking batch number only and not tracking expiry date or any of the attributes (a-g) and quantity increased by 2.

PATCH wms/api/entity/active_inventory/<location_barcode>/?reason_code=value&item_code=value&adjustment_qty= 2&batch_number=value

PATCH wms/api/entity/active_inventory/<location_barcode>/?reason_code=value&item_alternate_code=value&adjustment_qty= 2&invn_attr_a=value (This will try to search for inventory in specified location for item passed in item_alternate_code argument with attribute_a value passed in the API and rest of the other fields with blank.

Below mentioned section provides details about the arguments to be passed when Entity is active_inventory

Parameter	Required	Data Type	Default	Comments
location	X	string		Location barcode - Passed in URL
reason_code	X	string		Reason Code provided will be updated on the corresponding

				inventory history record generated
facility_code		string	User's default facility	User eligible facility code
company_code		string	User's default company	User eligible company code
item_code	C	string		Only one of item_code or item alternate code or item barcode is required
item_alternate_code	C	string		Only one of item_code or item alternate code or item barcode is required
item_barcode	C	string		Only one of item_code or item alternate code or item barcode is required
adjustment_qty	C	numeric		Non-zero value. Only one of adjustment qty or actual_qty needs to be provided.
actual_qty	C	numeric		Non-zero value. Only one of adjustment qty or actual_qty

				needs to be provided.
batch_number		string		New or existing batch tied to the inventory. If item is tracking batch number, batch_number argument needs to be passed.
expiry_date	C	date		Required if a new batch is being created and item is tracking expiration date
invn_attr_a		string		Used to filter target inventory for update.
invn_attr_b		string		Used to filter target inventory for update.
invn_attr_c		string		Used to filter target inventory for update.
invn_attr_d		string		Used to filter target inventory for update.
invn_attr_e		string		Used to filter target inventory for update.

	invn_attr_f		string		Used to filter target inventory for update.
	invn_attr_g		string		Used to filter target inventory for update.
	If the corresponding item/batch/expiry/inventory attributes do not exist in the specified location system does create a new inventory record for the location, If record found then current quantity can be passed.				

Order

Below mentioned describes the fields to be passed in xml_data argument

Field	Supported Version
stop_ship_flg	8.0.2 (can pass value of true or false)
cust_field_1	8.0.2
cust_field_2	8.0.2
cust_field_3	8.0.2
cust_field_4	8.0.2
cust_field_5	8.0.2
cust_long_text_1	8.0.2
cust_long_text_2	8.0.2
cust_long_text_3	8.0.2
cust_short_text_1	8.0.2

cust_short_text_2	8.0.2
cust_short_text_3	8.0.2
cust_short_text_4	8.0.2
cust_short_text_5	8.0.2
cust_short_text_6	8.0.2
cust_short_text_7	8.0.2
cust_short_text_8	8.0.2
cust_short_text_9	8.0.2
cust_short_text_10	8.0.2
cust_short_text_11	8.0.2
cust_short_text_12	8.0.2

purchase_order_dtl

Below mentioned describes the fields to be passed in xml_data argument

Field	Supported Version
stop_recv_flg	8.0.2 (can pass value of true or false)
cust_field_1	8.0.2
cust_field_2	8.0.2

cust_field_3	8.0.2
cust_field_4	8.0.2
cust_field_5	8.0.2

20. Object Inquiry

URL: https://<logfireapps_domain>/<env_name>/wms/api/entity/{entity}/{key}/

Method: Get

Initial WMS Version: 8.0.2

Overview

REST API developed to return a standardized output representation of the queried object.

Requirements

1. The entity specified in the URL is valid
2. A key was supplied
3. A single object was found for the entity and key

Assumptions

1. The existing Update Entity API will be combined with this new API differentiated by the HTTP method.
2. Supports an output format of XML (default) or JSON
3. Data will have empty tags trimmed by default (minimize = True)
4. Supported entities: order, item, company, iblpn, oblpn

Output Format

The requester may choose the returned format of the data by specifying it in the URL. Allowed formats are 'xml' and 'json'. The format is specified by adding "/.*format*" to the end of the URL, before any options parameters. XML is the default format if none is specified.

Examples:

```
* Default XML:   .../wms/api/entity/{entity}/{key}

* Output JSON: .../wms/api/entity/{entity}/{key}/.json

* Output XML:   .../wms/api/entity/{entity}/{key}/.xml

* With Additional Parameters:
.../wms/api/entity/{entity}/{key}/.json?facility_code=ABC123&...
```

URL Parameters

Argument Name	Function	Value
Entity	Type of Object Identifier	order/item/company/iblpn/oblpn
Key	Unique Identifying Key	Explained below

Supported Entities

Name	Entity	Version
Order	order	8.0.2
Company	company	8.0.2
Item	item	8.0.2
Inbound LPN	iblpn	8.0.2
Outbound LPN	oblpn	8.0.2

Unique key Value for each entity

Entity	Identifier Key
order	order_nbr
company	code
Item	item_code or item_barcode or item_alternate_code
Inbound LPN	container_nbr
Outbound LPN	container_nbr

Request Arguments

Parameter	Description	Default
facility_code	Context Facility	Requesting user's default context
company_code	Context Company	Requesting user's default context
minimize	Trim data to remove empty nodes	True

- Since version 9.0.0, fields will be return based on the set up of following company parameters: *max_allowed_wt_vol_dim_decimal_scale and* max_allowed_qty_decimal_scale

21. From MHE Distribution Pack

URL: https://<logfireapps_domain>/<env_name>/wms/api/from_mhe_distribution_pack/

Initial WMS Version: 8.0.2
Method: POST

Overview

Rest API to perform packing updates when MHE System is performing distribution and packing of inducted inventory.

New API which provides information related to the outbound LPN's packed by Tilt Tray Sorter or Put to Light System or Distribution Sorter. Once outbound LPN is completely packed MHE system makes an API call to perform packing updates for LPN distributed

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
xml_data	Required data in XML format	C		string

- API can be invoked by sending xml_data
- API can be invoked with packing information for one for more outbound LPNs.

Data Format

Below mentioned section describes the data elements that needs to be passed in the xml_data. Information for one or more outbound LPN's to be packed can be sent xml data.

Field Name	Function	Required	Data Type	Default
facility_code	If facility code is not sent all relevant allocations to be packed will be searched for all eligible facilities for the API invoked user. If facility code is sent allocations to be packed will be searched for the specific facility passed.		string	Users default facility
company_code	If company code is not sent all relevant allocations to be packed will be searched for all eligible companies for the API invoked user defined in WMS. If company code is sent allocations to be packed will be searched for the specific company.		string	Users default company
mhe_system_code	MHE System code which has performed the packing	R	string	
ob_lpn_nbr	outbound LPN number which is created and packed as part of distribution	R	string	
destination_facility_code	WCS system needs to send the destination facility code information associated with the outbound LPN packed	R	string	
pallet_nbr	WCS can send the pallet number if outbound LPN is palletized post		string	

	packing. Field is not mandatory. If pallet number is specified, routing will not be performed even if induction location is provided.			
current_location	WCS can send the barcode of the location where the packed outbound LPN is currently located.		string	
induction_location	Once outbound LPN is packed, if the outbound LPN is to be routed, corresponding induction location barcode can be provided. If valid induction location barcode is provided (location with mhe system of type conveyor) then WMS will try to determine the appropriate divert. Induction Location shared should be of type "Drop".		string	
distro_control_number		R	string	
wave_number			string	
ib_lpn_nbr	Specifies the inbound LPN number from which the corresponding item is packed in the outbound LPN. This field will be required for consuming the pending distribution allocations.	R	string	
item_alternate_code	Alternate Code of the sku to be distributed. Either send the item alternate code or associated item parts or item_barcode	C	string	
item_part_a		C	string	
item_part_b		C	string	
item_part_c		C	string	
item_part_d		C	string	
item_part_e		C	string	
item_part_f		C	string	
item_barcode	WCS can send the specific item_alternate_code or the corresponding item parts or the item_barcode. Item_barcode if sent will be matched with the corresponding barcode of the item or from a corresponding alternate item barcode list.	C	string	
batch_number	WCS can send the batch number corresponding to the item to be packed.	R	string	

expiry_date	WCS can send the expiry date for the item to be packed Format : YYYYMMDD000000		date	
invn_attr_a	WCS can send the inventory attribute_a value corresponding to the item to be packed from inbound LPN		string	
invn_attr_b	WCS can send the inventory attribute_b value corresponding to the item to be packed from inbound LPN		string	
invn_attr_c	WCS can send the inventory attribute_c value corresponding to the item to be packed from inbound LPN		string	
invn_attr_d	WCS can send the inventory attribute_d value corresponding to the item to be packed from inbound LPN		string	
invn_attr_e	WCS can send the inventory attribute_e value corresponding to the item to be packed from inbound LPN		string	
invn_attr_f	WCS can send the inventory attribute_f value corresponding to the item to be packed from inbound LPN		string	
invn_attr_g	WCS can send the inventory attribute_g value corresponding to the item packed in the outbound LPN		string	
allocation_uom	Depicts the UOM in which the corresponding inventory is allocated. Valid Values to be passed are UNITS, PACKS, CASES		string	
uom_qty	WCS can send the inventory attribute_f value corresponding to the item packed in the outbound LPN		decimal	
packed_qty	WCS can send the inventory attribute_g value corresponding to the item packed in the outbound LPN	R	decimal	

Assumptions

- If the individual records do fail for any business validations system, the respective errors can be seen in the application.
- API does not perform incremental packing updates, once the message is received, outbound LPN shared in the API will be updated to packed status.

Additional Pointers

- Outbound LPN number passed as part of API will be updated to packed status upon successful processing of a record.

- One outbound LPN can be packed from multiple inbound LPN's, in which case the xml will contain information of all inbound LPN's which got distributed into the corresponding outbound LPN.
- API can be used to pass induction location so that packed outbound LPN information sent from WCS can be subjected for route instruction message generation.
- Once API is invoked and appropriate outstanding allocations determined for the inbound LPN passed, corresponding packed qty shall be reduced from the inbound LPN.
- Relevant Order updates and container detail packed inventory history records shall be written.
- Since version 9.0.0, new company parameter max_allowed_qty_decimal_scale controls the decimal precision for the following fields: uom_qty and packed_qty

22. From MHE Distribution Short

URL: https://<logfireapps_domain>/<env_name>/wms/api/from_mhe_distribution_short/

Initial WMS Version: 8.0.2

Method: POST

Overview

Rest API to perform shorting updates when MHE System is performing distribution and packing of inducted inventory.

This will trigger the update of WMS to perform shorting related updates.

Request Arguments

Argument Name	Function	Required	Default Value	Data Type
xml_data	Required data in XML format	C		string
flat_data	Required data in delimited format	C		string

- Either xml_data or flat_data must be provided.
- API can be invoked with shorting information for one for more inbound LPN/sku combination. Xml or flat file data shared through API can contain multiple inbound lpn/sku combination for performing shorting updates.

Data Format

Field Name	Function	Required	Data Type	Default
facility_code	If facility code is not sent all relevant allocations to short will be searched for all eligible facility for the API invoked user defined in WMS. If facility code is sent allocations to be shorted will be searched for the specific facility passed.		string	Users default facility
company_code	If company code is not sent all relevant allocations to short will be searched for all eligible companies for the API invoked user defined in WMS. If company code is sent allocations to be shorted will be searched for the specific company.		string	Users default company
mhe_system_code	MHE System code where inventory short was observed	R	string	
ib_lpn_nbr	Inbound LPN number against which the shorting updated has to be performed.	R	string	
destination_facility_code	WCS system to share the destination facility code information for which the short needs to be performed.	R	string	

Field Name	Function	Required	Data Type	Default
item_alternate_code	Alternate Code of the sku to be distributed. Either send the item alternate code or associated item parts or item_barcode	C	string	
item_part_a		C	string	
item_part_b		C	string	
item_part_c		C	string	
item_part_d		C	string	
item_part_e		C	string	
item_part_f		C	string	
item_barcode	WCS can send the specific item_alternate_code or the corresponding item parts or the item_barcode. Item_barcode if sent will be matched with the corresponding barcode of the item or from a corresponding vendor barcode list.	C	string	
short_qty	If sent the short qty cannot be greater than the outstanding allocation for inbound LPN /sku combination. If short qty is not sent then system will perform distribution shorting updates for the outstanding allocations to be packed for Inbound LPN/Sku/Combination.	R	decimal	
distro_control_number	WCS system can send the distro control number corresponding to the ib_lpn/sku combination for which shorting needs to be performed.		string	
reason_code	Reason_code for performing shorting. Should correspond to a valid reason code in the system		string	
batch_number	WCS can send the batch number corresponding to the item to be shorted		string	
expiry_date	WCS can send the expiry date for the item to be shorted Format : YYYYMMDD000000		date	
invn_attr_a	WCS can send the inventory attribute_a value corresponding to the item to be shorted from inbound LPN		string	

Field Name	Function	Required	Data Type	Default
invn_attr_b	WCS can send the inventory attribute_b value corresponding to the item to be shorted from inbound LPN		string	
invn_attr_c	WCS can send the inventory attribute_c value corresponding to the item to be shorted from inbound LPN		string	
invn_attr_d	WCS can send the inventory attribute_d value corresponding to the item packed in the outbound LPN		string	
invn_attr_e	WCS can send the inventory attribute_e value corresponding to the item packed in the outbound LPN		string	
invn_attr_f	WCS can send the inventory attribute_f value corresponding to the item packed in the outbound LPN		string	
invn_attr_g	WCS can send the inventory attribute_g value corresponding to the item packed in the outbound LPN		string	
wave_number			string	

Assumptions

- If multiple records are shared in single API call, response is sent back to the caller once the API request is made and response is not sent back for every error occurrence.
- Deferred shorting updates is not possible through the API, once the relevant shorting record passes validations, appropriate qty will be reduced from the inbound LPN.

Additional Pointers

- User needs to be eligible for facility and company code passed.
- Inbound lpn number passed should be present in the system for performing shorting and should have relevant outstanding distribution allocations.
- mhe_system code shared should be a valid code configured in WMS.
- Destination facility code should be present in the system and open allocations needs to be present for the destination facility code shorted.
- Item information shared by sending item_alternate_code/item parts or item_barcode should correspond to a valid item for the company code shared or users eligible company list.
- Open allocation for Inbound LPN shared must be associated with the mhe_system_code shared and also the item and associated parts like batch number/expiry date and inventory attributes.
- short_qty passed should not be greater than the pending allocations determined for lpn/item and associated parts.
- Once the relevant record passes the validations
- order qty will be reduced depending upon the order type flag.

- Shorting related updates and relevant inventory history record will be written.
- Since version 9.0.0, new company parameter max_allowed_qty_decimal_scale controls the decimal precision for the following fields: short_qty

23.

Update Carrier LPN Label

URL: https://<logfireapps_domain>/<env_name>/wms/api/update_carrier_lpn_label/

Method: POST

Initial WMS Version: 8.0.2

Overview

API to update the carrier LPN Label image.

Assumptions

- Label is a required argument for Update Carrier LPN Labe API
- Label is a base64.pdf type
- carrier_webservice label type would support image or pdf.
- User will be able to send info 1 LPN at a time.

Request Arguments

Arguments	Function	Required	Default Value	Data Type
facility_code	Corresponds to a valid facility code		User default	string
company_code	Corresponds to a valid company code		User default	string
oblpn_nbr	LPN number being routed	X		string
label	Carrier LPN Label Image	X		string

24. Update Active Inventory

URL:
https://<logfireapps_domain>/<env_name>/wms/api/entity/active_inventory/<location_barcode>/

Method: PATCH

Initial WMS Version: 8.0.2

Overview

API to update the inventory in an active location.
The API will attempt to first find any existing inventory to update for the location/item/batch/invn_attr combination provided. New inventory may be created for positive adjustments.

Assumptions

- Only one of item_code, item_alternate_code, or item_barcode should be provided
    - Item require batch number and invn_attr_X_tracking are considered
    - The item may NOT track serial numbers
    - If item has Require Expiry Date set then expiry_date is required
        - If the item requires an expiry date and batch_number is provided for an existing batch, and expiry_date is not provided, then the expiry date will be taken form the batch.
        - If the item requires an expiry date and batch_number is provided for an existing batch, and expiry_date is provided, the expiry date must match that of the batch.
- Only one of adjustment_qty or actual_qty should be provided
    - actual_qty must be a positive number
    - adjustment_qty must be a non-zero number
- Location must pass attribute checks
    - Item assignment type (Permanent/Dynamic)
    - Restrict batch number
    - Restrict inventory attribute
    - Allow multi-SKU
- If locn_capacity_check_flg is set to true, location must pass capacity checks.
    - Min/Max units
        - In-transit inventory is considered
    - Min/Max volume
        - In-transit inventory is considered
- If batch_nbr is passed for a positive adjustment and the batch does not exist, it will be created
- If positive adjustment and no inventory exists for the combination, inventory will be created
- If negative adjustment, the adjustment may be spread across multiple inventory records
- Open allocations from the active location are considered in the calculations
    - Cannot down adjust the location's quantity below was is already allocated
- If the location has a lock code with 'treat_as_attribute' to one of the inventory attribute letters (a-g), and if the item updated has invn_attr_X_tracking_id=NOT_REQUIRED (where X is the same letter), then the value of lock_code will override the corresponding inventory attribute passed into the API.

Request Arguments

Arguments	Function	Required	Default Value	Data Type
facility_code	Corresponds to a valid facility code		User default	string
company_code	Corresponds to a valid company code		User default	string
reason_code	Reason for the adjustment	X		string
item_code	Item whose inventory will be updated	C		string
item_alternate_code	Item whose inventory will be updated	C		string
item_barcode	Item whose inventory will be updated	C		string
adjustment_qty	Positive or negative adjustment	C		decimal
actual_qty	Positive actual quantity	C		decimal
batch_number	Batch tied to inventory			string
expiry_date	Expiry date of inventory/batch. Format = YYYYMMDD			date
invn_attr_a	Inventory attribute A			string
invn_attr_b	Inventory attribute B			string
invn_attr_c	Inventory attribute C			string
invn_attr_d	Inventory attribute D			string
invn_attr_e	Inventory attribute E			string
invn_attr_f	Inventory attribute F			string
invn_attr_g	Inventory attribute G			string
locn_capacity_check_flg	Location Capacity Check Flag		True	boolean

- Since version 9.0.0, new company parameter .max_allowed_qty_decimal_scale controls the decimal precision for the following fields: actual_qty and adjusted_qty

Technical Notes

API Introduction

An API or Application Programming Interface is a tool used by applications to provide external applications or users to grant access to specific features of the application. Typically, this involves the passing of some argument data to a web URL (also known as an Endpoint) that has access to the API. For example, within Oracle WMS Cloud application there is an API for invoking the input data processing (init stage interface). In order to accomplish this, the API needs to know things like company, facility, the interface name, and other key pieces of information to execute correctly. Our API's allow the application to expose discrete pieces of functionality to other applications or users in a controlled manner without the need to give access to the entire system and without requiring the user interface to be used.

API Request

Each API is given a specific URL hosted as part of the WMS application. The APIs use HTTPS protocol to receive requests and return a response in much the same way that submitting a form on a website works within a browser. When the "form" is submitted, a call to a URL is made over HTTPS, which has the ability to transmit this data within the request. The data can then be extracted from the received request within the WMS application and used to run the API.

Requirements:

- Must be of type POST
- The Content-Type should be "application/x-www-form-urlencoded"
    - This allows the data to be sent in key-value pairs
- Any non-ASCII data must be URL encoded to ensure data integrity
    - See https://www.w3schools.com/tags/ref_urlencode.asp
- Any URL reserved characters (; / ? : @ = &) in the data must also be properly encoded to ensure data integrity
    - The key-value pairs are represented in the request in the format myurl.com?key1=value1&key2=value2...
    - If the reserved characters are not encoded in the data itself, they can be misunderstood to have special meaning and cause data corruption when parsing the request.

API Response

Once the API has completed (successfully or not) within the WMS application, an HTTP response is sent back to the requester. WMS APIs will always return a response. This is similar in the way in which a webpage is returned to a requesting user's browser. However, instead of webpage data, all Oracle WMS Cloud APIs are designed to give a standardized response.

Web Services & REST overview

This section is intended to give a high level overview of web services, how they work, and how customers use them. Web services are a common method by which machines are able to passing data, files, or invoking a process over the internet using the HTTP protocol. The two main flavors of web services are SOAP (Simple Object Access Protocol) and REST (Representational State Transfer). This section will focus primarily on REST (a service based on REST is called a RESTful service) as it's the web service method used by Oracle WMS Cloud.

Objective of Web Services

- The main object of web services is to provide a window to a resource on a server
- A resource can be a document, picture, video, web page, API, or anything that can be represented in a computer system

Why REST Web Services?

- RESTful services are lightweight, maintainable, and scaleable (all important things for a cloud application)

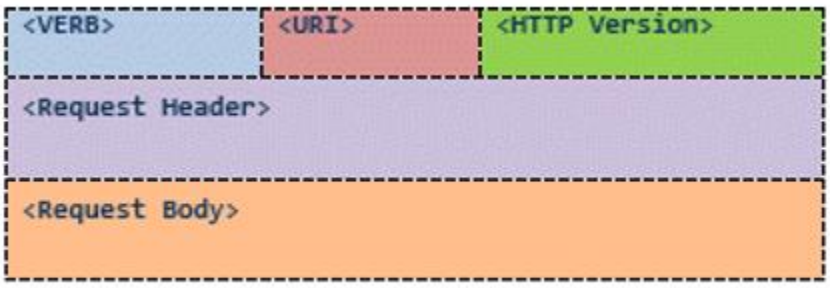
How Do Web Services Utilize HTTP?

- HTTP is the underlying protocol used by web services
- This is the same protocol you just used to request this web page (a resource!) in your browser
- HTTP provides mechanisms to handle the requests and responses to RESTful services
    - This includes transferring data and/or files
- The Client/Service/Server Relationship
    - A client is the system connecting to and making a request to a service hosted on a server
    - The server processes the request, returns a response to the client, and closes the connection

HTTP Messages

- Clients and services talk to each other via messages
- HTTP messages follow a request and response cycle; each request by the client requires a response from the server
    - It's possible to not get a response from the server. That typically means there was an issue with the server's execution of the request.
- Requests to a service and responses from a service are both structured messages
- The actual message is just a series of lines of plain text (see Request Example below)

Request Structure



An HTTP request is really nothing more than several lines of text that tell a client about the request it needs to execute.

Here we will discuss the components of a request and then walk through an example using the Google Chrome extension, POSTman.

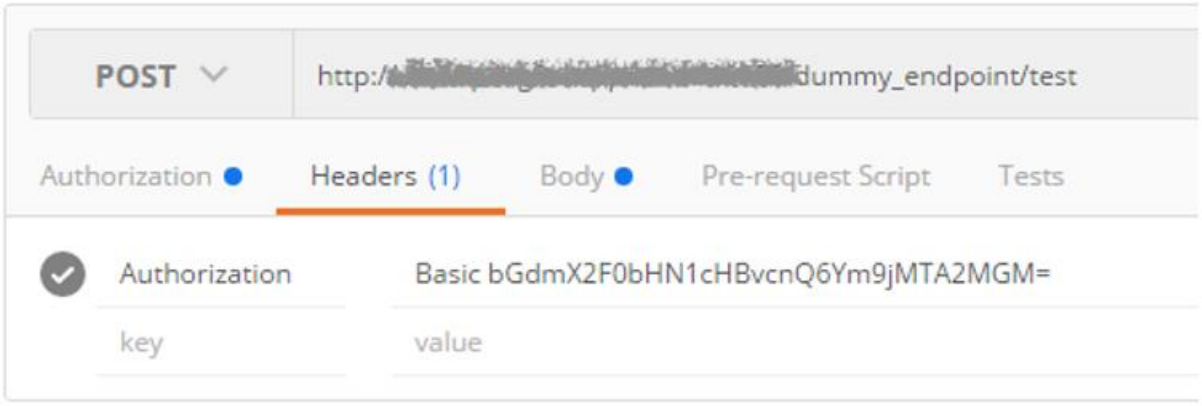
- Verb
- An HTTP method that defines the action of the request

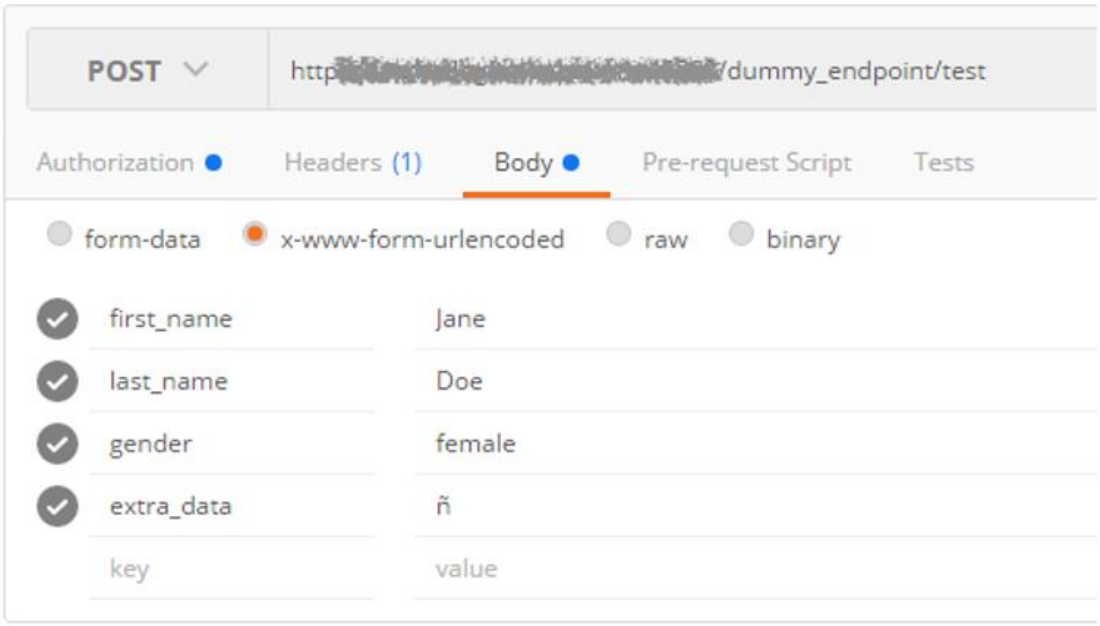
- Examples: GET, POST, PUT, DELETE, ...
    - WMS primarily requires clients to POST to our resources
    - Some clients and Jitterbit may utilize GET
- URI (Uniform Resource Identifier)
    - A URI is a resource on a server that can be accessed by a service
    - The most common form of URI is a URL (Uniform Resource Locator)
    - A URL specifies both the primary access mechanism and network location
        - In simple terms a URL identifies the network and location of the resource being accessed
        - Example: http://example.org/wiki/Main_Page
            - This URL refers to the resource /wiki/Main_Page that is obtained via HTTP from a network whose domain name is example.org
- HTTP Version
    - Current version is "HTTP v1.1"
- Request Header
    - Contains request metadata in a collection of key-value pairs
    - In general, this is information about the request, the requesting client, authorization, and the format of any data in the request body
- The most important header keys for WMS's purposes are:
    - Authorization - An encrypted username/password combination that may be required to access the service
    - Content-Type - Defines the format and possibly the encoding (charset) of the data in the request body for POST requests
        - The format is known as a MIME Type
        - Important POST MIME Types:
            - application/x-www-form-urlencoded
                - Alphanumeric data is encoded (convert legal non-ASCII characters to a representation using allowed characters) and sent in key-value pairs in the request body
                    - Any illegal characters, like ñ, are encoded to an ASCII hex representation like "%XX" and then decoded back after transmission
                    - Example: If you have one field "Name" with a value of "Mary" and another field "Gender" set to "Male", it would be represented as: Name=Mary&Gender=Male
            - multipart/form-data
                - The data is sent in key-value pairs in the request body in multiple parts
                - Typically used for transmitting files (binary data)
                - Good for transmitting large amounts of data
            - application/xml
                - The content of the request body is XML
- Request Body
    - The actual content (data) of the message
    - Format (and possibly encoding) is determined by the Content-Type header

- Key-value pairs are represented in the format: key1=value1&key2=value2&key3=value3...
  - key/value are separated by "="
  - pairs are separated by "&"
- However, if for example the Content-Type is set to "application/xml" there would be no key-value pairs, just an XML message

Oracle WMS Cloud Request Example (key-value pairs)

Using the POSTman Google Chrome extension, here's a sample HTTP request





You can see from the screenshots that we have:

1. A request verb of POST
2. A URI (URL) of http://xxxxxxxxxxxxxx/dummy_endpoint/test
3. An Authorization header (I had put in a username/password and POSTman encrypted it for me)
4. A Content-Type header of "application/x-www-form-urlencoded", which tells us that the data in the request body will be key-value pairs
    a. Even though you don't see this explicitly in the headers screenshot above, it will be present in the actual request shown below
5. 4 data keys with corresponding values in the request body: first_name, last_name, gender, and extra_data

When we convert this request from the POSTman UI to HTTP:

This is the request information that is actually transmitted!

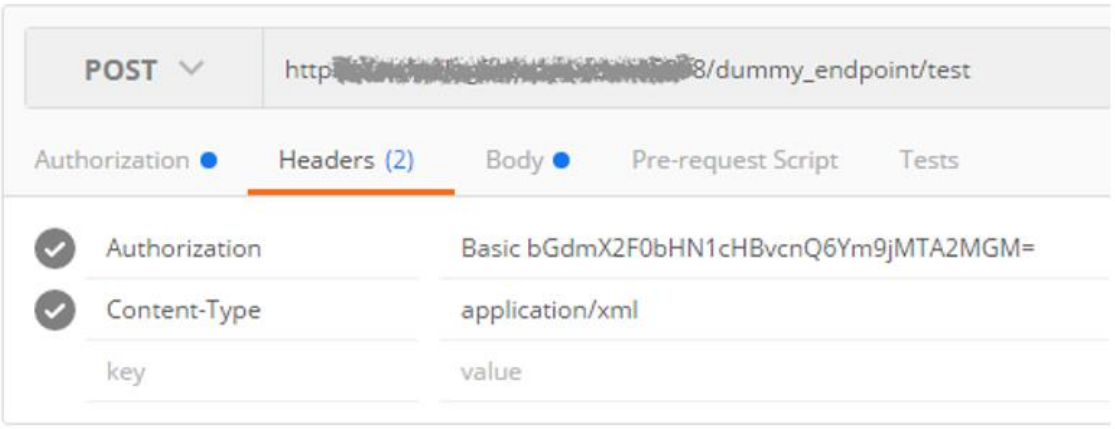
1. It tells HTTP that we want to POST a request to the host xxxxxxxxxxx for resource /dummy_endpoint/test using HTTP version 1.1
2. It also shows that we have the request headers Authorization, Cache-Control, Postman-Token, and Content-Type
    a. You don't need to worry about Cache-Control or Postman-Token
3. It is shows the request body data as key-value pairs represented in the format discussed
    a. This is expected since the Content-Type is set to "x-www-form-urlencoded"
4. Finally, we can see that it encoded the illegal ñ character to "%C3%B1" for transmission
    a. %C3%B1 is the UTF-8 representation of ñ

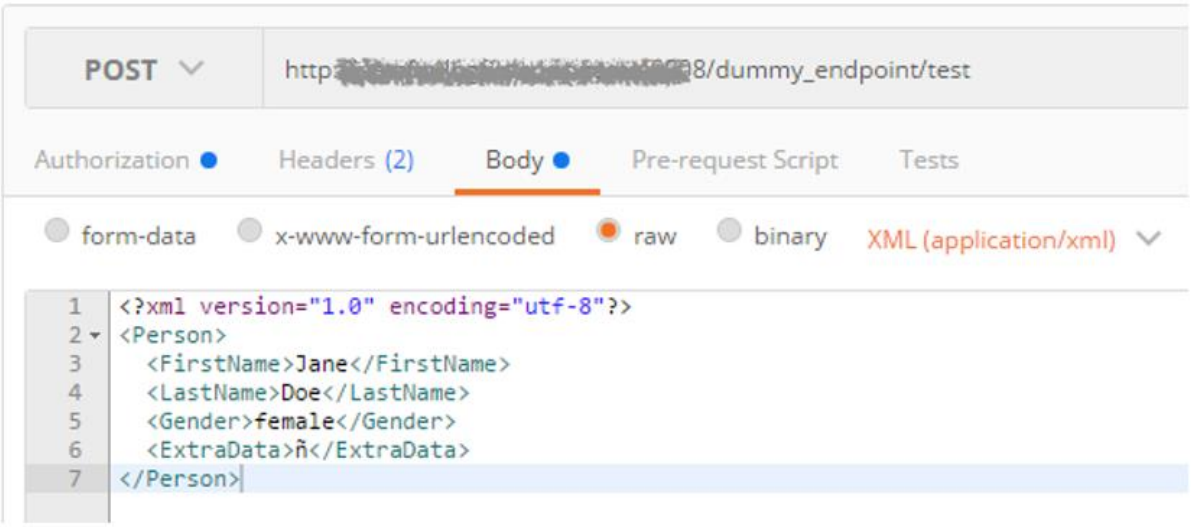
Request Example (XML)

In this example, we will have the same setup as the previous one except that instead of key-value data, we will be sending the XML message:

```
<Person>
 <FirstName>Jane</FirstName>
 <LastName>Doe</LastName>
 <Gender>female</Gender>
 <ExtraData>ñ</ExtraData>
</Person>
```

Using the POSTman Google Chrome extension, the following HTTP request was created:





You can see from the screenshots that we have:

1. A request verb of POST
2. A URI (URL) of http://xxxxxxxxxxxxxxxxx/dummy_endpoint/test
3. An Authorization header (I had put in a username/password and POSTman encrypted it for me)
4. A Content-Type header of "application/xml", which tells us that the data in the request body will be XML
5. An XML message in the request body

When we convert this request from the POSTman UI to HTTP:

1. It tells HTTP that we want to POST a request to the host xxxxxxxxxxxxxxx for resource /dummy_endpoint/test using HTTP version 1.1
2. It also shows that we have the request headers Authorization, Cache-Control, Postman-Token, and Content-Type
    - You don't need to worry about Cache-Control or Postman-Token
3. It is shows the request body XML data

        - The XML has been encoded for transmission since characters like "<" and ">" are illegal for HTTP

Notice that the data is the same as before, just represented in an XML format that was made up for this example.

This is done to show that the same data can be passed via many different methods and formats using web services.

What's most important is that the two communicating system agree on these details up front so that each system knows what to expect.

HOW-TO get started with Cloud WMS Web Services

This how to guide describes the basic steps necessary to get setup so as to use Cloud WMS Web Services

- Login to a Cloud WMS environment with an ADMIN Role user
- Open the Group Configuration screen and create a group with no UI or RF menus
    - In the entry field at the top start typing in Group
- Select the group, click the permissions button and in the drilldown screen, select can_run_ws_stage_interface permission and save it
- Open the users screen and copy your user (using the duplicate button which is the button next to the one with the plus sign on the right) and make the following change before saving it:
    - Change the Login
    - Change the Role from ADMIN to Employee
    - Enter a Password and note it down
    - Change the employee number
    - Change the first and last name
- Use Postman to create a request using the technical notes section and try to post using this new userid and password
    - Use asynch=True so that you will get any functional validation errors back
- Open the relevant screen (such as Purchase Order if you're uploading PO's) to check if it loaded
- If not, open the input interface screen and select purchase order to see if there are any errors listed