Introduction

The Global Data Synchronization Network (GDSN) is an internet-based, interconnected network of interoperable data pools and a global registry that enable companies around the globe to exchange standardized and synchronized supply chain data with their trading partners. It assures that data exchanged between trading partners is accurate and compliant with universally supported standards.

GDSN is built around the GS1 Global Registry, GDSN-Certified Data Pools, the GS1 Data Quality Framework, and GS1 Global Product Classification, when combined provide a powerful environment for secure and continuous synchronization of accurate data. Trade items are identified using the GS1 Identification Key called Global Trade Item Numbers (GTIN). Partners and locations are identified by the GS1 Identification Key called Global Location Numbers (GLN). A combination of GTIN, GLN and Target Markets (the geographical area where the catalogue item is intended to be sold) allows information to be shared in the Network.

GDSN allows trading partners to share the latest information in their systems. Any changes made to one company’s database can be automatically and immediately provided to all of the other companies who subscribe to the data through GDSN. When a supplier and a customer know they are looking at the same accurate and up-to-date data, it is smoother, quicker and less expensive for them to do business together. The GDSN provides a single point of truth for product information.

This document provides information on the setup and the activities that are related to synchronizing item data from a business entity that are participating in a GDSN framework.
## Terms and Definitions

<table>
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<th>Term</th>
<th>Definition</th>
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<td><strong>1. Acknowledgement Message</strong></td>
<td>In the global data synchronization process, this is an Extensible Markup Language (XML) response to a command returned to the originator. In GDSN, acknowledgement messages are standardized and may contain the following information: confirmation of message receipt, success/failure of processing for syntax and content or reason code for each type of failure.</td>
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| **2. CIC (Catalogue Item Confirmation)** | A message standard that refers to electronic communication from the Data Recipient to the Data Source, indicating what action has been taken by the Data Recipient on the item. Confirmation is not mandatory. When used, it provides for the following outcomes:  
  - **Synchronized**: data is integrated, in synch and added to the synchronization list.  
  - **Accepted**: Data has been received by the Recipient, but no business decision has been made on the data.  
  - **Rejected**: data will no longer be synchronized or updates will no longer be provided.  
  - **Review**: a request to the data source to “review” their data because the data recipient has received discrepant data, which they cannot synchronize. |
| **3. CIS (Catalogue Item Subscription)** | A business message used by the Data Recipient to establish a request for trade item information. The subscription criteria can be any combination of the GTIN, GLN, Target Market and GPC. The Recipient Data Pool will forward the CIS to the GS1 Global Registry. The GS1 Global Registry will forward the CIS to one or more Source Data Pools that have at least one item that matches the subscription criteria. |
| **4. CIN (Catalogue Item Notification)** | A business message used to transmit new or updated trade item information from a Source Data Pool to a Recipient Data Pool and further to the Data Recipient within the Global Data Synchronization Network. |
| **5. RFCIN (Request For Catalogue Item Notification)** | The RFCIN allows a Recipient to request data from the Source after synchronization has taken place, as well as to allow the retailer to undo a CIC REJECTED. |
GDSN Solution Framework:

Solution Component in Detail:

Solution Components – Subscription (CIS/CIS-R)
**Prerequisites and Assumptions:**

1. Understanding of Fusion Application Architecture.
4. Infrastructure for XML transformations, required for modifying
   a. GDSN compliant Subscription & Confirmation payload received from PIM to a Data pool compliant format
   b. CIN messages received from the datapool to a PIM compliant format for importing items in to PIM.
   c. Scheduling and Sequencing of the messages received and sent to the datapool.
   d. EFF and valuesets, Catalog Category setups that maps to the GDSN Attributes, extensions and GPC.
5. Rejection and Review Codes for the Confirmation messages.
6. Item Batches for importing item data.

**Composites and Services:**

Customers have to implement a mechanism to query subscription payload and confirmation payload from PIM Data Hub by implementing interfaces per specified WSDL. This payload consists of all the necessary details that are needed to be sent to a GDSN data pool.

1. RequestSubscription: Customers have to implement a service per ItemDataSyncCreateSubscription.wsdl. Subscription payload can be queried from PIM by implementing interfaces that implement this abstract WSDL.
2. RequestConfirmation: Customers have to implement a service per ItemDataSyncConfirmation.wsdl. Confirmation payload can be queried from PIM by implementing interfaces that implement this abstract WSDL.

Customers can use the following services provided for updating data in to PIMDH. Each of the services is explained below. The necessary xsds are provided in the appendix.

**EgiItemImportDataSyncInboundComposite:** - This composite consists of the following services.

1. ItemDataNotificationListService - This service is used to update Item Interface records with Item data coming from the data pool using the batch already created by the user.(CIN)
2. ItemSubscriptionResponseService – This service is used to update the subscription for the response received from the datapool(CIS - R)
3. ItemDataSyncConfirmationResponseService - Update Confirmation response received from the Data pool in the PIM Data Hub. (CIC - R)

Pls follow the below steps to view the details associated with the above composite services in OER.
Login to OER with appropriate credentials.  
Search for the above services and view the list of operations supported. Also view the list of input parameters and the description. You can also download the documentation that provides the complete details for these composites.

The following are the steps that need to be performed.

Setup Tasks:

1. Metadata Library - Valuesets, EFFs mapping to GDSN Attributes and extensions.
2. GPC, Target Market, GLN Setup.
3. Rejection and Review codes in FSM.
4. Setup a Data Pool enabled Spoke System.
5. Update Webservice URL and context root in FSM.

Setup Task Details:

1. Metadata Library- EFF Attribute Setup:
   Attributes available as a item data in the GDSN ecosystem must be setup as either a operational attribute or a EFF attribute. This EFF attribute can be setup at either Item, Item Revision or Item Supplier Address Org level in Fusion PIM. These attributes must also be having the appropriate valuesets, values, attribute type etc. This is needed to provide the item attribute values, item revision attribute values, item supplier attribute values (Item attribute values at all data levels) while importing the transformed CIN item data.

2. GPC, Target Market and GLN Setup:
   a. GPC- Catalog Categories that are equivalent to the GPC category has to be setup in the Fusion Catalogs. Use the Manage Catalogs setup tasks to create Item Catalogs and Categories that closely aligns with GPC based on your needs. A clean, clear mapping of the GPC catalog categories in PIM will result in increased productivity and less data errors. This mapping has to be stored separately and must be made available for consumption when the notification from a datapool is transformed and passed as a payload to the webservice in PIM. This will ensure that an item is assigned to the correct catalog and category.
   b. Target Market- Target Market from the GDSN ecosystem have to mapped to organizations in Fusion. For a GDSN solution to work seamlessly, we recommend a virtual master org in Fusion. Child organization in Fusion can be mapped to target markets in GDSN ecosystem. This will also help in the corresponding item attribute setups when certain attributes have to be set up as master org controlled and some as child org control.
   c. GLN: GLN corresponding to a supplier address must be setup in the Fusion System. This can be setup in the Supplier Address under Supplier Work Area. GLN is not
exposed by default in the Supplier Address page. Customers have to expose the GLN to be visible using admin personalization framework via web composer.

3. Rejection and Review Codes:

Rejection and Review codes are to be used as a part of Response to a CIN if the item data has errors. Some of the codes are seeded and customers can extend the codes. Manage Review Codes setup task has to be used to extend the lookup codes. Manage Rejection Codes setup task can be used to extend the rejection codes. You can choose one of these codes that will be sent to the datapool when a confirmation Review or Confirmation Rejection is sent to the data pool.

![Figure: Manage Review Codes](image1)

![Figure: Manage Rejection Codes](image2)

4. Setup a Data Pool enabled Spoke System:
Manage Source System entities setup task has to be used to create a Spoke System enabled for Items.

Use the Manage Spoke System setup task and edit the newly created spoke system in the above step and set the category to Data pool. Also based on the requirements setup the appropriate import options and save. This is the spoke system that will be used for the creation of a batch through which the item data is imported.

![Data Pool Enabled Spoke System](image)

**Figure: Data Pool Enabled Spoke System**

**Transactional Flow Steps:**
1. Create subscription and submit.
2. Listen for the business event and query the subscription payload using a service.
3. Transform this payload and submit to datapool.
4. Update the Subscription in PIM using the ItemSubscriptionResponseService provided by PIM.
5. Item Batch Creation – Manually or using a service.
6. Transform the CIN data.
7. Pass the transformed item data in to PIM using the ItemDataNotificationListService.
8. Take appropriate action in the Import Workbench.
9. Listen to the business event and query the confirmation payload using a service.
10. Transform this payload and submit to data pool.
11. Update the Confirmation in PIM using ItemDataSyncConfirmationResponseService provided by PIM.

**Transactional Flow Details**
1. Create subscription and submit.
With the setup of a subscription, a data recipient sets a profile to receive ongoing updates of the matching data – including all levels of the hierarchy. Subscription can be deleted from a data pool that results in stopping of reception of matching data from the data pool.

Subscription consists of one or more of the following criteria.

- Global Trade Identification Number (GITN)
- Global Location Number (GLN)
- GPC Category (GPC)
- Target Market (T.M)

You can create subscriptions based on one of the above parameters as explained above. Subscription has to have a name and Mode indicating whether it’s a one time subscription (equivalent to RFCIN) or recurring (equivalent to CIS) is create and then submitted to the data pool. Once a subscription is created and submitted, a corresponding payload is generated that has the necessary details to generate a CIS/RFCIN message.

2. Query Subscription Payload:

Submission triggers a business event and the subscription payload consisting of all the details that is needed to submit a CIS/RFCIN has to be queried using a service. Customers need to implement a webservice per a pre-specified WSDL to query the subscription payload. This payload further has to be transformed in to a data pool compliant format. After transformation the message can be further submitted to a GDSN compliant data pool via B2B messaging gateway.
Refer example of a service listed in the appendix - ItemDataSyncSubscriptionService that can be used as a reference.

3. Transform this payload and submit to datapool: Customers have to build this infrastructure for transforming the payload and submitting to the datapool via customer B2B message gateway.

4. Update Subscription Response:
   Response for a subscription that is submitted to the datapool can be received from the data pool. It can be success or failure (error with appropriate details). This response can be further processed and ItemSubscriptionResponseService be used to update the subscription in PIM. This will enable our customers to get a comprehensive view of the subscriptions that were created in Fusion, submitted to data pool via B2B messaging gateway and the response for the subscription all in a single UI instead of looking at various places/UIs.

5. Item Batch Creation – Manually or using a service.
   Create a batch by providing necessary information. Note down the Batch Number. This will be used as an input in the notification payload that is used to update the interface tables.

   ![Create Item Batch]
   Figure:Create Batch

   Item Batches can be created using a service too. Customers can use ItemBatchMaintenanceService to create a batch with appropriate options loaded.

6. Receive CIN data, Process and Transform the item data: Customers have to build the necessary infrastructure to process the received CINs and transform the CIN data.

7. Import Transformed data into PIM:
Use ItemDataNotificationListService for importing the item data. This accepts the batch name, Subscription number and a item hierarchy list as input parameters. The Hierarchy list is the list of items present in a pack along with the complete item data – Attributes, Categories, Pack components etc.

8. **Take appropriate action in the Import Workbench:**

Once this item data is imported into Import workbench, users can query the batch and view all the item details in the import workbench UI. Based on the business validations and the import options, the item data can be imported into production or can be routed via change order. Customers can take the action of rejecting a pack. They can also set the items to “Review” by providing appropriate reasons. If one or more of the item belonging to a pack fails any validations, the complete pack will be errored. Such errors can be captured using Rejection and Review Codes. Customers can send the rejection and review details to the suppliers via data pool.

- View all the items in the import workbench UI.

![Import Workbench UI](image)

**Figure: Import Workbench UI**

- Provide the necessary Rejection/Review Codes for all the items belonging to a pack hierarchy.
9. Query confirmation payload.

Sending message triggers a business event. The confirmation payload consists of all the details that is needed to submit a CIC to a GDSN data pool can be queried via service. Customers need to implement a webservices per a pre-specified WSDL to query the confirmation payload. This payload further has to be transformed in to a data pool compliant format. After transformation the message can be further submitted to a GDSN compliant data pool via B2B messaging gateway. Refer example of a service listed in the appendix - ItemDataSyncConfirmationService that can be used a reference.

10. Transform confirmation payload and submit to data pool.: Customers have to build this infrastructure for transforming the Confirmation payload and submitting to the datapool via customer B2B message gateway.
11. Update the Confirmation Response in PIM:

Response for a Confirmation message that is submitted to the datapool can be received from the data pool. It can be success or failure (error with appropriate details). This response can be further processed and `ItemDataSyncConfirmationResponseService` be used to update the confirmation message with the result. This will enable our customers to get a comprehensive view of the confirmation that were created in Fusion, submitted to data pool via B2B messaging gateway and the response for the confirmation - all in a single UI instead of looking at various places/UIs.

**Manual Validation:**

The following manual steps can be performed to ensure that the transformed payload is getting imported correctly. Once the payload is available, it can be uploaded from Enterprise Manager-Enterprise Manager

1. Login to SCMDomian Enterprise Manager (EM).
2. Expand SOA node

![Figure: SOA composite](image-url)
3. Scroll down and select **EgiItemImportDataSyncInboundComposite**

![Image of ImportDataSync Composite](image)

Figure: ImportDataSync Composite

4. On the right-hand **Composite Details** region, select the Test Menu and add find the **ItemDataNotificationListService**

![Image of Select ItemDataNotificationListService](image)

Figure: Select ItemDataNotificationListService
5. Under the **Security** Tab, Select the **OWSM Security Policies** radio button. From the listed Compatible Client Policies, select the `saml_token_with_message_protection_policy`.

![Configuration properties](image1.png)

**Figure : Select compatible client security policy.**

6. Under the Configuration properties, provide the appropriate user name and password. Also provide the Keystore location and Keystore password appropriately. Click on the Load Keys button.

![Configuration properties](image2.png)

**Figure : Configuration properties.**

7. Click on the **Advance Options** checkbox. Select the **Signature Key Alias** (orakey) and provide the **Signature Key Password**.

![Advance Options Region](image3.png)

**Figure : Advance Options Region.**

8. Under the Input Arguments, select XML view and provide the payload that was created.
9. Click on the **Test Web Service** button to start the processing.

10. Click on the **Launch Flow Trace** button to view the processing requests.
11. See that all the process gets completed.

12. Verify the batch details in the PIM Data Hub and see that the appropriate data visible.

Summary

Item data from a GDSN ecosystem can easily be received and processed in Fuion PIM system. Item data, Pack hierarchy and the item attributes at all levels can be easily imported. The inherent constraint in a GDSN system of importing All or None items is integrated in the Import Workbench.
Appendix:

A. ItemDataSyncCreateSubscription.wsdl
B. ItemDataSyncConfirmation.wsdl

ItemDataSyncCreateSubscription.wsdl:

```xml
<?xml version='1.0' encoding='UTF-8'?>
<wsdl:definitions
xmlns:ns1="http://xmlns.oracle.com/apps/scm/productHub/itemImport/subscriptions/subscriptionService/"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/
xmlns:client="http://xmlns.oracle.com/apps/scm/productHub/itemImport/EgiItemImportDataSyncExternalComposite"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
name="ItemDataSyncCreateSubscription"
targetNamespace="http://xmlns.oracle.com/apps/scm/productHub/itemImport/EgiItemImportDataSyncExternalComposite">
<wsdl:documentation>
    <name>Item Data Sync Create Subscription Service</name>
    <docCategories>
        <category>None</category>
    </docCategories>
</wsdl:documentation>
<plnk:partnerLinkType name="ItemDataSyncCreateSubscription">
    <plnk:role name="ItemDataSyncCreateSubscriptionProvider">
        <plnk:portType name="client:ItemDataSyncCreateSubscription"/>
    </plnk:role>
    <plnk:role name="ItemDataSyncCreateSubscriptionRequester">
        <plnk:portType name="client:ItemDataSyncCreateSubscriptionCallback"/>
    </plnk:role>
</plnk:partnerLinkType>
<wsdl:types>
    <schema
xmlns:ns1="http://xmlns.oracle.com/apps/scm/productHub/itemImport/dataPoolSynchronizationService/"
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/
xmlns:client="http://xmlns.oracle.com/apps/scm/productHub/itemImport/EgiItemImportDataSyncExternalComposite"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"/>
<import
</schema>
</wsdl:types>
</wsdl:definitions>
```

```xml
</ItemDataSyncCreateSubscription.wsdl>
```
ItemDataSyncConfirmation.wsdl

<?xml version='1.0' encoding='UTF-8'?>
<wsdl:definitions xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/
xmlns:client="http://xmlns.oracle.com/apps/scm/productHub/itemImport/EgiItemImportDataSyncExternalComposite"
xmlns:nsl="http://xmlns.oracle.com/apps/scm/productHub/itemImport/subscriptions/subscriptionService/
xmlns:plnk="http://schemas.xmlsoap.org/ws/2003/05/partner-link/
name="ItemDataSyncConfirmation"
targetNamespace="http://xmlns.oracle.com/apps/scm/productHub/itemImport/EgiItemImportDataSyncExternalComposite"
<wsdl:documentation>
  <name>Item Data Sync Confirmation Service</name>
  <docCategories>
    <category>None</category>
  </docCategories>
</wsdl:documentation>
<wsdl:types>
  <schema xmlns="http://www.w3.org/2001/XMLSchema">
    "http://schemas.xmlsoap.org/wsdl/">
    <import
  nameSpace="http://xmlns.oracle.com/apps/scm/productHub/itemImport/EgiItemImportDataSyncExternalComposite"
schemaLocation="xsd/CreateSubscriptionResponse.xsd"></import>
  </schema>
</wsdl:types>
<wsdl:message name="ItemDataSyncCreateSubscriptionRequestMessage">
  <wsdl:part name="payload" element="nsl:subscriptionResult"></wsdl:part>
</wsdl:message>
<wsdl:message name="ItemDataSyncCreateSubscriptionResponseMessage">
  <wsdl:part name="payload" element="nsl:subscriptionResult"></wsdl:part>
</wsdl:message>
<wsdl:portType name="ItemDataSyncCreateSubscriptionCallback">
  <wsdl:operation name="processSubscriptionResponse">
    <wsdl:input
  message="client:ItemDataSyncCreateSubscriptionResponseMessage"></wsdl:input>
</wsdl:operation>
</wsdl:portType>
<wsdl:portType name="ItemDataSyncCreateSubscription">
  <wsdl:operation name="processSubscription">
    <wsdl:input
  message="client:ItemDataSyncCreateSubscriptionRequestMessage"></wsdl:input>
</wsdl:operation>
</wsdl:portType>
</wsdl:definitions>
infra/services/default/EgiItemImportDataSyncExternalComposite/apps/oracle/apps/scm/productHub/itemImport/subscriptions/subscriptionService/Confirmation.xsd"/>
</import>
</schema>
<wsdl:types>
<wsdl:message name="ItemDataSyncConfirmationRequestMessage">
  <wsdl:part name="payload" element="ns1:confirmationResult"/>
</wsdl:message>
<wsdl:message name="ItemDataSyncConfirmationResponseMessage">
  <wsdl:part name="payload" element="ns1:confirmationResult"/>
</wsdl:message>
<wsdl:message name="ItemDataSyncConfirmation">
  <wsdl:operation name="processConfirmation">
    <wsdl:input message="client:ItemDataSyncConfirmationRequestMessage"/>
  </wsdl:operation>
  <wsdl:message name="ItemDataSyncConfirmationResponseMessage">
    <wsdl:operation name="processConfirmationResponse">
      <wsdl:input message="client:ItemDataSyncConfirmationResponseMessage"/>
    </wsdl:operation>
  </wsdl:message>
</wsdl:portType>
<plnk:partnerLinkType name="ItemDataSyncConfirmation">
  <plnk:role name="ItemDataSyncConfirmationProvider">
    <plnk:portType name="client:ItemDataSyncConfirmation"/>
    <plnk:role name="ItemDataSyncConfirmationRequester">
      <plnk:portType name="client:ItemDataSyncConfirmationCallback"/>
    </plnk:role>
  </plnk:role>
  <plnk:role name="ItemDataSyncConfirmationRequester">
    <plnk:portType name="client:ItemDataSyncConfirmationCallback"/>
  </plnk:role>
</plnk:partnerLinkType>
</wsdl:definitions>
Implementing GDSN with Fusion
August 2014

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.
Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200
oracle.com

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