Machine to Machine Communication for the 1WorldSync, by Syndigo - DSE Data Pool

Author: Dennis Van den Abbeel
Department: Product Management
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1. Introduction

1.1. About 1WorldSync, by Syndigo

1WorldSync by Syndigo is a leading platform for product content. It enables over 18,000 brands and more than 3,500 retailers across 60+ countries to share accurate product information with their partners and consumers.

With the addition of expert services, 1WorldSync by Syndigo offers a complete solution for ensuring transparency, compliance, and successful cross-channel commerce.

1.2. General note

This document contains two different signs, which point the reader to important issues:

Check

The check sign sections in this document contain important information for Data Senders (DS) and Data Recipients (DR) on special impacts which both users must consider by using this document.

Exclamation Mark

The exclamation points sections in this document contain special issues which must be considered while reading this document. Sometimes background information to special services, which 1WorldSync, by Syndigo will provide for their customers, will be part of this section as well.

This document describes the processes and technical specifications concerning the message handling between **DSE Data Pool** and the customers as well as **DSE Data Pool** and the GDSN. It offers an overview of prerequisites, including technical connectivity, message types and communication channels. The document also describes several customer specific processes implemented by 1WorldSync, by Syndigo.

Please note this document only refers to the DSE Data Pool (DSE – Data Sync Engine) formerly known as 1WorldSync EU / atrify

1.3. DSE Data Pool

Our DSE Data Pool is the central engine, that connects all customer facing systems (Publishing & Approval) and Machine to Machine (M2M) connected users with each other and additionally provides a bridge to the GDS Network. DSE Data Pool is a GDSN certified Data Pool on version BMS 3.1 connected to 45+ GDSN data pools worldwide.[1]

[1] See https://www.gs1.org/services/gdsn/certified-data-pools-list for the list of GDSN certified Data Pools

The following picture describes the specifics of the DSE Data Pool which is based on the GDSN standard.

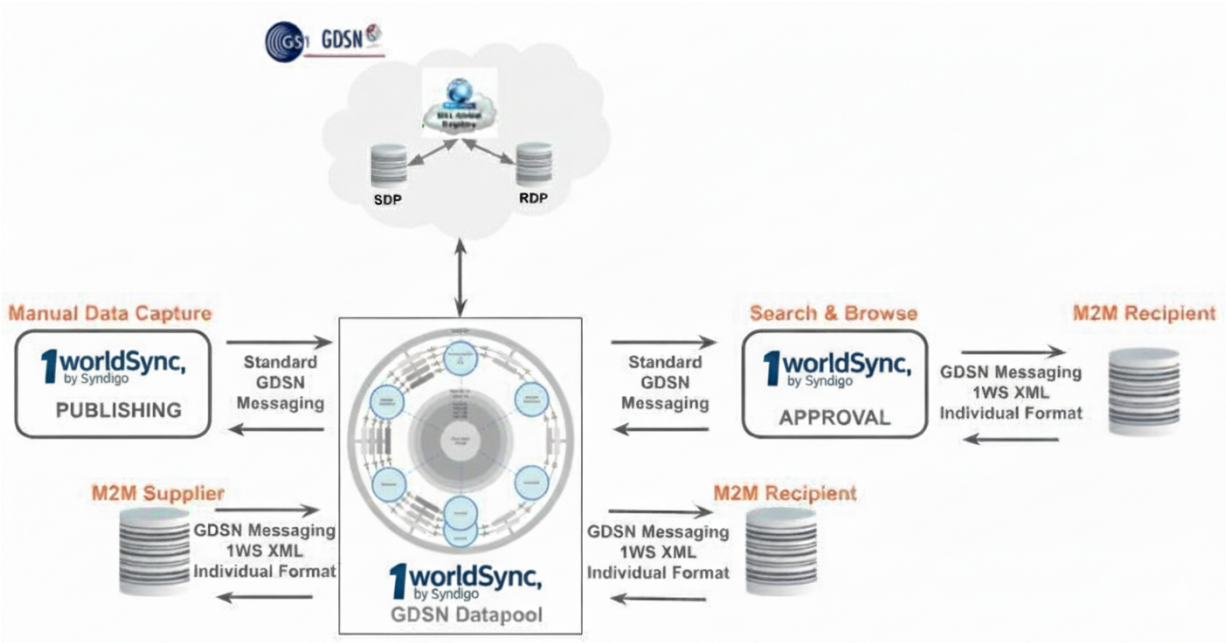


Figure 1: Pool architecture and message choreography for an item published to target market

DSE Data Pool uses standard GDSN messages to interact with all GDSN parties. The communication type used can be either AS2 or a simple file sharing connection depending on the location of each application.

Applications connected to DSE Data Pool acts as messaging (M2M) suppliers or retailers in terms of maintaining and retrieving data.

Messaging (M2M) customers are connected directly to DSE Data Pool with the option to use our applications (Publishing, Approval) in a hybrid mode.

1.4. Contacts and support

For all questions regarding message exchange please contact the 1WorldSync, by Syndigo Global support team.

Website: https://1worldsync.com/

DSE data pool URL:

- Production:
  - https://datasync-prod.atrify.com
- Pre-Production:
  - https://datasync-test.atrify.com

Download Center:

- https://kundenbereich.1worldsync.com/kundenbereich/download-center/

Contact details for support:
Please follow https://1worldsync.com/de/kontakt/ to get the contact details to reach out to the 1WorldSync, by Syndigo support team globally.

For M2M customers requiring technical support, contact servicedesk@1worldsync.atlassian.net.

1.5. GS1 Global – Sources

GS1 Global – the source of the GDSN standard – offers plenty of documents for the implementation. Consider at least the following documents & sources:

- GDSN Schema files
- Trade Item Implementation Guideline
- Product Image Specification
- Information on GPC
- GS1 GDSN Release Schedule

Those resources are relevant for all M2M customers that do not use a 1WorldSync, by Syndigo PIM solution. The provided information enables the M2M customers to have their PIM / MDM to interact with a GDSN Data Pool.

If a customer uses a PIM, MDM, or other middleware to connect to the GDSN, they are responsible for staying current with all GDSN releases. They must review each release to determine if the changes are relevant to their specific business. For example, a healthcare customer would not be affected by changes in the food sector and vice versa.

2. GDSN Basics

GDSN is the Global Data Synchronization Network® managed by GS1 and GDSN Inc., which connects trading partners to the GS1 Global Registry® via a world-wide network of interoperable GDSN-certified Data Pools like the DSE Data Pool, Item Management and Syndigo Data Pool.

The GDSN concept essentially is a set of strict rules defining the communication between the pools. Within the network a commonly agreed message format and message choreography is used.

The GS1 Data Quality Framework and the GS1 Global Product Classification (GPC) forms a powerful environment for secure and continuous synchronization of good quality item data on the GDSN platform. Changes made to one company's database can automatically be sent to all trading partners who do business with them, so all have the same information in their systems.

GDSN certified DSE Data Pool makes it easy to globally synchronize item data, since almost any data content in DSE Data Pool is automatically transformed to GDSN compliant data. Also, the appropriate messaging choreography within the network handled automatically, e.g. registration of master data at the global registry, publication of data to authorized data requesting recipients, as well as update and correction management are all part of the GDSN based Data Pool service provided by 1WorldSync, by Syndigo.

The current GDSN release version is BMS 3.1.x is the fundament for the whole message choreography.

2.1. GDSN party roles and functions

There are three types of actors in the GDSN, i.e. three roles:

- the Global Registry
- the Data Pools, split into two types:
  - Source and Recipient Data Pools,
- and the Trading Partners, who are the initiating actors of each transaction:
  - Data Supplier and Data Recipient.

The **Global Registry** is the central repository, where e.g. all item key information and all item subscriptions come together:

- Every catalogue item registered is identified through its triple key of GTIN, GLN and TM (Target Market), supplemented by its GPC (Global Product Classification), and linked to its registering Source Data Pool. Thus, the Global Registry knows on which GDSN pool the item master data is stored.
- Every request for item information (data inquiry, subscription) is stored at the Global Registry, and all registered items are filtered by the search criteria defined in it (GTIN, GLN, TM and GPC). If there are items that match the search criteria, the subscription is forwarded to the Source Data Pool, where these items are stored.

A Source Data Pool

- registers the items of the Data Suppliers at the Global Registry,
- maintains, validates and stores the complete item master data,
- receives, stores and executes the data inquiries (subscriptions) received,
- executes the data filtering and forwards the master data of published and subscribed items (Pub-Sub match) to the Recipient Data Pools of the subscribing retailers.

A Recipient Data Pool

- manages the reception and forwarding of the data inquiries (subscriptions) from retail side,
- manages the reception and the forwarding of the received item master data to the data inquiring recipients,
- manages the reception and the forwarding of the responses/confirmations of the retailers (= Data Recipients) to the Source Data Pools of the data suppliers.

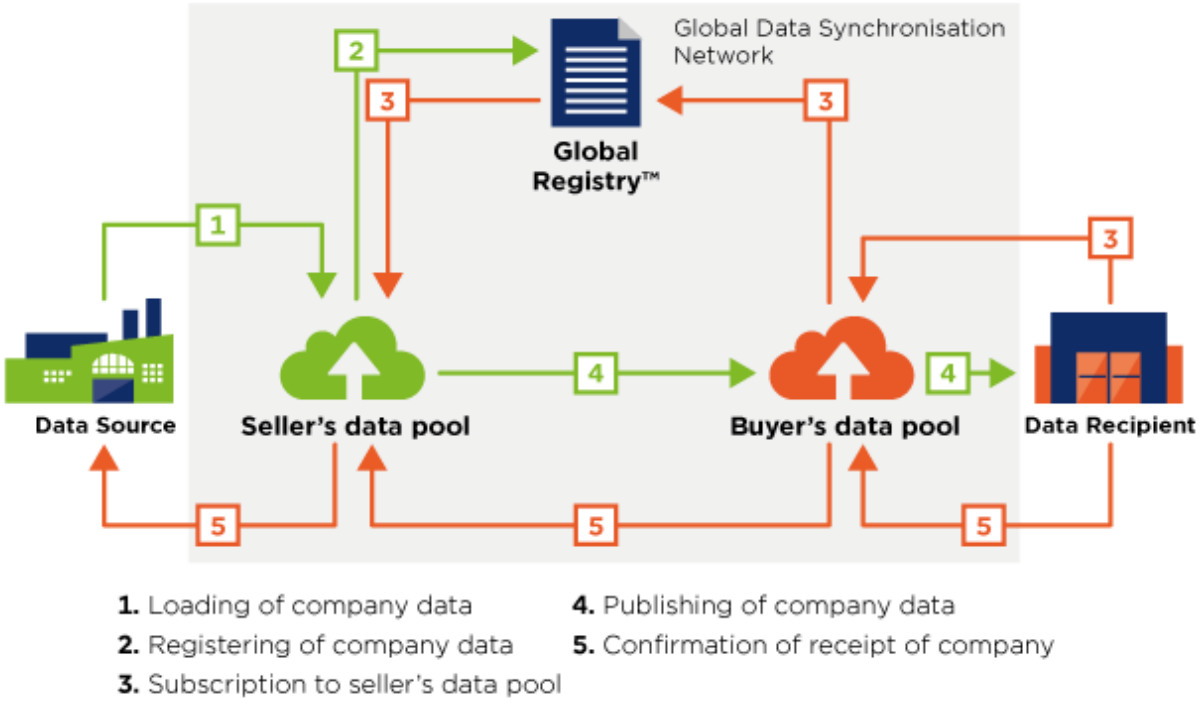


Figure 3: GDSN party roles and functions

Basically, there are five steps to synchronize item data successfully via GDSN:

1 Load data: the seller (Data Supplier) registers and loads product and company data for data maintenance in his Data Pool (Source Data Pool).

2 Register data: The Data Pool registers the items with the GS1 Global Registry.

3 Request data: the buyer (Data Recipient), through his Recipient Data Pool and the Global Registry, subscribes to receive a seller's product data (initial load and ongoing updates).

4 Publish data: the manufacturer (Data Supplier) publishes his data in his Source Data Pool to certain buyers. When published, the Source Data Pool sends the data to the Recipient Data Pool of the buyer (Data Recipient), who has requested (subscribed) the data.

5 Confirm & inform: the buyer (Data Recipient) can return a confirmation (CIC) to the seller (Data Supplier) - via both data pools - to inform him about the action he has taken, i.e. whether he has received, synchronized or rejected the data, or is demanding a data review. In the latter case the seller may adjust the contents for him.

2.2. GDSN message choreography

Within the GDSN the message choreography described below is used. All these messages have the defined GDSN XML message format.

The following **abbreviations** (e.g. CIN, CIS, CIP, CIC, etc.) are used in further graphics and in the document text.

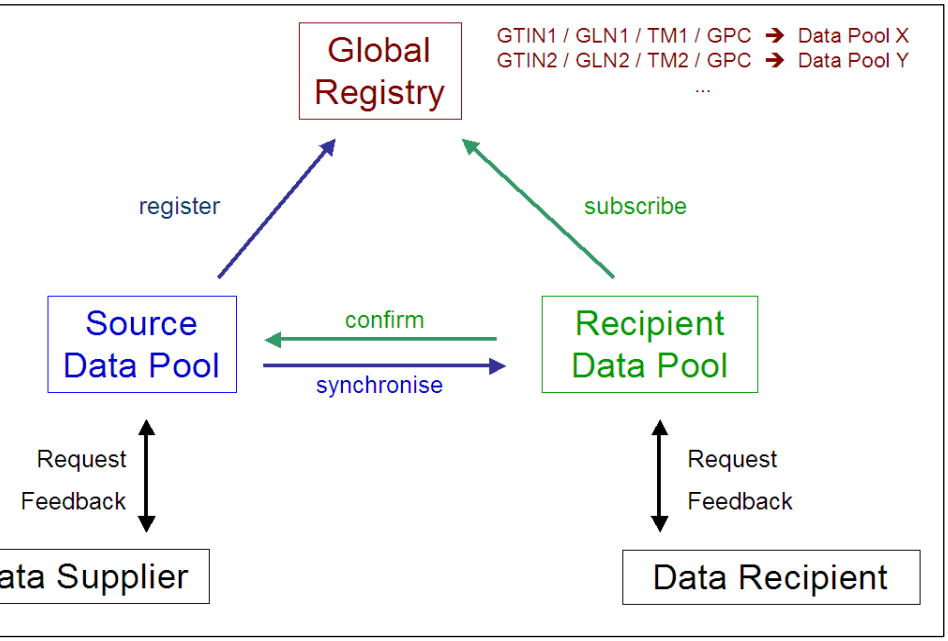


Figure 4: GDSN message triangle

The **registration message** (**RCI, Register Catalogue Item**) is a message type sent from the Source Data Pool to the Global Registry containing (GTIN, GLN and TM) plus the GPC. The registering Source Data Pool GLN is also linked to that entry.

The **publication message (CIP, Catalogue Item Publication**) is stored on the Source Data Pool and – if a matching subscription exists - initiates the export of the item data and sends it to the data recipient's system.

The **subscription message** (**CIS, Catalogue Item Subscription**) contains the filter criteria of a 'permanent' data inquiry and is sent by the Data Recipient to the Global Registry by the Recipient Data Pool. The Global Registry forwards the subscription (including the requesting

recipient's link) to the Source Data Pool of the items that match the filter criteria. If a publication exists, the data is exported and sent towards the recipient's system.

A **Request for Catalogue Item Notification** (**RFCIN)** message is a one-time inquiry of item data (specified by filter criteria contained) that is already in the synchronization list of the data pool, thus has been synchronized with the Data Recipient already before, but is now needed again. An RFCIN can also be used to request data that was already rejected before (CIC-REJECT). Other than the CIS message, this data inquiry is sent to the Source Data Pool via the Global Registry, but is not stored there, but is executed only once and then discarded. This means, that only a "reload" (without data rejected before) or an "initial load" (including data rejected before) is delivered, but no ongoing data updates.

In case of a PUB-SUB match (= publication matches subscription) at the Source Data Pool the complete catalogue item master data is directly sent to the Recipient Data Pool as a notification message (**CIN, Catalogue Item Notification**). The Recipient Data Pool forwards it to the subscribing Data Recipient.

When a data recipient receives information, they can send a **Catalogue Item Confirmation (CIC)** message back to the data supplier. This message, which travels through the respective data pools, provides a clear status update on the data.

The recipient can use this message to communicate one of the following statuses:

- **CIC-RECEIVED:** The data has been successfully received.
- **CIC-SYNCHRONIZED:** The data has been accepted / synchronized with the recipient's system.
- **CIC-REJECT:** The data has been rejected with a given reason (optional)
- **CIC-REVIEW:** The recipient is requesting a data review to have it updated / corrected

GS1 Response messages are sent out as an acknowledgement of receipt for transactions (message contents) that have been received and processed successfully. In this case the GS1 Response message will contain a <gS1Response> tag with *<responseStatusCode>ACCEPTED</responseStatusCode>* will be sent to the Data Supplier.

GDSN Response messages are also sent out, when GDSN errors have occurred while transactions have been processed (GDSN validation report). In this case the GS1 Response message will contain a <gS1Exception> tag having sub tags *<gS1Error> <errorCode> <errorDateTime> <errorDescription>* that will be sent to the Data Supplier.

2.3. Types of messages within the GDSN

Below is an overview of the most relevant types of messages within the triangle (see figure above):

Type of message	Purpose	Sent by	Sent to
BPR, Basic Party Registration	Registration of party data	Source Data Pool	Global Registry
RCI, Register Catalogue Item	Registration of item data	Source Data Pool	Global Registry
CIP, Catalogue Item Publication	Publication of items to target market or retailer(s)	Data Source	Source Data Pool
CIHW, Catalogue Item Hierarchy Withdrawal	Delete GLN Publication to items retailers. And also used for hierarchy link corrections. **Note:** Deleting target market Publication is not possible with CIHW (bad design in GDSN!) as CIHW XML schema does not support target market deletions. DSE Data Pool still allows to use the legacy CIP Delete for GLN and Target Market publications.	Data Source	Source Data Pool Recipient Data Pool / Data Recipient
CIS, Catalogue Item Subscription	Subscription of item data	Data Recipient Recipient Data Pool	Global Registry Source Data Pool
CIN, Catalogue Item Notification	Notification of item modification or new items	Data Source Source Data Pool	Source Data Pool Recipient Data Pool / Data Recipient
CIC, Catalogue Item Confirmation	Confirmation of items received	Data Recipient Recipient Data Pool	Recipient Data Pool Source Data Pool / Data Source
RFCIN, Request for Catalogue Item Notification	Request for data after synchronization has taken place	Data Recipient Recipient Data Pool Global Registry	Recipient Data Pool Global Registry Source Data Pool

Table 2: List of important messages

2.4. GDSN responses

There are four types of responses within the GDSN:

Type of response	Purpose	Sent by	In response to
GS1 Response (Type=Response)	Indicates that a transaction was performed successfully. Not a transaction itself, simply an indicator.	Data pool	CIN, CIP, CIHW, CIC, CIS
GS1 Response (Type=GS1 Error)	Indicates errors that occurred while transaction was being processed	Data pool	CIN, CIP, CIHW, CIC, CIS
Catalogue Item Registration Response	Indicates accepted of registration request	Global Registry	RCI
Party Registration Response	Indicates accepted of registration request	Global Registry	Basic Party Registration

Table 3: List of response messages

3. Technical connectivity

3.1. Prerequisites

1WorldSync, by Syndigo uses open Internet standards to exchange data with Trading Partners. In most cases, all you require is a certified Internet browser to the 1WorldSync, by Syndigo web applications (see chapter Browsers for details of supported browsers).

The trading partners are responsible for securing the following prior to exchanging data with DSE Data Pool:

Obtain appropriate hardware and messaging software than can:

- Send and receive messages over the Internet using AS2, https or sFTP
- Translate and convert messages from/into the GDSN XML message types
- Send and receive messages to and from your back-end systems
- Implement support for the required business data types in the messaging software
- Connect to 1WorldSync, by Syndigo using AS2 protocols/methods, https or sFTP
- Incorporate electronic messaging into your business processes and back-end systems
- Test connectivity with 1WorldSync, by Syndigo

3.1.1. Browsers

More advanced applications require the exchange of necessary data between 1WorldSync, by Syndigo and your back-end ERP systems.

1WorldSync, by Syndigo supports the most common browsers Google Chrome, Mozilla Firefox and Windows Internet Explorer 11. In principle the user should make sure to use the recent browser versions.

3.1.2. Firewall requirements

DSE Data Pool Integration Hub can connect to any IP address provided it is either:

- AS2 over port 80/443 – requires digital certificate authentication.
- sFTP over port 5000

AS2 over port 80/443 can be arranged on a case-by-case basis. This does not require implementation of additional firewall rules for each trading partner on DSE Data Pool side.

Especially, to send/receive transactions from DSE Data Pool, trading partners must configure their firewall(s) to allow/accept connections from/to the following 1WorldSync, by Syndigo IP addresses:

Environment	URL (http:// or https://)	IP Address
Pre-Production	as2-datasync-test.atrify.com/as2	89.202.73.19
Production	as2-datasync-prod.atrify.com/as2	89.202.73.35

DSE Data Pool accepts files in GDSN XML format. Please refer to your 1WorldSync, by Syndigo implementation documentation for details on the actual payload formats to assist in your back-end integration mapping.

Some of the response codes are listed below:

- 200 "OK" – Transaction completed successfully
- 400 "Bad request" – Error in request header or unrecognized content; this may mean that the format of the URL or request header information is not correct
- 401 "Unauthorized" – Authentication failure; this means that the User ID and/or password are invalid and, in rare cases, may indicate a problem with the HTTP/S server at the Exchange
- 404 "Not found" – Cannot find the specified URL
- 500 "Server error" – Indicates that the server is inoperative or is currently offline

3.2. Using EDIINT AS2

EDIINT stands for “Electronic Data Interchange-Internet Integration” or “EDI over the Internet”. EDIINT is a standard defined by the Internet Engineering Task Force (IETF) that defines a protocol for using the Internet to securely exchange business data (EDI, XML, or other). Please refer to http://www.ietf.org/html.charters/ediint-charter.html for general information on EDIINT.

There are two versions of the EDIINT standard:

- AS1 (SMTP based protocol)
- AS2 (HTTP or HTTP/S based protocol).

1WorldSync, by Syndigo only supports the EDIINT AS2 version in production at this time and uses technology that has successfully completed the Secure B2B INT AS2 Conformance Validation Test. The UCC (Uniform Code Council)-sponsored test was conducted by the Drummond Group to validate the ability of software vendors to interoperate with one another to communicate EDI data via the EDIINT AS2 standard. For more information on the interoperability test administered by the Drummond Group, please refer to http://www.drummondgroup.com. The following list outlines the primary feature specifications of the current production 1WorldSync, by Syndigo EDIINT AS2 implementation:

- Exclusively uses the S/MIME (Secure/Multipurpose Internet Mail Extensions) version 2 cryptographic format to package, encrypt, and provide a digital signature to outbound data and to unpack, decrypt, and verify the authenticity of inbound data.

- Uses SHA-1 hash algorithm to sign outbound messages and verifies inbound messages that were signed with either SHA-1 or MD5.
- Supports custom encryption type and key length settings per trading partner. The choices are: Triple DES, DES, RC2(40), RC2(68), and RC2 (128).
- Delivers outbound messages to trading partners as signed, encrypted, signed/encrypted, or plain text.
- 1WorldSync, by Syndigo AS2 sends receipt MDN messages back to the sending party if they are requested.
- 1WorldSync, by Syndigo AS2 requests MDN messages from trading partners upon successful receipt of the EDIINT AS2 message. Per default 1WorldSync, by Syndigo expects synchronous signed MDN receipts. But asynchronous MDNs are also supported.
- The payload Content-Type of the document depends on the transaction being sent or received. For most transactions, the Content-Type will be application/xml.
- Set number of retry to 1.

3.2.1. Sending GDSN XML to DSE Data Pool using EDIINT AS2

For inbound EDIINT AS2 transactions, DSE Data Pool supports either:

- HTTP/S over port 443, with Basic Authentication (User ID/ Password)

OR

- HTTP with S/MIME encryption over port 4080, without authentication, but controlled firewall-to-firewall access and digital certificate being exchanged. The detailed information can be taken out of the following table:

Information for immediate assistance regarding machine-to-machine (M2M) communication		
Technical Contact Email	connectivity@1worldsync.atlassian.net	
Technical Contact Telephone Number	+49 221 93373 -363 or -111	
AS2 Connection Parameters of 1WorldSync, by Syndigo (Production System)		
AS2 Protocol and Software		
AS2 Identifier (AS2-From)	4049111100007	
Used Software / Version	/n software inc. IP*Works! EDI AS2 Component 9.0.4729	
HTTP URL	http://as2-datasync-prod.atrify.com/as2	Use this URL in case you connect by HTTP
HTTP Port	80	Use this port in case you connect by HTTP
HTTPS URL	https://as2-datasync-prod.atrify.com/as2	Use this URL in case you connect by HTTPS
HTTPS Port	443	Use this port in case you connect by HTTPS
Security Issues		
Outbound IP	89.202.73.35	
Compression (Yes / No)	No	
Type of compression	./.	
Signature (Yes / No)	Yes	
MDN required (Yes / No)	Yes	

Type of Connection (Synchronous / Asynchronous)	Synchronous	
Document Encryption (Yes / No)	Yes	
Type of Encryption (Triple DES / RC2 / ARC4 / DES)	Triple DES	
Digital Communication Signature (SHA1 / MD5)	SHA1	
Name of Certificate	Example: as2-datasync-prod_atrify_com_2025_public.cer	
Certificate Expiration Date	Yearly renewal, customers will be informed via email	
AS2 Connection Parameters of 1WorldSync, by Syndigo (Test System)		
AS2 Protocol and Software		
AS2 Identifier (AS2-From)	4049111170017	
Used Software / Version	/n software inc. IP*Works! EDI AS2 Component 9.0.4729	
HTTP URL	http://as2-datasync-test.atrify.com/as2	Use this URL in case you connect by HTTP
HTTP Port	80	Use this port in case you connect by HTTP
HTTPS URL	https://as2-datasync-test.atrify.com/as2	Use this URL in case you connect by HTTPS
HTTPS Port	443	Use this port in case you connect by HTTPS
Security Issues		
Outbound IP	89.202.73.19	
Compression (Yes / No)	No	
Type of compression	./.	
Signature (Yes / No)	Yes	
MDN required (Yes / No)	Yes	
Type of Connection (Synchronous / Asynchronous)	Synchronous	
Document Encryption (Yes / No)	Yes	
Type of Encryption (Triple DES / RC2 / ARC4 / DES)	Triple DES	
Digital Communication Signature (SHA1 / MD5)	SHA1	
Name of Certificate	Example: as2-datasync-test_atrify_com_2025_public.cer	
Certificate Expiration Date	Yearly renewal, customers will be informed via email	

Table 4: AS2 connectivity data

DSE Data Pool will respond with a synchronous signed MDN message upon successful receipt of the EDIINT message. If the MDN is not received, the partner should consider the message delivery failed. 1WorldSync, by Syndigo will provide the partner with its X.509 compliant public digital certificate to allow the partner to verify DSE Data Pool digital signature on the MDN message.

3.2.2. Receiving XML from DSE Data Pool Using EDIINT AS2

The payload stream will be signed and encrypted when delivered to the partner. DSE Data Pool will provide the partner with its X.509 compliant public digital certificate to allow partner to verify DSE Data Pool document signature. The partner must provide 1WorldSync, by Syndigo with their X.509 compliant digital certificate to allow DSE Data Pool to encrypt the message being sent to the partner.

The Content-Type setting should be:

- Content-Type=”application/xml”

A synchronous signed MDN message is expected by DSE Data Pool upon successful receipt of the EDIINT message. Otherwise, data delivery at the Exchange will be considered failed. The partner is required to provide an X.509 compliant public digital certificate to allow DSE Data Pool to verify the partner’s digital signature.

The partner must provide 1WorldSync, by Syndigo with a URL for sending messages to their interoperable EDIINT AS2 system.

3.2.3. AS2 authentication for outbound messages

AS2 Communication also provides basic authentication for outgoing messages on the HTTP/HTTPS-Layer. The software checks if the userid/password is specified as part of the AS2 URL, e.g. given the URL "http://james:secret@as2.customer.com:443/gateway", the userid is "james", and the password is "secret”.

Encryption and signature are options for AS2 Communication Channel.

3.3. Encoding

UTF-8 is an encoding of Unicode (more precisely, one of several possible encodings), which is optimized for using mostly Latin characters. (Please note, that there is a big difference between a character set like Unicode and its actual encoding, e.g. "UTF-8" etc. Within UTF-8 all Latin characters are encoded with a single byte. But obviously, not all 63487 Unicode codes can be encoded with a single byte. All non-Latin characters must be encoded with two, three or even four bytes.

3.3.1. Restrictions for Unicode

The following limitations for Unicode codes apply to the 1WorldSync, by Syndigo system:

Restrictions caused by the XML specification

The use of the following is prohibited:

All so called "C0 Controls", i.e. ASCII characters with code below 32, except the TAB (#x9), the LINE-FEED (#xA), and the
CARRIAGE-RETURN (#xD):

- #0 - #x8 (decimal: 0 - 8)

- #xB (decimal: 11)
- #xC (decimal: 12)
- #xE - #x1F (decimal: 14 - 31)

The "Surrogate Area"

The Unicode standard does not define any characters in this area and it never will, since these codes are reserved for use with UTF-16 encoding:

- #xD800 - #xDFFF (decimal: 55296 - 57343)

Codes #xFFFE and #xFFFF,

These are guaranteed not to be Unicode characters at all.

- #xFFFE, #xFFFF (decimal: 65534, 65535)

Beyond that, any Unicode characters can be used.

3.3.2. Non-printable characters

There are several codes defined by Unicode which denote non-printable characters. Some of them may be useful, assumed that the software involved knows how to deal with them, e.g. PARTIAL-LINE-FORWARD (#x8B) or REVERSE-LINE-FEED (#x8D).

But most of them won't be useful. Codes like SET-TRANSMIT-STATE (#x93) or DEVICE-CONTROL-STRING (#x90) should be avoided generally in textual data. Similarly, codes like PRIVATE-USE-ONE (#x91) [see http://www.fileformat.info/info/unicode/char/0091/index.htm] and PRIVATE-USE-TWO (#x92) [see http://www.fileformat.info/info/unicode/char/0092/index.htm] are obviously inappropriate for use with global messaging.

As a result, 1WorldSync, by Syndigo **strongly discourages** using non-printable characters, unless there are very good reasons to do so. That specifically applies to all of the "C1 Controls" codes:

- #x80 - #x9F (decimal: 128 - 159)

3.3.3. Further recommendations

There is another class of pseudo characters, the Combining Diacritical Marks, which may (and most probably will) cause trouble. Diacritical marks are detached ancillary glyphs which would normally be part of a composed letter, the dots of an umlaut for example.

Only in very particular situations, are such pseudo characters meant to follow another letter, which usually would not come with additional diacritical marks. For example, if you wanted an *M* with two dots above it, you could express it in UTF-8 as..

- #4D #CC #88

..where #4D stands for the M and the #CC #88 stands for the additional dots.

Unfortunately, this flexible approach chosen by the Unicode committee carried with it a new source of issues, namely the ambiguity to encode ordinary umlauts in more than one way, e.g.

#C3 #B6

which is the ordinary *ö*, contrary to the sequence

#6F #CC #88

which denotes an *o* with combined dots. Although the pool software is fine with synchronizing such combined characters via messaging, it is important to be aware that it may cause trouble when such characters are received by a retailer. Furthermore, the pool software will regard the ordinary *ö* and the combined *o* with umlaut dots as completely different characters.

1WorldSync, by Syndigo therefore discourages using combining diacritical marks, except in situations where no simpler alternative is available, e.g. niqqud, taškīl or similar diacritics.

4. Functional Connectivity

This chapter describes the functional connectivity with the DSE Data Pool. In this chapter you will find a list of the message types and their roles regarding retailer and supplier, respectively.

4.1. Message types and processes

4.1.1. Retailer view

A retailer who wishes to subscribe to item data must send a **CIS** or **RFCIN** to the DSE Data Pool. 1WorldSync, by Syndigo customers can also set up subscriptions (CIS and RFCIN) through the WebSubscription tool. The Subscription is forwarded to the Global Registry which in turn will forward it to any Source Data Pool with matching criteria. The results of a subscription will be transmitted via the predefined communication channel via AS2, HTTPS or sFTP. Please see chapter technical connectivity for details.)

4.1.2. Supplier view

The supplier transmits data to the DSE Data Pool via **CIN**. Upon receipt, the Data Pool performs validations (see chapter 9 for details). The DSE Data Pool automatically registers the new trade item data with the Global Registry by sending an **RCI**. The Global Registry confirms this message with a **CIRR** provided the GTIN is question is not yet registered. If the GTIN is already registered, the Global Registry responds with an **Exception**.

To make the data available to either selected retailers or a whole target market, the trade items need to be published. To do this the supplier sends a **CIP** to the DSE Data Pool.

4.2. Action code handling

Usually, a new item has the action code / document command header set to **ADD**. Any updates will come with **CORRECT** or **CHANGE_BY_REFRESH**.
In case an incoming CIN has the action **CORRECT** or **CHANGE_BY_REFRESH,** but the related items are not stored in DSE Data Pool, the item is considered new and the action code for the items will be stored as "**ADD**" in the DSE Data Pool data base.

If a recipient receives an already existing item with document command header **CORRECT** or **CHANGE_BY_REFRESH** for the first time, DSE Data Pool will deliver the appropriate CIN message with action code ADD to the recipient.

4.3. IsReload flag in CIN

The isReload (true/false) tag in the CIN message is used to send data to retailers as an initial load or new item add. Those terms are commonly used by US Retailers (Walmart, Kroger, etc.).

4.3.1. Supplier view

Initial load

An initial load means an item already exists in the retailer system, but it is the first time the supplier is sending the data through the data sync process. To send an item to the retailer using the CIN the supplier should either:

- send **CIN** ADD with isReload = true
- send **CIP** ADD
    - DSE Data Pool triggers a CIN ADD with isReload = true to the retailer

..or..

- send **CIN** ADD with isReload = false
- send **CIP** ADD with isReload = true
    - DSE Data Pool sends a CIN ADD with isReload = true to the retailer

New item add

A new item add is used for items that do not exist in the retailer's system. To send an item to the retailer using the CIN the supplier should:

- Send **CIN** ADD with isReload = false
- Send **CIP** ADD
    - DSE Data Pool sends CIN ADD with isReload = false to the retailer

Delete item
To delete an **item** a supplier has two options in GDSN:

- Discontinue Items
- Cancel Items

Discontinue Items
To express the date when an item is no longer to be manufactured the supplier must set two discontinue dates as follows:

- CIN/catalogueItemState class: discontinueDateTime (Messaging Process relevant)

AND

- CIN/tradeItemSynchronisationDates class discontinuedDateTime (Content Relevant)

Note: Make sure that both date entries have the same values!

Cancelling Items
An item must be cancelled if the appropriate physical product has never been delivered to the recipient, but master data did flow. In this scenario the supplier will just cancel the data by setting two cancel dates as follows:

- CIN/catalogueItemState class: cancelDateTime (Messaging Process Relevant)
  AND
- CIN/tradeItemSynchronisationDates class cancelledDateTime (Content Relevant)

Note: Make sure that both date entries have the same values!

4.3.2. Retailer view

The **Catalogue Item Notification (CIN)** message is used to send item data. The **documentStatusCode** and **isReload** flags tell you why the message was sent.

Scenario 1: New Item Data

- If a retailer receives a **CIN ADD** with **documentStatusCode = "ORIGINAL"** and **isReload = false**, the data is for a **new item** being added for the first time.

Scenario 2: Resent Item Data

- If a retailer receives a **CIN ADD** with **documentStatusCode = "COPY"** and **isReload = true**, the data has been sent again. This happens when the recipient has already received the item but has requested it again. This request could be triggered by the retailer (**RFCIN**) or by the supplier (**CIP with isReload extension**).

5. User Interfaces Publishing and Approval

5.1. Supplier User Interface - Publishing

Suppliers without any AS2 machine-to-machine connectivity to the DSE Data Pool can use the 1WorldSync, by Syndigo supplier UI called **Publishing**. We also support a Hybrid Configuration for M2M Suppliers to use Publishing in addition to benefit from the Validations in place, Publication Management, CIC Overview, and much more.

Usually small and medium enterprises make use of the Publishing to load and publish data by manual entry or via Excel upload. The Excel format has restrictions and specifications to be met to get the data accepted by the system. Also maintaining digital assets like images (e.g. jpg, png, etc.) and documents (pdf, mp4, etc.) can be done within Publishing. Publishing isn't part of M2M contracts; it must be ordered separately through our Sales team.

5.2. Recipient User Interface - Approval

Approval is a web application for recipients that allows to search and browse for synchronised item and price data. Approval also supports Excel and PDF download for further analysis and documentation purposes. Furthermore, Approval allows CIC auto-responding and community related extra checks beyond the GDSN basic validation rule set. This is mainly used in some specific industries and/or target markets (e.g. FMCG for Germany, Austria, etc.). As a summary the following features are supported:

- Search & Browse for items
- Download items in Excel, CSV or PDF format
- View item history / revisions and compare revisions
- Manage GDSN subscriptions to GLN, Target Market, GTIN, GPC or any combination
    - Request product data based on available subscriptions (RFCIN)
- CIC Auto responding
- Extra Validations

Approval isn't part of M2M contracts; it must be ordered separately through our Sales team.

Operating system	**No restrictions**
Broadband internet connection	At least 1 MBit DSL
Browser	Google Chrome (recommended) Mozilla Firefox Windows Internet Explorer 11
JavaScript enabled	**Required**
Accept cookies	**Required**
Accept CSS	**Required**
Accept popups	**Required**
Allow images	**Required**
Screen resolution	Min 1024*768

6. Communication – DSE Data Pool to Recipient

6.1. Messages

Recipients of a manufacturer's product data will receive it through GDSN **CIN** messages. If a product is no longer available, its publication is deleted, or a link correction is needed, a **CIHW** message will be sent and processed by the recipient's system.

1WorldSync GmbH, by Syndigo, offers an auto-validation and CIC-communication service through its recipient application called Approval. By default, this service exports only GDSN- or Target Market-valid data to the recipient's backend via sFTP, AS2, or Webservice. If the data contains errors, it will not be exported to the recipient. Instead, a CIC message with the errors (and any available warnings) will be sent back to the manufacturer's system.

Recipients are enabled to send in CIS and RFCIN messages via M2M.

7. Communication – Supplier to DSE Data Pool

7.1. Messages

7.1.1. Trading Partner Dependent Attributes (TPD)

Values for an attribute can vary depending on the relationship with the party receiving the data. The Trading Partner Neutral (TPN) and Trading Partner Dependent (TPD) status indicates this rule:

- **Trading Partner Neutral Attributes:**
  The condition **Trading Partner Neutral** is applied to any attribute whose value is independent of a buyer and seller relationship. An attribute, which has the condition Trading Partner Neutral, can have only one set of values.

- **Trading Partner Dependent Attributes:**
  The condition **Trading Partner Dependent** is applied to any attribute whose value is dependent on a buyer and seller relationship. An attribute, which has the condition Trading Partner Dependent, can have only one set of values per GLN of Party Receiving Data. These are attributes whose value is dependent on a specific point-to-point agreement between a buyer and a seller.

- **Trading Partner Neutral** and **Trading Partner Dependent Attributes:**
  An attribute that has the condition Trading Partner Neutral and Trading Partner Dependent, can have only one set of values for the Trading Partner Neutral value AND one set of values per GLN of Party Receiving Data (TPD).

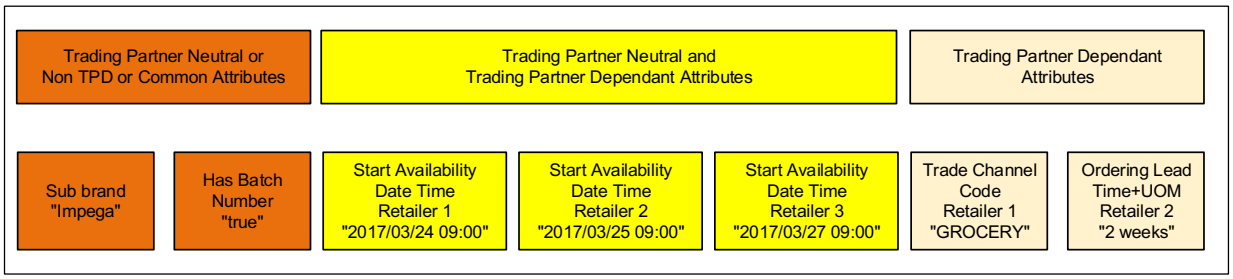


Figure 6: Example of TPD and Non TPD data

7.1.2. Implications for an Inbound CIN

As a supplier working with TPD, a Neutral CIN (valid for all recipients but the TPD recipients) must be sent and one separate CIN per TPD recipient containing the Partner Dependent values. A TPD CIN contains the following XML to activate the feature (placed according to the schema):

```
<partyInRole>
  <gln>$Recipient_GLN</gln>
  <partyRoleCode>PARTY_RECEIVING_PRIVATE_DATA</partyRoleCode>
</partyInRole>
```

For CINs with TPD values but no *partyInRole = Party Receiving Private Data & GLN* exist in the CIN, the TPD value will be processed like a neutral value and will potentially be sent to all recipients the data is published to.

The trade item status for the first CIN shall be “ADD”. Following CIN messages can be “ADD”, “CHANGE_BY_REFRESH” or “CORRECT”. If a new item is sent (Action Code: ADD) but fails, the Data Pool sends a gdsnException and the item won’t be stored. If a CIP for that item is sent afterwards, that one will fail as the item does not exist.

Important note: Once an item was declared trading partner dependant for a recipient it will remain like that. It is not possible to make an item back neutral for those retailers again.

7.1.3. Attribute Value Pair (AVP) Handling

AVP attributes are either specified as neutral or trading partner dependant (TPD). As there is no restriction regarding the usage of attributes in the DSE Data Pool, trading partners can agree upon proprietary AVPs to be exchanged bilaterally or with a dedicated number of recipients, without being officially supported by the DSE Data Pool. For a list official AVP please refer to the GDSN page for Fast Track attributes.

This has the following implications with regards to the AVP handling when updating existing items in the Data Pool.

Official AVPs supported in GDSN and/or specified by our communities

GDSN defined AVP (Fast Track Attributes) and AVP specified by the 1WorldSync, by Syndigo communities will be supported along with the defined TPD status.

- AVPs specified as **Non-TPD** will be delivered to all recipients that are supposed to receive the item. Any item updates with changes for those AVP values will automatically be transmitted to all recipients.
- AVPs specified as **TPD** will only be delivered to the explicitly dedicated recipients. Any item updates with changes for those AVP values will be updated for those TPD recipients only.

Non DSE Data Pool official / bilaterally used AVP

Any AVP unknown in the DSE Data Pool data model will always be treated as TPD. The same rule applies for the data delivery mechanism as for standard TPD attributes:

- AVP will be delivered to the appropriate TPD recipients only.
- Updates for existing Pub-Sub Matches will go to the dedicated TPD recipients as populated in the CIN message.
  If an update is meant to be transmitted to all recipients of an item individual CINs for each recipient must be created and sent to the Data Pool.

7.1.4. How DSE Data Pool Handles the “Last Change Date Time”

There was some confusion in the past regarding the Last Change Date Time handling in the DSE Data Pool. Below is a description how it works:

- A Supplier provides his “Last Change Date Time” in the incoming CIN
- DSE Data Pool stores that “Last Change Date Time” but it will not be used
- DSE Data Pool saves the date/time when the item was imported to the DSE Data Pool. This date/time value will be used in the “Last Change Date Time” attribute, when item is synced to the retailers

7.1.5. How DSE Data Pool Handles “Item Updates”

The DSE Data Pool uses a specific method to determine if an item update has **significant changes** before it is forwarded to a recipient. This prevents the system from sending pointless "updates" when nothing has changed in the item's content.

Here's how it works:

- **Checking for Changes:** The DSE Data Pool calculates a checksum (an md5 hash) of the new item's content. To do this, it first removes all line feeds and spaces.

- **Comparison:** The system then compares this new checksum with the checksum of the existing item.

- **No Change, No Forward:** If the checksums are the same, it means the content is identical. The update is not forwarded to the recipient.

This process ensures that changes like adding or removing a space or a line break do not trigger a new update. If you need to force an update, you must add or change **significant characters** in the item's content. This will create a new checksum, and the update will be forwarded.

7.2. Responses

The supplier can receive the following message types from the DSE Data Pool

- GS1 Response:
  - If the message is valid according to XML schema and the GDSN validation rule set
- GS1 Exception:
  - If the message violates XML schema or the GDSN validation rule set

Furthermore, the supplier might get feedback from the data recipient via the Catalogue Item Confirmation (CIC) message type with one of those statuses:

- RECEIVED
- SYNCHRONISED
- REVIEW
- REJECTED

In case of “REVIEW” the supplier should send an update to the synchronised item hierarchy based on the REVIEW’s content. In case of an item “REJECT” the recipient is not interested in further updates, so DSE Data Pool will skip any item updates for that recipient as the syncList entry for that item is set to REJECTED. Please note: CIC is optional in GDSN.

7.3. How to Reset Rejected GDSN Sync List Entries

In the Global Data Synchronization Network (GDSN), rejected items can be reset in a couple of ways to re-enter the data synchronization flow. The DSE Data Pool offers additional methods beyond the standard GDSN choreography.

1. Resetting with an RFCIN (Request for Catalogue Item Notification)

This is the standard way a **data recipient** can reset their sync list. The RFCIN message has an isReload flag that controls which items are requested again.

- **isReload = true**: This option requests only the items that are already in sync with the recipient. It **excludes** items that were previously rejected with a CIC-REJECT status. The rejected items remain untouched on the sync list.
- **isReload = false**: This option requests **all** items that match the criteria, including those that were previously rejected. When this is sent, the rejected items on the sync list are reset to an active, default status, allowing them to participate in the data synchronization again.

2. Resetting with a CIC (Catalogue Item Confirmation)

This method is **not supported** by the standard GDSN, but the DSE Data Pool allows a **data recipient** to use it. A recipient can send a new CIC message with an updated status (like RECEIVED, SYNCHRONISED, or REVIEW) to overwrite the REJECT status on the sync list. This action immediately reactivates the item for data synchronization.

3. Resetting with a CIP (Catalogue Item Publication)

This method is also a DSE Data Pool extension and allows the **data supplier** to reset the sync list. By including the isReload extension in a CIP message, the supplier can force a re-synchronization.

```
<extension>
        <isReloadExtension
                <isReload>true</isReload>
        </isReloadExtension>
</extension>
```

If a supplier sends a new CIP-ADD for an item that already exists for a specific recipient, it triggers a **"re-publish"** feature that forces the item to be synchronized again.

7.4. DSE Data Pool Response handling for basic GDSN use cases

Following table shows the DSE Data Pool response handling (GDSN-Response / GDSN-Exception)

#	Catalogue Item Publication (CIP) Handling		
	Use Case	**Description**	**DSE Data Pool reacts with…**
1	CIP “ADD” without item	Supplier sends CIP with action request ADD and the item which should be published isn´t in the Data Pool.	gS1Exception
2	CIP “ADD” with item	Supplier sends CIP with action request ADD and the item which should be published is in the Data Pool.	gS1Response
3	CIN – CIP “ADD” - CIS	CIS arrives on an already published item.	gS1Response (CIS)
4	CIN - CIS - CIP "ADD"	CIS arrives before item will be published.	gS1Response (CIS)
5	CIP “ADD” following CIP “ADD”	Supplier sends same CIP “ADD” twice. No impact, as DSE Data Pool ignores redundant publications	gS1Response (CIP)
6a	CIHW "PUBLICATION_WITHDRAWAL" without item	Supplier sends CIHW with hierarchyDeletionReasonCode PUBLICATION_WITHDRAWAL the item for which the publication should be deleted isn´t in the Data Pool.	gS1Exception
6b	CIP “DELETE” without item	Supplier sends CIP with action request DELETE and the item for which the publication should be deleted isn´t in the Data Pool.	gS1Exception
7a	CIHW "PUBLICATION_WITHDRAWAL" with item, CIP „ADD“ is missing	Supplier sends CIHW with hierarchyDeletionReasonCode PUBLICATION_WITHDRAWAL but never sent a sufficient CIP with action request ADD.	gS1Exception
7b	CIP "DELETE" with item, CIP „ADD“ is missing	Supplier sends CIP with action request DELETE but never sent a sufficient CIP with action request ADD.	gS1Exception
8a	CIHW "PUBLICATION_WITHDRAWAL" with item, having valid CIP "ADD" stored in the DSE Data Pool	Supplier sends CIHW with hierarchyDeletionReasonCode PUBLICATION_WITHDRAWAL. Before DS sent a valid CIP with action request ADD.	gS1Response
8b	CIP "DELETE" with item, having valid CIP "ADD" stored in the DSE Data Pool	Supplier sends CIP with action request DELETE. Before DS sent a sufficient CIP with action request ADD.	gS1Response

9	CIP "ADD" to GLN with 1WS extension for “isReload-Functionality”, "isReload = true"	Supplier sends CIP with action request ADD and isReload flag = true.	gS1Response (isReload flag will set to “true” in the first outgoing CIN to the recipient.)
10	CIP "ADD" to GLN with 1WS extension for “isReload-Functionality”, “isReload = false"	Supplier sends CIP with action request ADD and isReload flag = false.	gS1Response (isReload is “false” per default)
#	**Catalogue Item Notification (CIN) Handling**		
	Use Case	**Description**	**DSE Data Pool reacts with…**
1	CIN “ADD” and CIN “ADD”	Supplier sends CIN with action request ADD followed by the same item with same action request ADD.	gS1Response
2a	CIN “CHANGE_BY_REFRESH” or “CORRECT” to change hierarchy having send CIHW "LINK_CORRECTION" before	Supplier sends update to an item hierarchy after having put the status “ON_HOLD” by sending a CIHW "LINK_CORRECTION" in advance.	gS1Response
2b	CIN “CHANGE_BY_REFRESH” or “CORRECT” to change hierarchy without having send a CIHW "LINK_CORRECTION" before	Supplier sends update to an item hierarchy without having put the status “ON_HOLD” by sending a CIHW "LINK_CORRECTION" in advance. This is not allowed since BMS 3.1 released in May 2016.	gS1Exception
#	**Catalogue Item Subscription (CIS) Handling**		
	Use Case	**Description**	**DSE Data Pool reacts with…**
1	CIS “DELETE” on non-existing CIS	Recipient sends CIS with action request DELETE on non-existing CIS.	gS1Exception
2	CIS “ADD” and CIS “ADD”	Recipient sends same CIS with action request ADD twice.	gS1Response (no impact)
3	CIS “DELETE” and CIS “DELETE”	Recipient sends same CIS with action request DELETE twice.	gS1Exception
#	**Catalogue Item Confirmation (CIC) Handling**		
	Use Case	**Description**	**DSE Data Pool reacts with…**
1	CIC with one of the following statuses without item in Data Pool: “RECEIVED” “SYNCHRONISED” “REVIEW” “REJECTED”	Recipient sends CIC with one of the four statuses and the item which was tagged with that special status isn´t in the Data Pool.	gS1Exception
2	CIC with one of the following statuses with item in Data Pool: “RECEIVED” “SYNCHRONISED” “REVIEW” “REJECTED”	Recipient sends CIC with one of the four statuses and the item which was tagged with that special status is in the Data Pool.	gS1Response
3	CIC ”REJECTED” followed by CIC “RECEIVED” (item in Data Pool)	Recipient sends CIC with status “RECEIVED” after CIC with status "REJECTED" for an item which is in the Data Pool.	gS1Response
4	CIC “RECEIVED” followed by CIC “RECEIVED” (item in Data Pool)	Recipient sends CIC with status “RECEIVED” after CIC with status “RECEIVED” for an item which is in the Data Pool.	gS1Response

8. Item Hierarchies

When sending hierarchies to the pool, it is important to note that they must be complete. It is possible for suppliers to transmit individual hierarchy levels, but they must be complete and every level that is higher than a base unit must contain the child link information. DSE Data Pool only sends out complete hierarchies to the recipient.

8.1. Item Hierarchy Basic Rules

Each level of the product packaging hierarchy requires its own unique GTIN (in conjunction with the Information Provider GLN and the target market country code). For example, a consumer unit packaged in an inner pack, loaded in a case, and shipped on a pallet would need four GTINs:

- One GTIN representing the base consumer unit
- One GTIN representing the inner pack
- One GTIN representing the case
- One GTIN representing the pallet

About item hierarchies
You should not publish any items in a hierarchy until the hierarchy is complete. Please be aware that the process to modify an already synced hierarchy is complex. Any hierarchy related mistakes should be avoided before publishing and synchronising to the retailer. Otherwise, the CIHW (catalogue item hierarchy withdrawal) process has to be executed to revoke the publication and update the hierarchy.

To build a hierarchy, you must start at the lowest level — items must be linked in the order of lowest to highest. For example, let's say you have 3 items:

- **Pallet** item, which contains 3 Case items: the Retailer orders by the pallet
- **Case** item, which contains 12 base units (Cans); the Retailer sells by the case
- **Can** item (base unit); the Retailer also sells by the can

In this case, you would first add the CAN item to the Catalogue.

Next, you would add the Case item, and
- For the tradeItemIdentificationOfNextLowerLevelTradeItem field, you would enter the GTIN of the CAN.
- For the quantityOfChildren, you would enter 12, because there are 12 cans per case.

Finally, you would add the Pallet item, and
- For the tradeItemIdentificationOfNextLowerLevelTradeItem, you would enter the GTIN of the Case.
- For the quantityOfChildren field, you would enter 3, because there are 3 cases per pallet.

The previous example applies to item loading via the web or any other machine-to-machine format you may be using. This order is important because, to send a case item and a link to its lower-level item, the lower-level must first exist as an item.

Rules

The following rules apply when creating a hierarchy.

- All items in a hierarchy MUST have the same GLN of Information Provider and Target Market Country Code.
- To publish the hierarchy, the hierarchy must contain at least one orderable unit AND one invoice unit.
- For a BASE_UNIT_OR_EACH item, there can be no lower level / child item.

How to Modify Item Hierarchies

DSE Data Pool supports changes to item hierarchies, including swapping GTINs. If you need to modify key attributes like **tradeItemUnitDescriptor**, **isTradeItemABaseUnit**, or **isTradeItemAnOrderableUnit**, you can choose one of two methods.

1. Unpublish and Republish

This is the most straightforward method:

- First, revoke the publication of the hierarchy from all retailers.
- Next, make your changes to the hierarchy and send in the new CIN
- Finally, republish the corrected hierarchy with a CIP ADD

2. Use a CIHW Link Correction Message

Introduced in the Major Release 3.1 in May 2016, the **Catalogue Item Hierarchy Withdrawal (CIHW)** message allows for a more controlled hierarchy modification. This is the recommended approach for editing hierarchy configurations.

- Send a CIHW message with hierarchyDeletionReasonCode set to **HIERARCHY_LINK_CORRECTION**. This puts the hierarchy's publication state on **"ON_HOLD"** in the DSE Data Pool. This message is also sent to any affected recipients, instructing them to delete the current hierarchy in preparation for the new one.
    - It is not guaranteed that a recipient implemented CIHW in their systems
- Once the publication is on hold, you can fix the hierarchy.
    - Keep in mind that a hierarchy on hold cannot be published to any new recipients.
- After making your changes, resend the corrected hierarchy via a **CIN-ADD** message. This will automatically change the publication status back to **active** and continue the synchronization process. No CIP ADD message is needed.

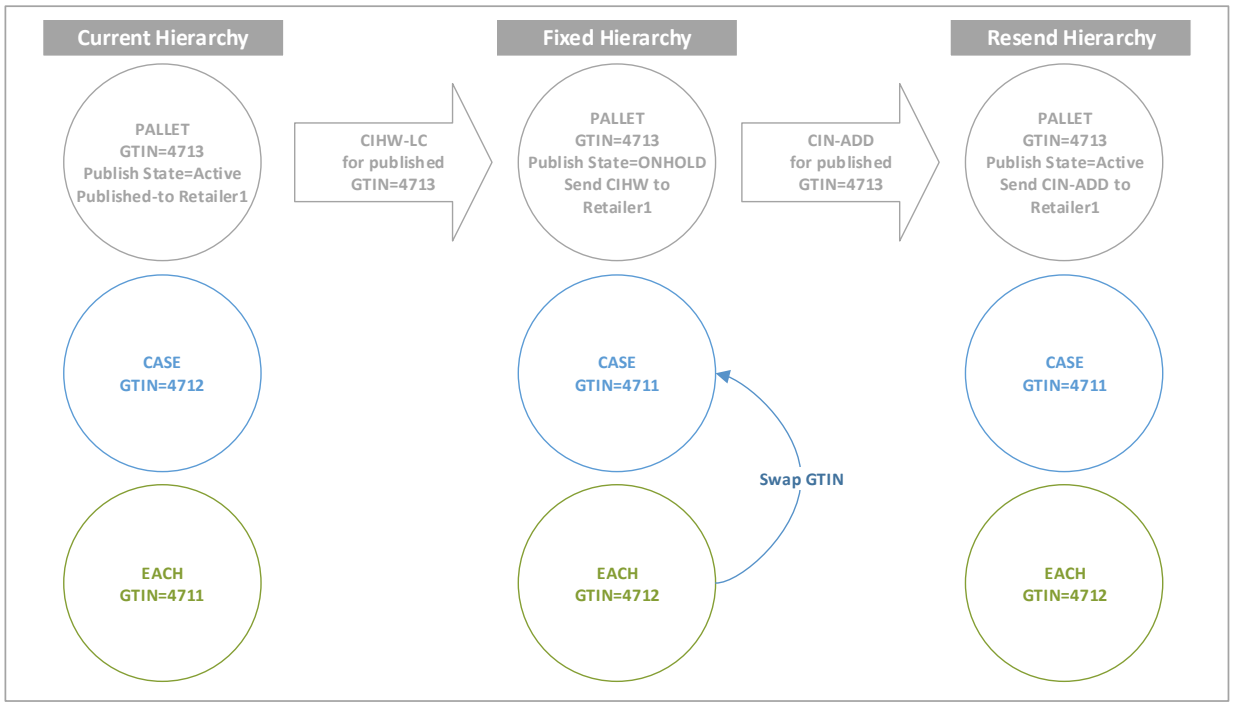


Figure 8: Hierarchy Link Correction process via CIHW (Basic Workflow)

8.2. Nested

The term nested hierarchy is used for item data that is sent with the information contained in a hierarchy. Illustrated with example below (not XML well-formed):

```
<eanucc:transaction>
[...]
  <gdsn:catalogueItemNotification>
    <catalogueItem>
      <tradeItemUnitDescriptor>CASE</tradeItemUnitDescriptor>
      [...]
      <catalogueItemChildItemLink>
         <catalogueItem>
           <tradeItemUnitDescriptor>BASE_UNIT_OR_EACH</tradeItemUnitDescriptor>
           [...]
           <catalogueItemChildItemLink>
         </catalogueItem>
       </catalogueItemChildItemLink>
      </catalogueItem>
    </catalogueItemChildItemLink>
  </gdsn:catalogueItemNotification>
</eanucc:transaction>
```

Figure 9: XML example for nested message

8.3. Unnested

The term unnested hierarchy is used when users send GDSN CIN Messages in which the items are not nested in a hierarchy structure. In this case the system internally links these items to the corresponding structure. Illustrated with example below (not XML well-formed):

```
<eanucc:transaction>
[...]
  <gdsn:catalogueItemNotification>
    <catalogueItem>
    <tradeItemUnitDescriptor>CASE</tradeItemUnitDescriptor>
    [...]
    </catalogueItem>
  </gdsn:catalogueItemNotification>
  <gdsn:catalogueItemNotification>
    <catalogueItem>
    <tradeItemUnitDescriptor>BASE_UNIT_OR_EACH</tradeItemUnitDescriptor>
    [...]
    </catalogueItem>
  </gdsn:catalogueItemNotification>
</eanucc:transaction>
```

Figure 10: XML example for unnested message

Transmission of unnested hierarchies:

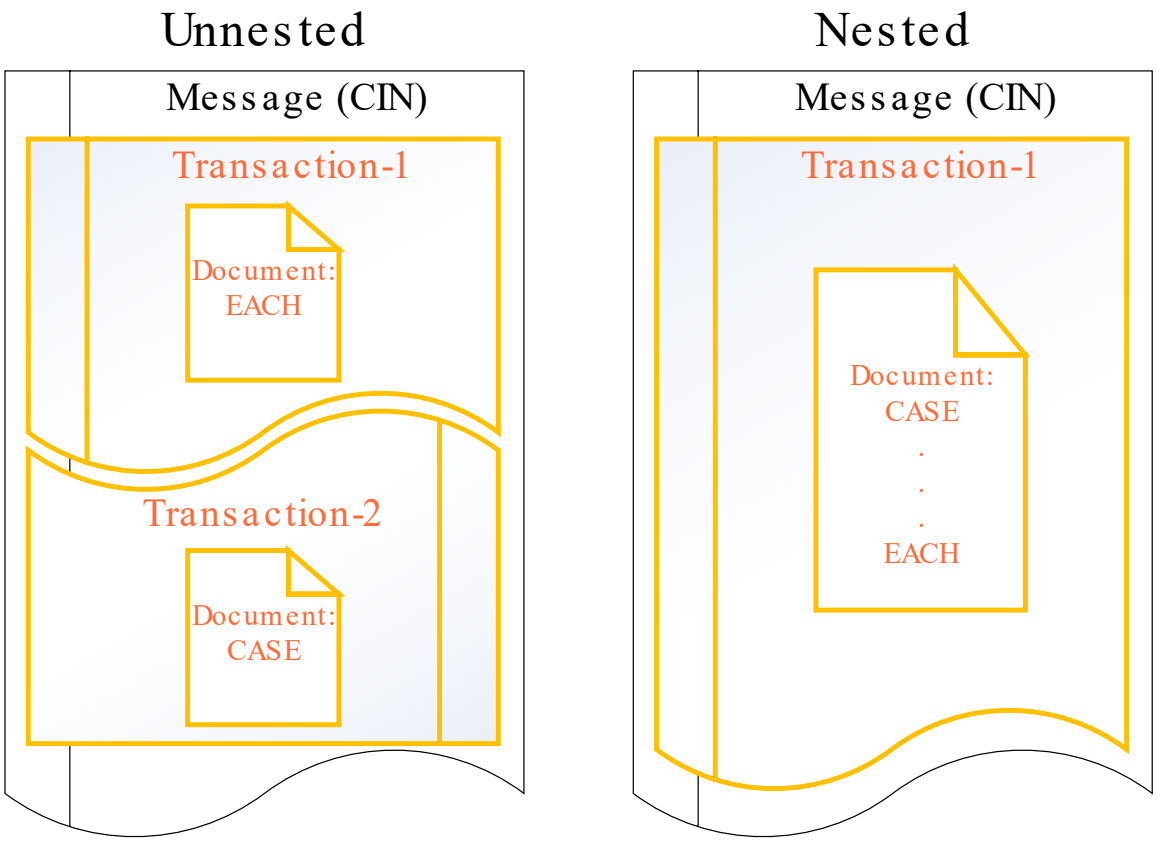


Figure 11: Illustration of un-nested hierarchies vs. nested hierarchies

Hierarchies can be transmitted in different messages. Please note that it is **mandatory** to transmit the message containing the base item **first**, followed by the e.g. a case which must contain the link to the base in question. **Transmitting the message with the case first will result in an error**.

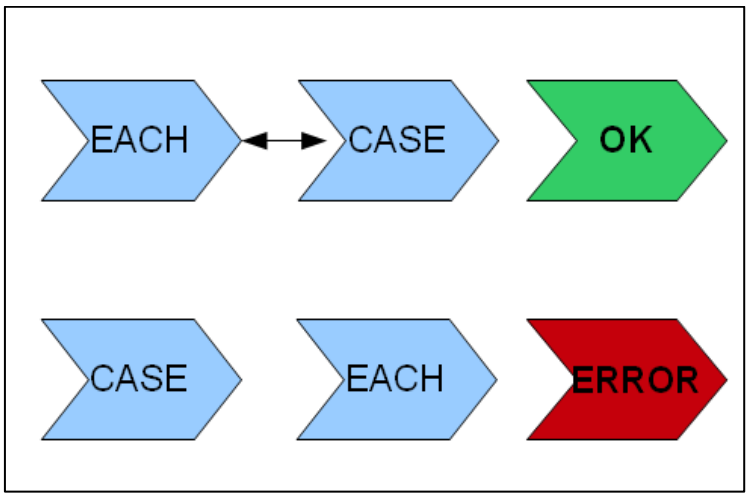


Figure 12: Transmission of hierarchies in different messages (for ADD)

9. Validations

To ensure high data quality DSE Data Pool performs two different kinds of validation – Schema Validations and Content Validations. It is possible that two validations may check the same content.

Note: For users of the Publishing UI both types of content and schema validations are performed directly in the software.

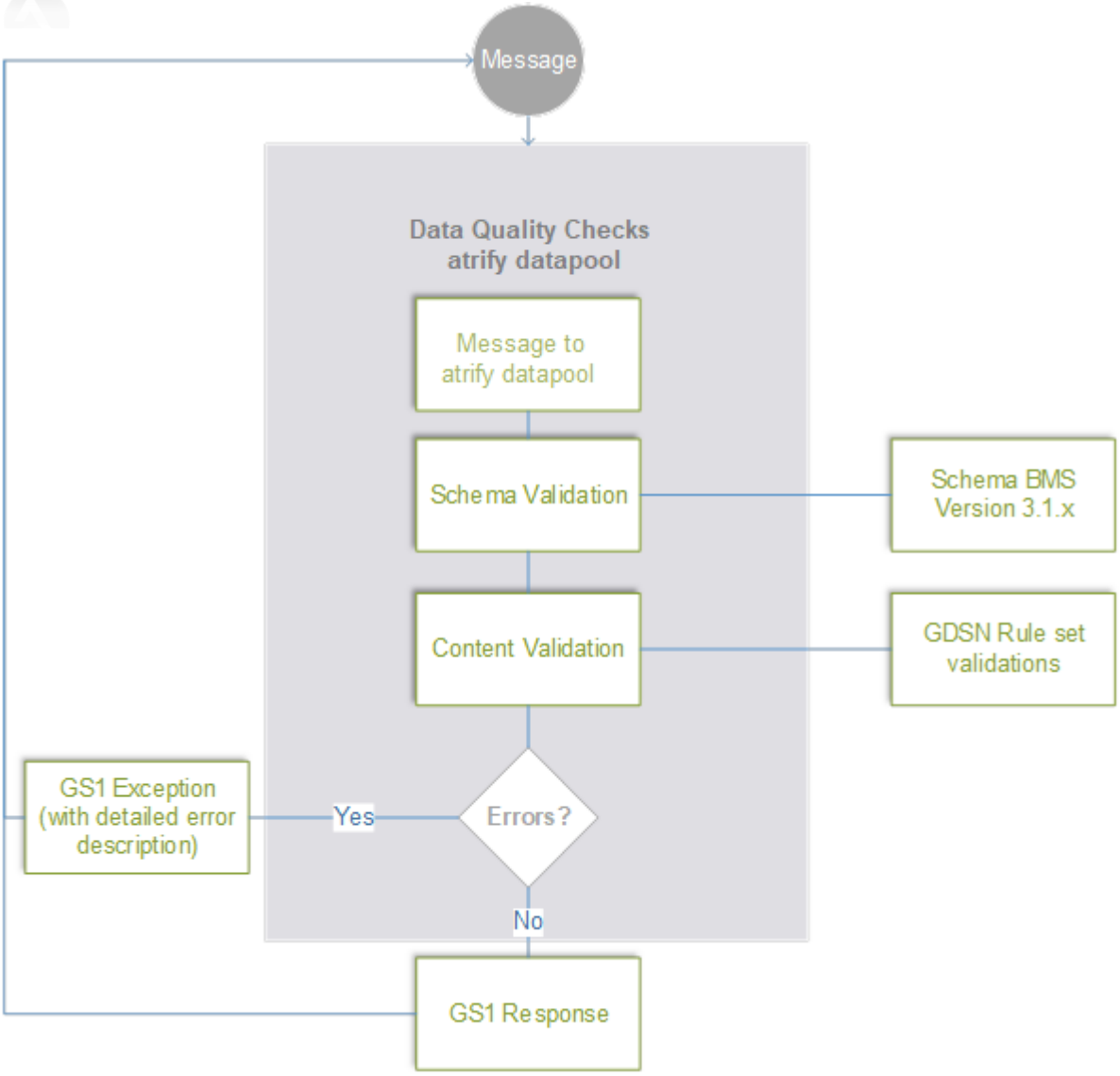


Figure 13: To ensure data quality: validation process

9.1. Schema Validations for Incoming Data

When a supplier sends data, it first goes through a **Schema Validation** check. This process verifies that the incoming data complies with the current GDSN schema.

If any XML schema errors are found, the system immediately rejects the message. An exception message is then sent to the customer, and no further processing is performed.

If the message is valid, the system proceeds to the next step: **Content Validations**.

Examples:

Incorrect:

- <isTradeItemABaseUnit>yes</isTradeItemABaseUnit>
- <isTradeItemAConsumerUnit>no</isTradeItemAConsumerUnit>
- <isTradeItemADespatchUnit>1</isTradeItemADespatchUnit>
- <isTradeItemAVariableUnit>0</isTradeItemAVariableUnit>

Correct:

- <isTradeItemABaseUnit>false</isTradeItemABaseUnit>
- <isTradeItemAConsumerUnit>false</isTradeItemAConsumerUnit>
- <isTradeItemADespatchUnit>true</isTradeItemADespatchUnit>
- <isTradeItemAVariableUnit>false</isTradeItemAVariableUnit>

9.2. Content Validations

After the initial schema check, the system performs a **Content Validation** to ensure the data adheres to GDSN rules. This process verifies:

- **Primary keys** are correct.
- **Dependencies** between data elements are valid.
- The **format** of specific entries meets all requirements.

If any content errors are found, the system rejects the message and sends an exception message to the customer with a detailed error description.

The following table lists some examples of the content related validations:

Text of rule	Related attribute(s)	Note
If tradeItemUnitDescriptor is equal to 'BASE_UNIT_OR_EACH' then ChildTradeItem/gtin must be empty.	Trade Item Unit Descriptor Child Trade Item – Trade Item Identification: GTIN	
If gross weight is not empty and net weight is not empty, then gross weight must be greater than or equal to net weight.	Net Weight Gross Weight Gross Weight UMO	
The effective date time must not be empty.	Effective Date	
A value for Classification Category Code was given, but the indication is missing.	If AdditionalClassificationCategoryCode Then -> EANUCC ClassificationAttributeTypeCode AND -> EANUCC ClassificationAttributeValueCode (Core Item)	
The value “x” in attribute “y” is outside of the permissible range (1 - 999) or the number of digits after the decimal point is incorrect.	allowed range 1 - 999 for attributes: QuantityOfInnerPack CouponFamilyCode quantityOfNextLevelTradeItemWithinInnerPack PegHoleNumber allowed range: 1 - 999	
The value “x” in attribute “y” is already being used as primary key value for another product.		DuplicatePrimaryKey

Table 7: Examples for content validations

The full list of all GDSN validations can be found here:

- https://www.gs1.org/standards/gdsn
  - Refer to the “current” or “future” version to get to the **validation rules** document

All suppliers sending CIN messages to the DSE Data Pool must respect GDSN rules.

10. Price Synchronisation

This section provides some background to the GDSN **Price** and **Price Relationship** synchronization.

10.1. GDSN Background

The Price Synchronisation message set includes the following messages:

- Price Synchronisation Document (PSD)
- Price Synchronisation Confirmation (PSC)
- GDSN Response Messages
    - GS1 Response (positive use case)
    - GS1 Exception (negative use case)

The price message is made up of a header segment and up to four distinct segments (relationship, condition, item depiction, price type) with specific purposes. Each segment has an action code and segment ID to ensure referential integrity. A single price message can be used for many different purposes including the following:

- Establishing a Trading Partner Relationship
- Communicating elements of prices that are included on an invoice in an effort to equal the actual payment and the expected payment

If a change is required for an attribute, all mandatory and any desired optional attributes originally included in that segment must be included in the message. A segment is modified by a full refresh.

The **Price Synchronisation Document (PSD)** message is a complex message that carries the price information in multiple segments to address the needs of a business relationship. The table below provides a conceptual layout of the message and the supported segment types.

Segment	Description
Price Synchronisation Header Segment	• Identifies both Information Provider & Party Receiving Private Data • Contains a Price Document ID and references a Relationship ID • Mandatory, header travels with each Price Document
Relationship Segment	• Establishes Price Sync Relationship parameters (similar to TPD) • Contains a Relationship ID and an Action Code • Qualifies the Business Location of Party Receiving Private Data
Condition Segment	• Used to sync Summary Conditions and conditions that are not item specific • *(out of scope, not used in GS1 Australia)*
Item Depiction Qualifier	• Header for the Price Type Segment • Used to qualify the Trade Item • Multiple Item Depiction Qualifiers are allowed per document
Price Type Segment	• Used to associate price components with the Trade Item • Contains a Price Type ID and an Action Code • At least one Price Type is required per Trade Item depicted • May contain a Bracket Qualifier subclass • Multiple Price Types are allowed per Trade Item

A segment Action Code must be present for each segment. The supported Action Codes are:

Action Code	Description
ADD	to add a new segment or a new item price type record within an existing Item Depiction segment
CHANGE_BY_REFRESH	to change the values for selected mandatory and all optional attributes
CORRECT	may only be used to change the value of some mandatory key attributes or an attribute where the change results in a material financial impact. The other mandatory attributes that need to be revised require a “DELETE” followed by a new “ADD”
DELETE	to remove an existing segment or record within a segment
NO_ACTION	to indicate that a previously existing segment or record is being sent, but none of the values have changed **NOTE**: The GS1 Australia community currently does not make use of action code “NO_ACTION”.

The **Price Synchronisation Confirmation** message is used to indicate the acceptance or rejection status for each segment. The underlying requirement is that a confirmation status needs to be provided by the data recipient for each segment. A “No Response” is considered a negative status or non-acceptance, in all cases except when adding a relationship segment. The confirmation message refers to the Price Synchronisation Document and the segment when providing a confirmation status.

The Price Synchronisation Document can be packaged in a single GDSN message either as 'multiple documents in a single transaction' or 'multiple transactions with each containing a single document' or single transaction containing a single document'. The rule requiring that the SDP provide a sequential identifier (Price Synchronisation Document Identification) for each PSD will be enforced irrespective of how the document is packaged in a transaction inside a GDSN message.

The transaction as identified in the GDSN message will dictate the following rules around processing of the message, as has been GDSN practice:

- if a single Price Synchronisation Document fails during processing, all Price Synchronisation Documents in that transaction will fail;
- a transaction will be processed successfully only when all contained Price Synchronisation Documents have been processed successfully.

The GDSN use cases itself are specified in the “Business Message Standard (BMS) – Price Synchronisation” document and are listed here in summary.

UC-1 Add Trading Relationship – SDP creates a relationship by sending a Price Synchronisation message with a document command of “ADD” with a relationship segment action code of “ADD” to the RDP.

UC-2 Update Trading Relationship – SDP updates the relationship by sending a Price Synchronisation message with a document command of “CHANGE_BY_REFRESH” with a relationship segment action

code of “CHANGE_BY_REFRESH” (for a modification) or “CORRECT” (for a correction) to the RDP.

UC-3 Cancel Trading Relationship – SDP terminates the relationship by sending a price synchronisation message with a document command of “CHANGE_BY_REFRESH” with a relationship segment action code of “DELETE” to the RDP.

UC-4 Discontinue Trading Relationship – SDP terminates the relationship by sending a price synchronisation message with a document command of “CHANGE_BY_REFRESH” with a relationship segment action code of “CHANGE_BY_REFRESH” and an appropriate relationship effective end date to the RDP.

UC-9 Add Item Price Type – SDP creates a price synchronisation message with a document command of “CHANGE_BY_REFRESH” (if the trading relationship has already been established) and the price type segments with a segment action code of “ADD” to the RDP and updates the price synchronisation list.

UC-10 Modify Item Price Type – SDP creates a price synchronisation message with a document command of “CHANGE_BY_REFRESH” and the price type segments with a segment action code of “CHANGE_BY_REFRESH” (for a modification) or “CORRECT” (for a correction) to the RDP and updates the price synchronisation list.

UC-11 Withdraw Item Price Type – SDP creates a price synchronisation message with a document command of “CHANGE_BY_REFRESH” and the price type segments with a segment action code of “DELETE” and updates the price synchronisation list.

UC-12 Discontinue Item Price Type – SDP creates a price synchronisation message with a document command of “CHANGE_BY_REFRESH” and the price type segments with a segment action code of “CHANGE_BY_REFRESH” and a populated price type effective end date to the RDP and updates the price synchronisation list.

Actor	Event	Action	Comment
Data Source	ADD a relationship segment	PSD ADD with relationship segment and Action Code ADD is synchronised (sent to RDP).	
Data Source	ADD an item depiction segment (contains at least one item price type segment)	PSD CHANGE_BY_REFRESH with item depiction segment and the associated item price type segment with Action Code ADD is synchronised.	
Data Source	ADD a relationship segment and one or more item depiction segments	PSD ADD, with all segments and associated Action Codes ADD is synchronised.	
Data Source	Update a relationship segment with action CHANGE_BY_REFRESH	PSD CHANGE_BY_REFRESH with relationship segment and Action Code CHANGE_BY_REFRESH is synchronised.	Positive confirmation status on the segment is required except when the previous action was ADD.
Data Source	Update an item depiction segment and/or item price type segment with action CHANGE_BY_REFRESH	PSD CHANGE_BY_REFRESH with item depiction and the associated item price type segment and Action Code CHANGE_BY_REFRESH is synchronised.	The relationship and item price type segment must have a positive confirmation status. The item depiction itself does not have an associated Action Code or a sync list.
Data Source	Update any combination of relationship and item depiction segments with individual actions CHANGE_BY_REFRESH	PSD CHANGE_BY_REFRESH with the segments and Action Code CHANGE_BY_REFRESH is synchronised.	The relationship and each of the segments must have a positive confirmation status.
Data Source	Correct a relationship segment with action CORRECT	PSD CHANGE_BY_REFRESH with the relationship segment and Action Code CORRECT is synchronised.	The relationship segment must have a positive confirmation status except when the previous action was ADD.
Data Source	Correct an item price type segment with action CORRECT	PSD CHANGE_BY_REFRESH with item depiction and the associated item price type segment and Action Code CORRECT is synchronised.	The relationship and item price type segment must have a positive confirmation status.
Data Source	Correct any combination of relationship and item depiction segments with individual actions CORRECT	PSD CHANGE_BY_REFRESH with the segment and Action Code CORRECT is synchronised.	The segments must each have a positive confirmation status.
Data Source	Delete a relationship segment with action DELETE	PSD CHANGE_BY_REFRESH with the relationship segment and Action Code DELETE is synchronised.	The relationship must not have any existing segments associated that have not been deleted.

Data Source	Delete an item depiction segment and an item price type segment with action DELETE	PSD CHANGE_BY_REFRESH with item depiction and the associated item price type segment and Action Code DELETE is synchronised.	The relationship must have a positive confirmation status, and the dependent segments must all be deleted.
Data Source	Delete a combination of relationship, item depiction and item price type segments with individual action DELETE	PSD CHANGE_BY_REFRESH with the relationship, item depiction and item price type segment with individual Action Code DELETE is synchronised.	Individual restrictions will apply as specified for each of the segments.
Data Source	A group of segments with distinct Action Codes is provided	The corresponding PSD CHANGE_BY_REFRESH with all processed segments and their Action Codes will be synchronised.	Individual restrictions will apply as specified for each of the segments.
Data Recipient	A positive confirmation message is received for a segment	Any pending updates for this segment as well as any depending segments will be synchronised as a PSD CHANGE_BY_REFRESH.	Individual restrictions will apply as specified for each of the segments.

Table lists the events triggering the Price messaging use cases.

10.2. Processing PSD Messages

The DSE Data Pool supports two modes of operation for processing incoming PSD messages (similar to CIN processing)

- “pass-through” mode for data sent from other Data Pools
- “local” mode for data sent from suppliers for which this DSE Data Pool instance acts as Home Data Pool

10.2.1. Processing PSD Messages in Common

DSE Data Pool processes an incoming PSD message as follows:

- All messages received from a Data Source are processed in the order they were received.
- An inbound PSD is validated against the schema and associated code lists.
- A PSD with no segments or invalid segments will be rejected.
- The system validates that the PSD is associated with a Document Command Header type of either “ADD” or “CHANGE_BY_REFRESH”. No other commands (“CORRECT”, “DELETE”) are supported for this message and will cause the transaction to be rejected.
- The Content Owner at each of the segment level should be consistent with the Information Provider defined for the Relationship.
- The PSD message must always contain the Header Segment to identify a relationship between the source and the recipient.
- The Price Synchronisation Document ID is mandatory and must be unique and sequentially incremented within a particular Price Relationship. The SDP maintains for each Data Source and Data Recipient relationship a sequence for the Price Synchronisation Document ID. The messages from the data source will not be subjected to this same validation and will be allowed to use their own specific scheme for the ID. The outbound message will contain an updated ID that reflects the sequential ID rule.
- In the absence of any reference to an item in the segments, the SDP creates the synchronisation list entry and sends the information to the Data Recipient or RDP.
- If a segment is synchronised with a positive status, an update to the segment will cause the sync list status to be reset to a negative value of “No Response” pending the receipt of a positive status from the recipient.
- The DSE Data Pool will reject the failing transactions and continue processing only the successful transaction.
- A GS1 Response will be generated for each PSD processed, indicating the success or failure appropriately.

10.2.2. Special Requirements for Processing Price Type Segments

The Item Price Type segment is used to synchronise Price Types for the item/s depicted in the Item Depiction segment. Data Recipients cannot accept or reject individual Brackets Qualifiers. If the requirement is to discontinue a Price Type, the End Effective Date must be populated or updated. If the action code is “DELETE” there should be no dependent Price Types, and the price should not yet be in effect.

- The Price Type segment is mandatory and repeatable within each Item Depiction Qualifier.
- If the Item Depiction segment is available, the SDP checks against the item synchronisation list that the confirmation status is not “REJECTED”. If the item synchronisation is rejected, price synchronisation segment is also rejected for the item. The system shall monitor the item sync list every time a price is synchronised for the item to insure that the item has not been rejected.
- A Price Type can be synchronised only if:
    - The segment itself has a positive status if previously synchronised;
    - The Relationship has a non-REJECT Status
    - The associated Item Depiction segment has a non-REJECT status (that is none of the Price Types associated with the Item Depiction segment has a REJECT status);
    - The Target Price Type if it exists has a positive status;
- Multiple Price Types may exist simultaneously for a Catalogue Item and each Price Type will have it’s own confirmation status.
- The Bracket Qualifier group of attributes is not a segment and hence does not have an associated confirmation status. It is repeatable within each price type segment. A bracket can only exist once in the Relationship; however, this will not be checked for uniqueness by the DSE Data Pool.

10.2.3. Special Requirements for Processing Relationship Segments

- IMPORTANT: Price Relationship segments are synchronised independently of items. There is no dependency on a subscription.
- If the Document Header Command is “ADD”, this is the first message for a Relationship and hence the Price Synchronisation Document ID assigned by the SDP must = “1”.
- If the Document Header Command is “ADD”, the PSD must include a relationship segment at the minimum.
- An Action Code of “DELETE” on a Relationship is only allowed when the Effective Start Date is in the future, will trigger the SDP to delete the relationship. This will require that all associated segments be deleted prior to processing the Relationship segment delete.
- The Relationship Identification is mandatory, and must be unique within the data source, and must equal the Relationship Identification in the header. The Data Source cannot create two Relationships with the same ID.
- The “No Response” status for the sync list is considered to be a negative status along with the “REJECTED” status and will cause future synchronisation to stop. The only defined exception to this rule is when synchronising an update on a relationship segment following a “No Response” to a Relationship segment with the Action Code of “ADD”. The definition for a positive status on the confirmation of a Relationship segment, when the action was “ADD” includes the status of “No Response”. The synchronisation of other segments associated with a segment of an Action Code of “ADD” and a status of “No Response” will be stopped.

- If the PSD contains at least a Relationship segment with an Action Code of “ADD”, there are no dependency checks executed across the segments. The sync list for each of the segments will not be checked for a positive status in this case.
- If the PSD contains different segment types and the Relationship segment Action Code does NOT equal “ADD”, a processing must follow the sequence below starting at the top of the list, and following the order of the next entry in the list:
    - Relationship Segment
    - Dependent Price Type Segments
    - Segment Depends on Price Type Segments
- The validation will confirm a positive sync list status and verify the sync list of any dependency between segments.
- If ending a Relationship segment, all Price Type segments for the relationship segment must be deleted/end dated before a delete/end date can be sent for the Relationship segment.

10.3. Processing PSC Messages

The Price Synchronisation Confirmation PSC message is used to communicate the status at the recipient end to the source of the price information one segment at a time. Unlike item confirmation (via CIC), price confirmation is mandatory in GDSN, i.e. a supplier cannot update a price or relationship unless it has been responded by the recipient via PSC. In this context “No Response” is effectively a negative confirmation and stops the synchronisation process.

The set of synchronisation confirmation status codes is defined in the XML schema and is the same as used for CIC:

Confirmation Status Codes	Description
RECEIVED	Data has been received by the Recipient, but no business decision has been made on the data.
REVIEW	A request to the Data Source to “review” their data because the Data Recipient has received discrepant data which they cannot synchronise.
SYNCHRONISED	Data is integrated and in sync. Usually it implies that the data has been implemented into the Data Recipient’s back-end system.
REJECTED	The Recipient requests that no further updates are desired. Data will no longer be synchronised or updates will no longer be provided.

DSE Data Pool is processing an incoming PSC as follows:

- All messages received from a Data Recipient will be processed in the order they were received.
- An inbound PSC will be validated against the schema and associated code lists.
- The system will validate that the PSC is associated with a Document Command Header type of “ADD”. No other commands (“CHANGE_BY_REFRESH”, “CORRECT”, “DELETE”) are supported for this message and will cause the transaction to be rejected.
- A PSC message must refer to a segment that was received for the Data Recipient. Else the message will be rejected.

- The Content Owner at the transaction and command level should be the data recipient, however the content owner at each of the segment level should be consistent with the data source (information provider) defined for the relationship.
- The DSE Data Pool will reject the failing transactions and continue processing only the successful transaction.
- A GDSN response will be generated for each PSC processed, indicating the success or failure appropriately.
- A Data Recipient can send multiple confirmations for a single price message or message segment.

10.4. Price Validations

All inbound messages (PSD and PSC) are validated by the DSE Data Pool. For external Trading Partners from other Data Pools (pass-through) XML schema validation is performed only.

10.4.2. Basic Validation

Basic validation is already an integral part of the existing DSE Data Pool, and includes the following checks:

- XML schema validation
- Valid use of code list attributes
- GTIN/GLN check digit validation
- Document type consistency (cannot mix document types in a single file)
- BMS version number consistency

10.4.3. GDSN Rules Validation

Validating the GDSN rules (as specified in “BMS Validation Rules for Global Data Synchronisation Network” document) includes:

- Business validations on the relevant attributes as indicated for each segment.
- Validate the changes to the segment agree with the Action Code specified.

For more details on GDSN price rules check documents in the following link:

- https://www.gs1.org/standards/gdsn
    - Refer to the “current” or “future” version to get to the validation rules document

Note: In the pass-through mode GDSN validation rules are not performed by the DSE Data Pool as this is the Source Data Pools responsibility to send valid GDSN data only.

10.5. PSD Message Structure

The PSD message is no different to other GDSN messages (e.g. CIN) in its internal structure (see XML Schema for details):

Header

Message

+-- Transaction [1..*]

+-- Command [1..*]

+-- DocumentCommand

+-- DocumentCommandHeader

+-- DocumentCommandOperand

+-- PriceSynchronisationDocument

Multiple transactions per message are allowed and governed by the following rules:

- For incoming messages, each relation and price segment is processed in the order they appear in the message.
- For synchronizing with the Retailers, one transaction is created for each change of Item Depiction + Recipient + Relationship combination.
- All prices having the same combination of Item Depiction + Recipient + Relationship combination will be in the same transaction.

10.6. Price Duplication

10.6.2. Overview

Price Duplication occurs if prices which for the same Data Recipient, under very specific conditions, overlap geographically and temporally. 'Very specific conditions' indicate what determines two or more equivalent prices that must then be checked for geographical and temporal overlap.

Validations around Price Duplication will be based on both geographical and temporal (start / end date) overlap. These validations will only be checked against pricing for recipients who have indicated that they require the prevention of duplicate pricing.

Note that for clarity in this document, a Price Type being added or modified (changed or corrected) either online or via M2M is known as the '**input price**'. Any price currently in the suppliers' catalogue is referred to as the '**existing price**' (there may be 0...many of these).

Also, it is a requirement for duplicate checking of the input prices to occur across the input prices within an upload file, in addition to duplicate checking the input prices against the prices already existing in the DSE Data Pool database. A Supplier must be able to end-date a price and also add a new price in the same upload.

For the rest of this document, where the expression 'equivalent existing price' is used, it should be interpreted as 'equivalent existing price or equivalent price within the same load file' (see section 10.6.1 for definition of price equivalence).

Price Relationships do not undergo price duplication checking.

10.6.3. Validations to Prevent Price Duplication

The following rules apply for Price Type segment maintenance when processing prices for Recipients that require Price Duplication checking.

Price Duplication can only occur between equivalent prices. There are three steps to checking for duplicate prices, each of which is explained in detail in subsequent sections.

NOTE: In regards to the Price Types checked, only parent Price Types, i.e. Price Types that have an Application Sequence Number of '1', are to be considered for Price Duplication Checking. This excludes Price Types of 'ALLOWANCE' or 'CHARGE'.

For each Price Type added or modified (change or correct) via M2M or the web user interface, the following steps must occur to check for duplicate pricing:

1. Does the input price contain any conditions under which price duplication checking does not occur?
    a. If yes, continue with normal price processing.
    b. If no, go to step 2.
2. Do equivalent prices exist?
    a. If yes, go to step 3.

b. If no, continue with normal price processing.

At this point, the process must loop through all equivalent existing prices until price duplication checking has been performed for each equivalent existing price found.

3. For each equivalent existing price found, does the existing price contain any conditions under which Price Duplication checking does not occur?
    a. If yes,
        - Fetch the next existing price.
        - Return to step 3.
    b. If no, go to step 4.
4. Is there **geographical overlap** between the input price and the current equivalent existing price selected?
    a. If yes, then continue to step 5 to check for temporal overlap. It is fine for a price to have geographical overlap and not temporal overlap. It is not fine for a price to have both.
    b. If no,
        - Fetch the next existing price.
        - Return to step 3.
5. Is there **temporal overlap** between the input price and the current equivalent existing price selected?
    a. If yes, then continue to step 6 to check for bracket overlap.
    b. If no,
        - Fetch the next existing price.
        - Return to step 3.
6. Is there a **bracket overlap** between the input price and the current equivalent existing price selected?
    a. If yes, fail the price type being added or modified.
    b. If no, and this is the last equivalent existing price in the loop, continue with normal price processing.
    c. If no, and this is not the last equivalent existing price in the loop
        - Fetch the next existing price.
        - Return to step 3.

Figure 14: Price Duplication Checking

10.6.4. Conditions under which Price Duplication Checking does not occur

Whether or not a Supplier price for a Recipient requiring duplicate price checking is the input price or an existing equivalent price, if either price meets any of the following criteria, the price CANNOT be considered for Duplicate Price checking.

If the **input** price meets at least one of the following conditions, Duplicate Price checking need not be performed. In addition to the below conditions, if the **input** price has non-null Price End Date value (regardless of Start Date value) between NOW and “NOW+48 hours” (where NOW is the instantaneous processing time for this input price), then the price is excluded from Duplicate Price checking.

If an **equivalent existing** price meets at least one of the following conditions, it will be skipped for Duplicate Price checking with the input price. (See next section for equivalence checking between the input and existing price).

The price is **excluded** from Duplicate Price checking if the price:

1. is deleted (via Action Code “DELETE”)
2. has Price Application Sequence > 1
3. has more than 1 type of ‘location’ information populated at the same time from any of ‘Alternate Location Grouping’ + ‘Ship To’ + ‘TM-SD’
4. has more than one Effective Start Date/Time populated
5. has more than one Effective End Date/Time populated
6. Effective Start Date/Time Context is **not** ‘FIRST_ORDER_DATE’
7. Effective End Date/Time Context is **not** ‘LAST_ORDER_DATE’
8. has equal Effective Start Date/Time and Effective End Date/Time (zero duration)
9. has a past Effective End Date/Time (historic price).
   This can only occur on an existing price being considered for Duplicate Price checking as a new price cannot be added with a past End Date or modified to set a past end date.
10. has more than one bracket
11. Bracket Qualifier (if present) is not ‘MEASUREMENT_RANGE’

NOTE: The order of exclusion checking in the list above does NOT imply the order in which these checks should be executed. Each condition alone causes a price to be excluded from Duplicate Price checking. Thus, the first condition found to be true excludes the input or existing price being checked from Duplicate Price checking and no other conditions need to be checked for that price.

10.6.5. Equivalent Price Checking

A price is **'equivalent'** to another price if and only if they share the same 'null' or 'not null' values for the following attributes:

Attribute	GDSN Attribute Name	Comment
GTIN	<itemDepictionQualifier> <catalogueItemReference> <**gtin**>	The GTIN, GLN, TM, TM-SD must match exactly for a price to be considered equivalent with another price.
Data Source GLN	<itemDepictionQualifier> <catalogueItemReference> <**dataSource**>	
Target Market	<targetMarket> <**targetMarketCountryCode**>	
Target Market Subdivision	<targetMarket> <**targetMarketSubdivisionCode**>	
Recipient GLN	<partyReceivingPrivateData>	
Price Sequence	<priceTypeApplicationSequence>	Must be '1'. The price will already have been excluded if application sequence is not '1'
Price Type	<priceTypeCode>	
Price Basis Quantity	<priceValueInformation> <priceBasisQuantity> <**value**>	Null decimal considered identical to absence of decimal (i.e. 1 = 1.000)
Price Basis Quantity UOM	<priceValueInformation> <priceBasisQuantity> <**unitOfMeasure**>	
Price Value Type	<priceValueInformation> <**priceValueType**>	

The following attributes are configurable (by Recipient) to be included in the equivalence check.

Optional Attributes

Attribute	GDSN Attribute Name	Comment
Price Type Description	<priceTypeDescription>	Case insensitive match
Distribution Method Code	<distributionMethodCode>	
Price Action Reason	<priceActionReason>	
Reference Doc ID + Desc	<referenceDocumentInformation> <**referenceDocumentIdentifier**> <referenceDocumentInformation> <referenceDocumentDescription> <**text**>	Case insensitive match of both attributes
Relationship ID	<priceSynchronisationRelationshipIdentification**>**	

If the configuration is changed, newly added or modified prices are checked against the changed configuration from that point of time where the configuration change is saved in the system. No retrospective check across existing price data when (and if) the Recipient's equivalence requirements change.

It is to be specifically stated that price 'equivalence' takes into **no account**:

- Action Code for Price ("ADD", "CORRECT", "CHANGE_BY_REFRESH")
- Price Value
- any other price attribute now (or added later), unless otherwise stated

NOTE: A price is never 'equivalent' to itself, which is important for the purpose of price Change / Correct actions.

10.6.6. Checking Prices for Geographical Overlap

If an input price is equivalent to one or more existing prices, then the first Duplicate Price check performed is to determine whether or not there is geographical overlap. This check is being performed between the input price and every existing equivalent price as well as every other input price in the same load file for the same item.

A price has **'Geographical overlap**' with an **'equivalent'** price, if they have 1 (or more) shared 'Target Market Sub-divisions' or 'Ship To GLNs' or 'Alternate Location Groupings' – that is to say the applicable geographical regions for the price overlap wholly or partially. There is one exception to this rule which is noted below where TM-SD and ShipTo for a price are both <null>.

Attribute	GDSN Attribute Name	Repeats
Target Market Subdivision	<priceTargetMarketSubdivision>	Yes
Alternate Location Grouping	<alternateLocationGrouping>	No
Ship To	<shipTo>	Yes

An input price can be constructed in 8 scenarios for TM-SD, Alternate Location Grouping, and Ship To (as below) - the same scenarios apply for an existing price.

Scenarios

Scenario	TM-SD	Alternate Location Grouping	Ship To	National Pricing
1	<null>	<null>	<null>	Yes
2	populated (1..*)	<null>	<null>	No
3	<null>	<null>	populated (1..*)	No
4	<null>	populated	<null>	No
5	populated (1..*)	populated	<null>	Excluded (*)
6	populated (1..*)	<null>	populated (1..*)	Excluded (*)
7	<null>	populated	populated (1..*)	Excluded (*)
8	populated (1..*)	populated	populated (1..*)	Excluded (*)

(*) Scenarios 5 - 8 are explicitly excluded from Price Duplication check for either ‘input’ or ‘existing’ prices as this is an invalid business case in most pricing communities as only 1 set of TM-SDs or Ship To GLNs or Alternate Location Grouping should be populated for any 1 price.

Each of the 4 valid input price scenarios for TM-SD, Alternate Location Grouping, and Ship To needs to be cross-referenced with the same 4 valid existing price scenarios; in total 16 discrete Use Cases (see table below). The final column in the combined table shows whether geographic overlap occurs.

Geographical Overlap

Use Case	Input Price Scenario	Existing Price Scenario	Geographic Overlap
1	1	1	**Yes**
2	1	2	**Yes**
3	1	3	**Yes**
4	1	4	**Yes**
5	2	1	**Yes**
6	2	2	**Possible, if values are the same (set intersection non-empty)**
7	2	3	No
8	2	4	No
9	3	1	**Yes**
10	3	2	No
11	3	3	**Possible, if values are the same (set intersection non-empty)**
12	3	4	No
13	4	1	**Yes**
14	4	2	No
15	4	3	No
16	4	4	**Possible, if values are the same (set intersection non-empty)**

NOTE: It is important to realize that the absence of TM-SD and Ship To (null for both attributes) is interpreted in Australia / NZ as price applies to the 'entire' Target Market (that is all Australia or all NZ).

10.6.7. Checking Prices for Temporal Overlap

Once 'Geographical Overlap' has been established between an input price and an existing price, then '**Temporal Overlap**' must be established.

A price must have both geographical and temporal overlap to be considered a Duplicate Price. It is fine for the input and existing prices to have 'Geographical Overlap' if they do not have 'Temporal Overlap'.

Example: A $10 List Price for TM-SD 'Queensland' clearly has 'Geographical Overlap' with an 'equivalent' $11 List Price for TM-SD 'Queensland', but if one price only applies for calendar year 2012 and the other only for calendar year 2013, then there is no 'temporal overlap'. Thus, these are not Duplicate Prices

'Temporal Overlap' is a little more complex to establish than 'Geographical Overlap'.

Attribute	GDSN Attribute Name	Valid Context Type
Effective Start Date/Time	<priceTypeEffectiveStartDate> <effectiveStartDateTime>	FIRST_ORDER_DATE
Effective End Date/Time	<priceTypeEffectiveEndDate> <effectiveEndDateTime>	LAST_ORDER_DATE

Prior to checking temporal overlap, the exclusions and equivalent price checking have confirmed that the input price and existing price both contain only 1 set of Start and End Dates. All Start Dates are FIRST_ORDER_DATE Context Type and all End Dates are LAST_ORDER_DATE context type.

Of 5 total scenarios, there are 4 valid scenarios for the way in which an input price might be constructed for Start and End Date/Times as below noting the following:

- Start Date/Time are required, thus scenarios without Start Date/Time do not have a use case below.
- Date/Time can only be Historic (H) or Future (F) at the time a load file is being processed by DSE Data Pool. The notion of 'current date' or date TODAY has no meaning because this only applies instantaneously. Thus use cases only consider historic (past) or future dates.

The following use cases assume that all prior checking has confirmed that the input and existing price are equivalent prices that pass requirements for Duplicate Price checking and have geographical overlap.

Scenarios

Scenario	Start Date	End Date	Conditions
1	H	<null>	
2	H	H	Invalid use case as a price cannot be added with both a historic start and end date, nor can it be modified to set the end date to a past end date. Thus an **input** price can never have a historic end date.
3	H	F	
4	F	<null>	
5	F	F	End Date >= Start Date (both are future)

NOTE: A <null> end date is a Future end date set at infinity. In other words, it will always occur further in the future than a Future end date. This distinction is important in establishing when there is Possible vs. Definite overlap.

There are 5 valid scenarios for the way in which an existing price might be constructed for Start and End Date/Times, as below. The reason there are 5 (and not 4) valid scenarios is that an existing price may have an historic end date (which is not possible for an input price).

Each of these 4 input price scenarios needs to be cross-referenced with the 5 existing price scenarios; in total 20 discrete Use Cases (see table below).

Temporal Overlap

Use Case	Input Start Date	Input End Date	Existing Start Date	Existing End Date	Temporal Overlap
1	H	<null>	H	<null>	**Yes**
2	*H*	*<null>*	*H*	*H*	*Ignore (*)*
3	H	<null>	H	F	**Yes**
4	H	<null>	F	<null>	**Yes**
5	H	<null>	F	F	**Yes**
6	H	F	H	<null>	**Yes**
7	*H*	*F*	*H*	*H*	*Ignore (*)*
8	H	F	H	F	**Yes**
9	H	F	F	<null>	Possible
10	H	F	F	F	Possible
11	F	<null>	H	<null>	**Yes**
12	*F*	*<null>*	*H*	*H*	*Ignore (*)*
13	F	<null>	H	F	Possible
14	F	<null>	F	<null>	**Yes**
15	F	<null>	F	F	Possible
16	F	F	H	<null>	**Yes**
17	*F*	*F*	*H*	*H*	*Ignore (*)*
18	F	F	H	F	Possible
19	F	F	F	<null>	Possible
20	F	F	F	F	Possible

NOTE: 'Possible' means: If date intervals overlap (for each 'Possible' use case there is a positive and negative example).

NOTE: Duplication does not occur where temporal overlap between an input price and an existing price is 'wholly historic' based on timestamp, not just date (all overlap is in the past meaning the overlap period ends before today – this second).

NOTE: Temporal overlap, where it does occur, is defined to be non-zero duration. This means an input price starting at 00:00:00 does not overlap temporally with an existing price ending at 00:00:00 the same day.

10.6.8. Checking Prices for Bracket Overlap

If there is a geographical and a temporal overlap between an input price and an existing price, then '**Bracket Overlap**' must be established.

Just like the absence of TM-SD, ALG and Ship To means that the 'superset' NATIONAL geographic region is defined, similarly the absence of Brackets means the price has the 'virtual' definition of having 'infinite' brackets – in other words a price without any Brackets is deemed to have Brackets from minus infinity to plus infinity; thereby creating possible overlap scenarios with those prices which do have Brackets defined.

Example:

- NATIONAL $10 LIST_PRICE for GTIN(x) 2013-01-01 to 2013-12-31 (no Brackets)
  vs.
- NATIONAL $12 LIST_PRICE for GTIN(x) 2013-01-01 to 2013-12-31 for brackets 1-10

This is a case of Price Duplication because for units of GTIN(x) from 1 to 10 there are 2 possible prices.

In order to test for 'Bracket Overlap' two steps must be performed:

1. Check Bracket UOMs.

The possible maintenance combinations create three valid scenarios (Input Price UOM Bracket = Existing Price UOM Bracket).

Scenarios

Scenario	UOM Bracket Min	UOM Bracket Max	Comment
1	<null>	<null>	
2a	populated	<null>	
2b	<null>	populated	Invalid
3	populated	populated	

Each of these 3 input price scenarios needs to be cross-referenced with the 3 existing price scenarios; in total 9 discrete Use Cases (see table below).

Bracket Comparison

Use Case	Input Price Scenario	Existing Price Scenario	Bracket Comparison Possible
1	1	1	Yes
2	2a	1	Yes
3	3	1	Yes
4	1	2a	Yes
5	2a	2a	Yes, if UOM Min equal
6	3	2a	Yes, if UOM Min equal
7	1	3	Yes
8	2a	3	Yes, if UOM Min equal
9	3	3	Yes, if UOM Min/Max equal

2. If UOMs are the same, check the Bracket min/max values.

Bracket Overlap

Use Case	Input Price Scenario	Existing Price Scenario	Bracket Overlap
1	1	1	Yes
2	2a	1	Yes
3	3	1	Yes
4	1	2a	Yes
5	2a	2a	Yes
6	3	2a	Possible
7	1	3	Yes
8	2a	3	Possible
9	3	3	Possible

NOTE: 'Possible' means: If bracket intervals overlap (for each 'Possible' use case there is a positive and negative example).

11. Message grouping

The GDSN choreography distinguishes between four types of GDSN response messages:

- Catalogue Item Registration Response (positive message)
- Party Registration Response (positive message)
- GS1 Response (positive message)
- GS1 Exception (negative message)

Understanding GDSN Response Messages

Two types of messages, the **Catalogue Item Registration Response** and the **Party Registration Response**, are sent exclusively by the Global Registry to a GDSN Data Pool. These messages confirm that a request has been accepted. For customers connected to the GDSN, only the **GS1 Response** and **GS1 Exception** messages are relevant for day-to-day operations.

Validation Reports

Customers can choose to receive a single validation report for each message they send, even if that message contains multiple hierarchies. This report includes all validation information for every hierarchy.

- A **GS1 Response** message is sent for all items that are correct.
- A **GS1 Exception** message is sent for all items that have errors.

Handling Multiple Transactions

When a **Catalogue Item Notification (CIN)** XML message with multiple transactions comes from another Data Pool, customers have two options for how they receive it:

1. **Split Messages:** The data pool can split the single message into multiple messages, with each one containing a single transaction. Customers who choose this option will receive a separate validation report for each transaction.
2. **Grouped Messages:** Customers can choose to receive all transactions in a single, grouped message. The maximum number of transactions per message can be configured for each customer's Global Location Number (GLN).

Please contact the Access Management team to have the options reflecting your needs applied to your GLN as our default setup might vary from customer needs.

12. "In Network" vs. "Out of Network" Data Pools

When a party's "IN Network" status is set to **false** in the DSE Data Pool, it means they are **not** participating in the broader GDSN network. This configuration prevents them from exchanging data with trading partners who use other GDSN data pools.

Instead, these "out of network" parties can only exchange data with other suppliers or retailers who are also part of the DSE Data Pool community.

As a result:

- Data from DSE Data Pool suppliers is **not** registered in the Global Registry.
- DSE Data Pool retailers' subscriptions are **not** stored in the Global Registry.

This setup is common for local groups, such as the German AGRO community. Their members, who are all part of the DSE Data Pool, prefer to keep their data exchange local and do not want it shared globally.

13. Batch Processing

Data recipients can enable **M2M batch processing** and set a specific interval for their profile, known as the "Subscription Frequency." This can be as frequent as every five minutes, every hour, or even once a day.

When the scheduled processing time is reached, the system packages and sends the latest version of all new and changed items to the data recipient. The data is grouped into messages based on the recipient's configured maximum transaction limit (e.g. 100 per message). Alternatively, recipients can choose real-time processing instead.

How Batch Processing Works

The diagram below illustrates a batch process with a 7-hour interval.

- **Hour 1:** The data sender sends a new item (**GTIN1**).
- **Hour 3:** The sender sends an update for **GTIN1**.
- **Hour 6:** The sender sends another update for the same item.

When the processing time is reached at **Hour 7**, the DSE Data Pool will only send the **latest version** of **GTIN1** to the data receiver. In this example, that would be the third update, which was received at Hour 6.

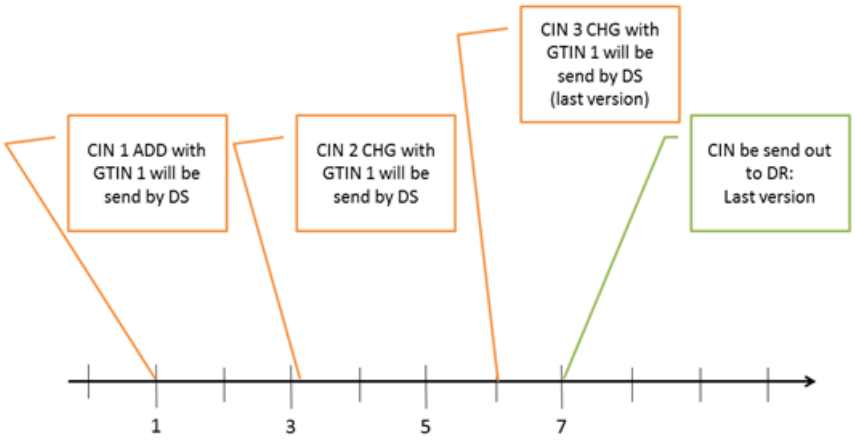


Figure 15: Example Batch Processing: 7 hours

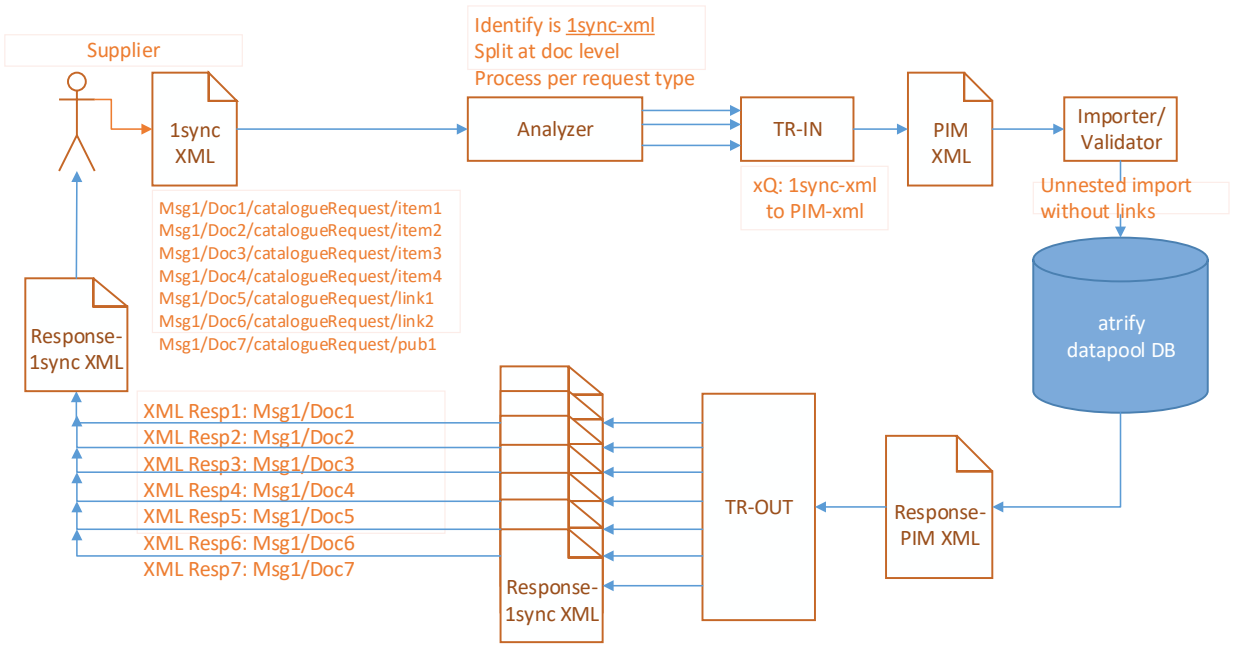
Please contact the support team if you want to set up a special Subscription Frequency interval.

14. 1SYNC XML Interface Support

DSE Data Pool supports regular standard GDSN BMS message types and choreography. In addition, the Data Pool can support the basic 1SYNC XML message choreography. To activate the 1SYNC XML flow for your GLN get in touch with the 1WorldSync, by Syndigo Support Team or your assigned contact.

14.2. How the 1SYNC XML Process flows

Below illustration shows how the 1SYNC XML workflow works for the item, link and publication scenarios. Also, the response mechanism is shown here:

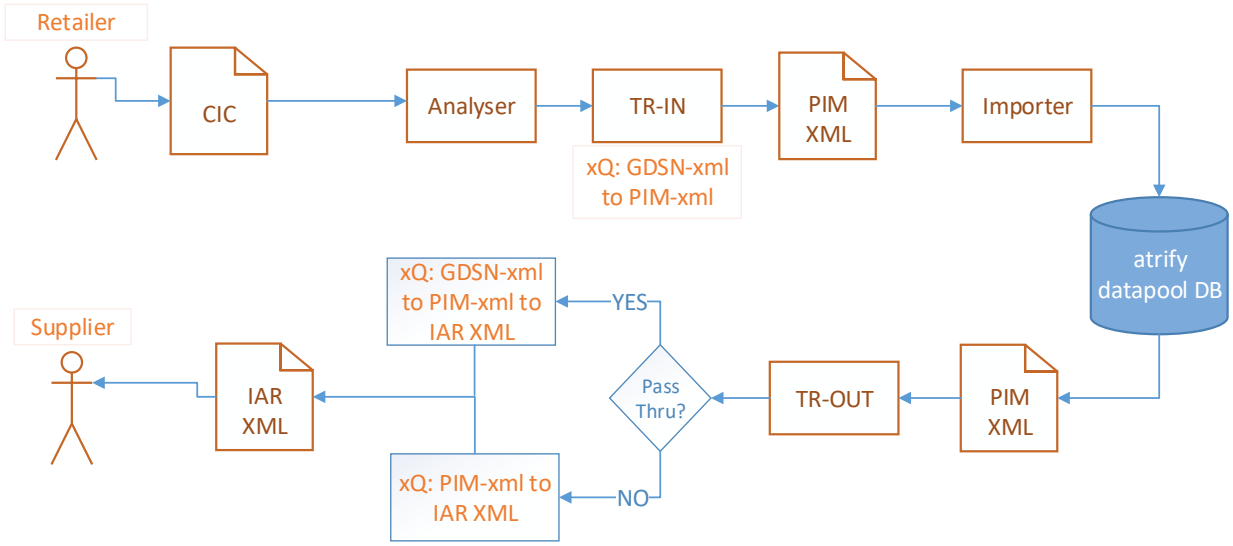


The diagram depicts the following scenario:

1) Data Source (Supplier) sends new item add as 1sync XML to the DSE Data Pool. Message may contain single catalogue requests of type item and/or link and/or publication. If many catalogue requests are sent in one message, they will be structured per message id / document id. Processing of the multiple requests will happen per request type. Means first all items will be processed, then links and then publications.
2) The analyzer component will receive the xml file and will recognize as 1sync XML format. Then the 1sync message handler will split the messages per document level and send to the Translator-in (TR-IN) component. The translator will trigger the xQuery mapping which will generate the native Data Pool PIM-XML file.
3) The Importer will process the PIM-XML file as unnested hierarchy and hand over to the validator to get the validation result. In success case Data Pool will store the unnested hierarchy level without the link information.
4) The importer will receive the good / error response and hand over to the Translator-out (TR-OUT) component. The translator will trigger the xQuery mapping to generate a response file in 1sync XML format.

5) NOTE: The Data Pool validator is using GDSN attribute names to express the error details. 1WorldSync, by Syndigo will send these GDSN attribute names to the supplier back.
6) Per each request type the above process steps will be executed. As a result, a response message will be sent to the supplier referring to all documents send in the original message.

Next illustration shows how the process for recipient feedback with 1SYNC XML IAR (Item Authorization Response) messages associated to the GDSN CIC works. Simply the process is like the above scenarios. We will get GDSN CIC messages and convert to IAR messages:



14.3. Supported Attributes and Message Types

The interface supports attributes on demand. Current focus lies on Healthcare FDA, NHS and FMCG for Consumer Electronics. The attribute scope will be enhanced based on customer demands.

Message Request Types

- Item
- Link
- Publication

Message Response Types

- Acknowledgement Response
- Exception
- IAR

14.4. How to Track&Trace 1SYNC XML messages

To track 1SYNC XML messages go to menu “Data Sync / Track Messages” and check for one of the following document types:

- CR: catalogueResponse

- CRQ: catalogueRequest (Item, Link, Pub)
- IAR: itemAuthorisationResponse

14.5. Further Notes

- Attribute naming in responses and CIC/Item Authorisation messages are based on the GDSN + FMCG names
- Any attributes that are not part of the mapping scope will be ignored. Please make a change request if further attributes are needed.

15. Special DSE Data Pool Features

DSE Data Pool offers some add-on features as described in the following chapters. To get these features please get in touch with the 1WorldSync, by Syndigo Support Team or your assigned contact.

15.2. Hybrid Client

Support for Hybrid Client

The DSE Data Pool now offers a feature for **Hybrid Clients** that combines machine-to-machine (M2M) data loading with manual data maintenance. This allows M2M suppliers to load their initial item data in XML format (BMS/1SYNC) to DSE Data Pool. We ensure to copy all the data into a Publishing instance, where the data can then be manually maintained but also new products be added.

Key Details for Hybrid M2M Suppliers

- **Data Maintenance:** Once an item is loaded, any further updates must be made directly within the Publishing platform. If a supplier sends new updates via M2M, those changes will overwrite any manual edits made in Publishing.
- **Data Release:** Valid item data is immediately released in Publishing once the **CIN** (Catalogue Item Notification) message is processed.
- **CIN Messages:** Items are sent out as CIN messages as soon as they are released in Publishing, not just upon initial publication.
- **Handling Invalid Data:**
    - **Invalid Items:** If an item causes an exception in the DSE Data Pool, its data will be placed in a "working state" within Publishing for correction.
    - **Corrupt Data:** Data that is corrupt (e.g., missing a primary key like GTIN/GLN/TM) will not even be imported into Publishing.
- **Prices:** Only **valid price data** will be imported into the hybrid Publishing system; invalid price data will not be imported at all.

The Hybrid Copy Feature

The **Hybrid Copy** feature allows the DSE Data Pool to copy existing item and price data from M2M (machine-to-machine) suppliers into the Hybrid Publishing Interface. This is a convenient way for suppliers to get their previously stored data into the manual editing environment of Publishing.

Typically, data from a Hybrid Client M2M supplier is routed directly to the standard M2M process on DSE Data Pool. The copy can be performed for:

- **An entire supplier's data** (by their GLN)
- **Single hierarchies**
- **Specific lists of GTINs**

Important Note: The Hybrid Copy feature only works for **CIN**, **CIP**, and **PSD** messages. It does **not** support copying **CIC** or **PSC** messages.

15.3. Data Pool Response - Reporting

The DSE Data Pool can generate a human-readable CSV file for any exceptions found in a **CIN** or **PSD** message. For M2M suppliers who enable this feature, a detailed CSV report is sent via email, in addition to the standard **GS1 Exception** message from the regular workflow.

This feature is particularly useful because the people managing item master data are often not the same people who handle EDI processes. By activating this service, suppliers can have a dedicated report sent directly to their master data manager's email address. Please contact Access Management to enable that feature and add the desired email addresses.

The report identifies three distinct types of errors:

- **Item Errors:** Problems related to the item's data itself.
- **Price Errors:** Issues with price data, excluding duplication problems.
- **Price Duplication Errors:** These errors are identified separately because they require a different, more detailed analysis.

DSE Data Pool offers party settings that go beyond the email exception feature. You can choose to activate or deactivate the "Accept Exception and/or Response" option. This allows a machine-to-machine (M2M) party to decide whether they want to receive standard GS1 Response or Exception messages. Please contact Access Management to enable that feature and add the desired email addresses.

15.4. Price Auto Publication

Price Auto Publication allows trade items automatically published to the Recipient declared in the Price message. After receiving a new price in the DSE Data Pool, all hierarchies for the referenced trade item will be identified and published based on the below conditions:

- If the hierarchy has not been published
- If the publication of a hierarchy has not been deleted.

This is not applicable for Price Relationship and applicable only for Price Segment with Action Code as “ADD”. Auto Publication with Price can be configured on Supplier level per Retailer. The Retailers benefit from this function as they always will get trade item data with prices, if prices exist.

15.5. Item Append

This feature allows DSE Data Pool suppliers to add new data to an existing item without overwriting the previous version. To use it, a supplier must set the document command header action code to **"APPEND."**

When the DSE Data Pool receives an "APPEND" command, it acts as a **"CHANGE_BY_REFRESH"** while also triggering the new append feature.

Here's how it works:

- The DSE Data Pool loads the existing data and merges it with the incoming data.
- **If a data attribute exists in the old version but is missing from the new one, the DSE Data Pool keeps the old attribute.**
- **However, if a data attribute exists in both versions** (for example, nutrient information), the **new content will completely overwrite the old content** for that specific attribute.

This feature is designed for both **M2M** and **M2M Hybrid** suppliers. It is **not** supported for suppliers who use the Publishing UI exclusively.

Hybrid Use Case

For Hybrid suppliers, an incoming CIN XML message is normally sent directly to the Hybrid Client Importer. When a CIN XML with an **"APPEND"** command is sent, the DSE Data Pool first merges the new data with the existing item record. The combined, "appended" version is then sent to the Hybrid Client Importer to be copied into the Publishing instance.

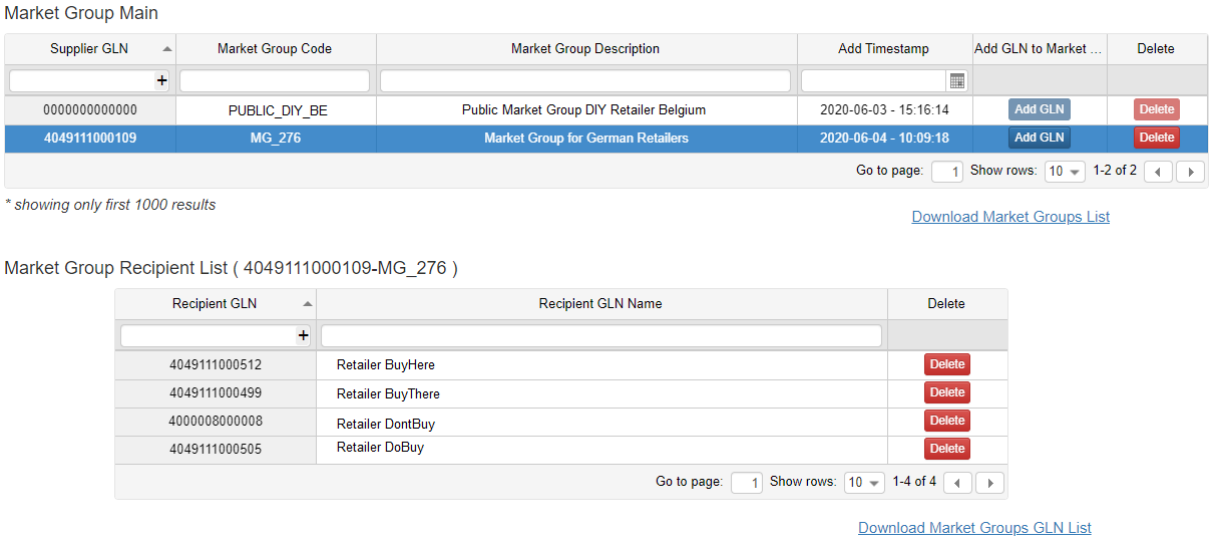
Note: The "APPEND" feature is **not** supported for the 1Sync XML choreography.

15.6. Publish to Market Groups

The DSE Data Pool allows you to publish data to a defined set of GLNs called a **"Market Group."** This feature goes beyond the standard GDSN functionality, which only supports publishing to a single target market or a single GLN.

How It Works

1. **Define a Market Group:**
   - First, you must create a market group.
   - Each group needs a minimum of two GLNs and can have up to 50.
   - To create a group, navigate to the **"Market Groups Main"** section in the Data Pool UI.
   - You'll need to define an uppercase, alphanumeric **Market Group Code** and add the recipient GLNs.
2. **View and Select Groups:**
   After you create your group, it will appear in the Market Group hitlist. Clicking on a row will show you a list of the recipients in that group. You will see both your own private market groups and any public groups that have been set up by DSE Data Pool administrators.



Publish to Market Group

After creating your market group codes, you can use them to publish to the appropriate market. Simply add the market group code to the "publishToTargetMarket" field in your standard CIP message.

Example:

```
<catalogue_item_publication:catalogueItemPublication>
   <creationDateTime>2019-12-12T14:27:30.010Z</creationDateTime>
   <documentStatusCode>ORIGINAL</documentStatusCode>
   <documentStructureVersion>3.1</documentStructureVersion>
   <lastUpdateDateTime>2019-12-12T14:27:30.010Z</lastUpdateDateTime>
   <catalogueItemPublicationIdentification>
      <entityIdentification>4cfd6df2-b5ed-45cc-8ffc-79518c25d403</entityIdentification>
      <contentOwner>
         <gln>4049111000109</gln>
      </contentOwner>
   </catalogueItemPublicationIdentification>
   <publishToTargetMarket>
      <targetMarketCountryCode>FMCG_DE</targetMarketCountryCode>
      <!-- Trigger for Market Group Publication Process -->
   </publishToTargetMarket>
   <catalogueItemReference>
      <dataSource>4049111000109</dataSource>
      <gtin>08901111831144</gtin>
      <targetMarketCountryCode>276</targetMarketCountryCode>
   </catalogueItemReference>
</catalogue_item_publication:catalogueItemPublication>
```

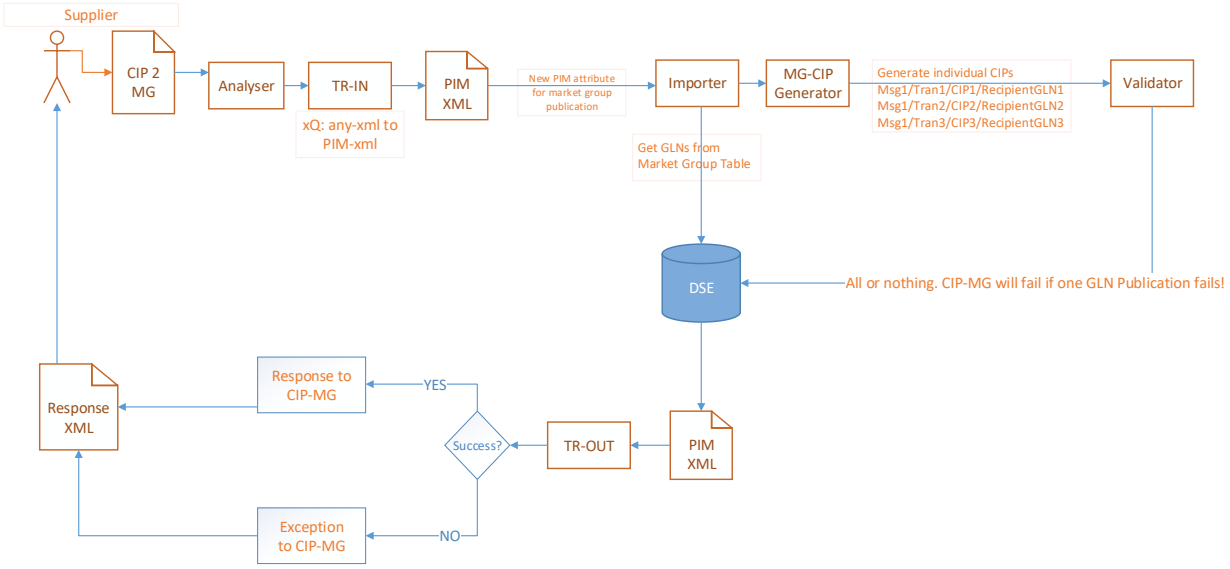
When you publish to a market group, the DSE Data Pool automatically creates a separate CIP message for each GLN in that group. Each of these individual messages is then validated.

A single response is sent back for the original market group publication message. All the auto-generated publications for that group are either accepted or rejected as a single unit. This means all individual GLN publications must be valid for the entire market group publication to be successful.
If even a single publication is invalid, the entire market group publication will be rejected, and you will receive an exception message detailing the specific error.

Editing Market Groups

- **Add GLNs from existing Market Groups**
    - Adding a new GLN to an existing market group will not reprocess all previously published items. It will be considered for future item publications only. If the supplier wants to have previously published items to be synced with the new recipient GLN a single CIP to GLN must be created for that new recipient.

- **Remove GLNs from existing Market Groups**
  - Supplier can remove GLNs from existing groups. For future item publications the deleted GLN will not be considered anymore when published to this market group. But for existing item the publication will remain. Deleting a GLN will not trigger a Publication Withdrawal/Delete message. This must be done by the supplier separately.
- **Delete Market Groups**
  - Supplier can delete the complete market group from the "Market Group Main" UI. This will remove the market group from the hitlist. When afterwards publishing to a deleted market group code the system will throw an error "Unknown Market Group Code". Again, deleting complete market groups will not delete the individual publications to the recipient GLNs. If needed those must be deleted separately.



Note: The "Market Group" feature is **not** supported for the 1Sync XML choreography.

16. History of changes

Date	Chapter / Page	Change / Enhancement / Innovation
April 2014	**Version 1.000**	
	Document first published April 2014,Version 1.0	
Created by	Nora Schuler & Sascha Kasper	
May 2014	**Version 1.100**	
	Chapter 6.1: Deleted E-Mail and valid formats. Chapter 10: Deleted E.Mail and XML-Upload. Chapter 11: Deleted Japan Out of Network aspects.	
Changed by	Sascha Kasper	
September 2014	**Version 1.200**	
	Chapter 4.2: Change sentence Chapter 6.2: Add overview message handling changes between WS2 and DSE Chapter 7.3: Stop service of CDN-message Chapter 7.4: Reset of Sync List by Data Source via CIP Delete Chapter 9.2: Switch on or off of validations per GLN isn´t possible Note: Handling of line breaks are not part of this documentation.	
Changed by	Sascha Kasper	
May 2015	**Version 1.300**	
	Chapter 8: New subchapter “Item hierarchy basic rules added” Chapter 10: New chapter “Price Synchronisation” added Appendix A – Error List DSE added	
Changed by	Selcuk Övüc	
July 2015	**Version 1.500**	
	Appendix A – Error List DSE updated	
	Selcuk Övüc	
June 2017	**Version 2.700**	
	Complete rework of the M2M Guide. Updated from BMS 2.7 to 3.1 (Major Release).	
	Appendix A – Error List DSE removed. Please refer to GDSN standard validation rule set.	
Changed by	Selcuk Övüc	

September 2019	**Version 3.0**
	Made changes to replace the 1WorldSync logo and name by 1WorldSync, by Syndigo logo and name.
Changed by	Selcuk Övüc
March 2020	**Version 3.1**
	Changed DSE naming to DSE Data Pool in the text
	Chapter 3: AS2 connectivity details updated.
	Chapter 14: New section for 1SYNC XML messaging added.
	Table2: List of important messages Updated the Catalogue Item Hierarchy Withdrawal explanation regarding deletions for target market publications.
Changed by	Selcuk Övüc
March 2020	**Version 3.1.1**
	Changed DSE naming to DSE Data Pool on images
Changed by	Selcuk Övüc
April 2020	**Version 3.1.2**
	Chapter 4.3. IsReload flag description updated.
Changed by	Selcuk Övüc
April 2020	**Version 3.1.3**
	Chapter 15.4. Item Append description updated. With 20.05 release m2m **and** hybrid supplier can use the item append feature.
Changed by	Selcuk Övüc
May 2020	**Version 3.2**
	New chapter 15.5 “Market Group Publication” added.
Changed by	Selcuk Övüc
August 2020	**Version 3.2.1**
	Figure 11: Unnested vs. Nested hierarchy diagram changed.
Changed by	Selcuk Övüc
Dec 2020	**Version 3.2.2**
	Chapter 15.5 “Market Group Publication” updated. Increased limit for Market Groups GLN to 50.
Changed by	Selcuk Övüc

Sept 2025	**Version 3.3.0**
	Rebranding to 1WorldSync, by Syndigo. Updated & rewrote multiple chapters.
Changed by	Dennis Van den Abbeel

Your input is valuable!

If you notice any mistakes or have suggestions for improvement, please reach out to our support team.

servicedesk@1worldsync.atlassian.net