GS1Trade Sync Data Pool - FTPS Service

Connectivity Guide

Version 1.0, Draft/Approved, 2018.08.05

Document Summary

Document Item	Current Value
Document Name	GS1Trade Sync Data Pool - FTPS Connection (Connectivity Guide)
Document Date	2016.03.03.
Document Version	1.
Document Status	Draft/Approved
Document Description	This document describes the FTPS-based connection used for GS1Trade Sync Data Pool system.

Contributors

Name	Organisation
Tibor Gottdank	GITM Kft.
Zsolt Jacsó	GITM Kft.

Log of Changes

Release	Date of Change	Changed By	Summary of Change
0.1	20/02/2016	Tibor Gottdank	Skeleton of document
0.2	23/02/2016	Tibor Gottdank	First draft
0.8	03/03/2016	Zsolt Jacsó	Chapter 4 5 6 updates
0.9	04/03/2016	Tibor Gottdank	Figure update
1	08/05/2018	Mads Blankenburg	New test URL

Disclaimer

GS1®, under its IP Policy, seeks to avoid uncertainty regarding intellectual property claims by requiring the participants in the Work Group that developed this **GS1Trade Sync Data Pool - FTPS Connection (Connectivity Guide)** to agree to grant to GS1 members a royalty-free licence or a RAND licence to Necessary Claims, as that term is defined in the GS1 IP Policy. Furthermore, attention is drawn to the possibility that an implementation of one or more features of this Specification may be the subject of a patent or other intellectual property right that does not involve a Necessary Claim. Any such patent or other intellectual property right is not subject to the licencing obligations of GS1. Moreover, the agreement to grant licences provided under the GS1 IP Policy does not include IP rights and any claims of third parties who were not participants in the Work Group.

Accordingly, GS1 recommends that any organization developing an implementation designed to be in conformance with this Specification should determine whether there are any patents that may encompass a specific implementation that the organisation is developing in compliance with the Specification and whether a licence under a patent or other intellectual property right is needed. Such a determination of a need for licencing should be made in view of the details of the specific system designed by the organisation in consultation with their own patent counsel.

THIS DOCUMENT IS PROVIDED "AS IS" WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NONINFRINGMENT, FITNESS FOR PARTICULAR PURPOSE, OR ANY WARRANTY OTHER WISE ARISING OUT OF THIS SPECIFICATION. GS1 disclaims all liability for any damages arising from use or misuse of this Standard, whether special, indirect, consequential, or compensatory damages, and including liability for infringement of any intellectual property rights, relating to use of information in or reliance upon this document.

GS1 retains the right to make changes to this document at any time, without notice. GS1 makes no warranty for the use of this document and assumes no responsibility for any errors which may appear in the document, nor does it make a commitment to update the information contained herein.

GS1 and the GS1 logo are registered trademarks of GS1 AISBL.

Table of Contents

1   Introduction

1.1   Purpose of Document

The GDSN Standard-specific FTP service is one of the three machine-to-machine interface technology[1] available for communicating with **GS1Trade Sync**.

Therefore, the **connectivity documentation** of GS1Trade Sync Data Pool contains three main parts.

This document specifies the connectivity details of **FTPS-specific communication** of **GS1Trade Sync Data Pool v1.0** system.

1.2   Document Conventions

This document structure is partially based on the specification standard of Rational Unified Process (RUP) methodology.

Within this specification, the terms SHALL, SHALL NOT, SHOULD, SHOULD NOT, MAY, NEED NOT, CAN, and CAN NOT are to be interpreted as specified in [1]. When used in this way, these terms will always be shown in ALL CAPS; when these words appear in ordinary typeface they are intended to have their ordinary English meaning.

The following typographical conventions are used throughout the document:

- ALL CAPS type is used for the special terms from [1] enumerated above.
- `Monospace` type is used to denote programming language, UML, and XML identifiers, as well as for the text of XML documents.

This document uses several abbreviations which long forms are located in Appendix.

1.3   Target Audience

The audience of this specification includes all assigned GS1Trade Sync Data Pool project members from both GS1 Denmark and GS1 Hungary, and the staff of developer companies assigned to the project on GS1 Hungary's authority.

Additionally, this document is intended for developers and testers who are familiar with the GDSN standard and who has general knowledge of other GS1 standards.

---

[1] There are WS-, AS2-, FTPS-based interfaces in GS1Trade Sync Data Pool system.

2   About FTPS

FTPS (FTP over SSL/TLS)[2] is an extension to the commonly used FTP that adds support for the SSL/TLS cryptographic protocol.

It uses a control channel and opens new connections for the data transfer. As it uses SSL/TLS, it requires a certificate.

Features of FTPS:

- Widely known and used

- The communication can be read and understood by a human

- Provides services for server-to-server file transfer

- SSL/TLS has good authentication mechanisms (X.509 certificate features)

- FTP and SSL/TLS support is built into many internet communications frameworks

---

[2] FTPS should not be confused with the SSH File Transfer Protocol (SFTP), an incompatible secure file transfer subsystem for the Secure Shell (SSH) protocol. It is also different from FTP over SSH, the practice of tunneling FTP through an SSH connection.

3   Overview

The FTPS-based connection ensures the appropriate communication between GS1 partner and GS1Trade Sync Data Pool.

As you see on Fig. Fig. 3-1, the communication between GS1 partner (DS or DR) and DP is performed in form of XML messages.

Partners are able to upload messages to FTPS Storages, in order to be processed by the server. Every partner using FTPS interface has their own storage. Communication between FTPS partner and Data Pool / GDSN Network members are done using specific FTPS folders.

The FTPS communication between DP and partners corresponds to GS1 XML standard [2].

Note: In order to communicate properly between DP and GS1 partner, GS1 partner should install FTPS client.
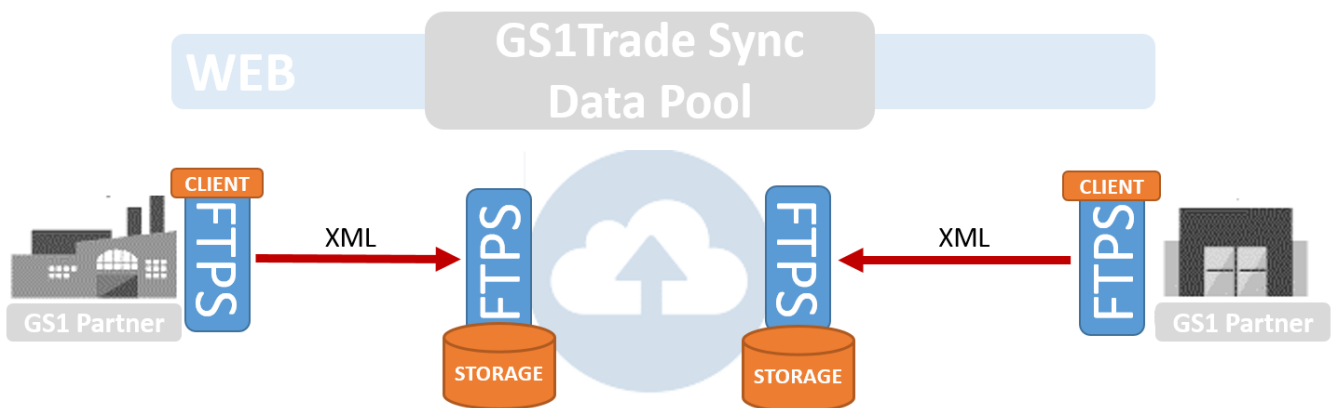

Fig. 3-1. Overview of FTPS-based communication between GS1 partners and GS1Trade Sync Data Pool

4   Details of FTPS Connection

Next section describes the process of FTPS-based connection between GS1 partner and GS1Trade Sync Data Pool (Fig. 4-1.).
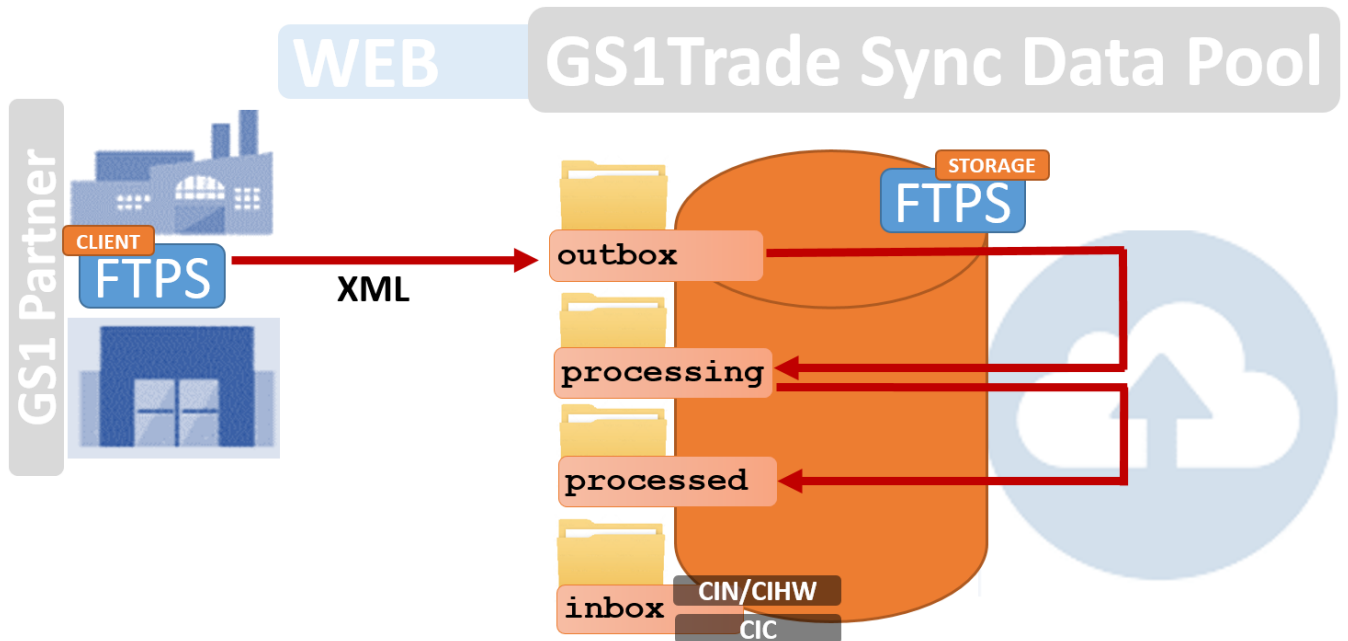

Fig. 4-1. FTPS-based communication process

The major steps are as follows:

1.   Partner creates an XML message to process it by DP.

2.   Partner opens an FTPS connection to the DP to upload the message.

3.   Partner uploads the message to the **Outbox** folder of the FTPS storage.

4.   DP realizes a new message in **Outbox** folder and then starts to process it.

5.   Processing starts with renaming the file to ensure the uniqueness, then it will be moved to the **Processing** folder.

6.   Once the processing finishes the file and the response will be placed in the **Processed** folder.

7.   The processed message will stay in **Processed** folder. It can be accessed by partner. (Every request/response can read here through **History** function.)

Note: The **Inbox** is the folder within the DP FTPS storage to store communication elements between partners. It contains the CIN/CIHW messages for DR as well as CIC messages for DS.

5   Security

This chapter contains the security aspects and client connection details for communication with GS1Trade Sync's FTPS solution.

5.1   HTTPS-based Security Aspects

The server is configured to **FTP over TLS** (Transport Layer Security) **Explicit mode**.

Explicit security requires that the FTP client issues a specific command to the FTP server after establishing a connection to establish the SSL link. In explicit TLS the FTP client needs to send an explicit command (i.e. "AUTH TLS") to the FTP server to initiate a secure control connection. The default FTP server port is used.

Default port: 21

Data Exchange: The FTP protocol exchanges data using separate channels known as the command channel and data channel.

Data channel port range: 4000 – 5000

Note: Because FTP uses a dynamic secondary port (for data channels), many firewalls were designed to snoop FTP protocol control messages in order to determine which secondary data connections they need to allow. However, if the FTP control connection is encrypted using TLS/SSL, the firewall cannot determine the TCP port number of a data connection negotiated between the client and FTP server. Therefore, in many firewalled networks, an FTPS deployment will fail when an unencrypted FTP deployment will work. This problem can be solved with the use of a limited range of ports for data and configuring the firewall to open these ports.

5.2   Authentication

User authentication is done using the supplied username / password credentials.

The username should be set as the following pattern: Gln/Email address

Note: A company with GLN '5790001090159' and email 'user@email.com' should use the '5790001090159/user@email.com' string as username.

6   TEST Connection Parameters

Parameter name	Value
URL	*https://uat.gs1tradesync.dk/*
Default port number	21
Data port range	4000 – 5000
FTPS configuration	FTPS Explicit SSL
Client credentials	Username: gln/email address Password: user password

7   Appendix

7.1   Abbreviations

Abbreviation	Term
AS2	Applicability Statement 2
CIC	Catalogue Item Confirmation
CIHW	Catalogue Item Hierarchy Withdrawal
CIN	Catalogue Item Notification
DP	Data Pool
DR	Data Recipient
DS	Data Source
FTP	File Transfer Protocol
FTPS	FTP over SSL/TLS
SFTP	SSH File Transfer Protocol
SSH	Secure Shell
SSL	Secure Sockets Layer
TLS	Transport Layer Security
XML	eXtensible Markup Language

7.2   Glossary

CIC (Catalogue Item Confirmation) – It refers to GDSN-specific electronic communication from the DR to the DS indicating what action has been taken on the item. The confirmation process occurs in the recipient's data pool.

CIHW (Catalogue Item Hierarchical Withdrawal) – It is a business message used to transmit trade item information from DS or DP to DR with the GDSN with regards to a correction that is required to an item hierarchy that has already been synchronised.

CIN (Catalogue Item Notification) – It is a business message used to transmit trade item information from DS or DP to DR with the GDSN.

CIP (Catalogue Item Publication) – It is a business message standard used to distribute trade item information within the GDSN.

DR (Data Recipient) – It represents the demand side data. It can be a company that receives product information from a data source. This "company" could be a retailer, hospital, distributor, wholesaler, foodservice operator, group purchasing organization, government, etc.

DS (Data Source) – It represents the supply side data. It can be a company (supplier, manufacturer, distributor etc.) that enters product information into GDSN-based synchronisation systems that are sent to DRs.

FTP (**File Transfer Protocol)** – Standard network protocol used to transfer files between a client and server on a network. FTP is built on a client-server model architecture and uses separate control and data connections between the client and the server. FTP users may authenticate themselves with a clear-text sign-in protocol, normally in the form of a username and password, but can connect anonymously if the server is configured to allow it. For secure transmission that protects the username and password, and encrypts the content, FTP is often secured with SSL/TLS (FTPS).

FTPS (**FTP over SSL/TLS)** – An extension to the commonly used FTP that adds support for the TLS and SSL cryptographic protocols.

SSL/TLS – Cryptographic protocols designed to provide communications security over a computer network.

7.3   References

[1] ISO/IEC, "ISO/IEC Directives Part 2 - Rules for the structure and drafting of International Standards," ISO/IEC, 2011.

[2] GS1 "XML Transport Instruction and Response", Implementation Guide, GS1 GO, 2012.

[3] GS1 "Business Message Standard (BMS) Catalogue Item Sync, BMS Release 3.1.0", GS1 Global Office, GS1 AISBL, 2015.

7.4   List of Figures