B2BE

Business to Business e-Solutions

TRANSACTION DELIVERY NETWORK (TDN)

WWW.B2BE.COM

MY GTASS Training Materials

TDN Overview

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Revision History

Name	Date	Reason For Changes	Version
Sia Nga Ping	11/03/12	Initial document	1.0
Wan Nur Atiqqah	19/11/14	Update V2LoadBalancer section	1.1

1.0 Introduction to TDN

The B2BE Transaction Delivery Network (TDN) provides infrastructure, and environment to enable clients to transmit document and data between one another's back end business systems, with no human intervention, removing the need of paper documents, and manual processes (EDI). Key benefits of TDN:

- Optimize business processes to be electronic, not manual.
- Improve cost savings.
- Reduce environmental impact.
- Increase responsiveness and customer service.

1.1 Document Standards

In order to meet the demands on the business environment, B2BE TDN is capable to handle any kinds of document, the following are but a few:

- ANSI X12 (Any subset)
- Tradacoms (Any subset)
- UN/EDIFACT (Any subset)
- ASCII (Fixed field or delimited)
- CSV (Comma Separated Verification)
- OCR (Optical Character Recognition)
- cXML (commerce eXtensible Markup Language)
- XML (Any dialect)

and etc.

2.0 TDN Network

TDN is a broad term, which covering all the servers and processes involved in delivering transactions from one trading partner to another.

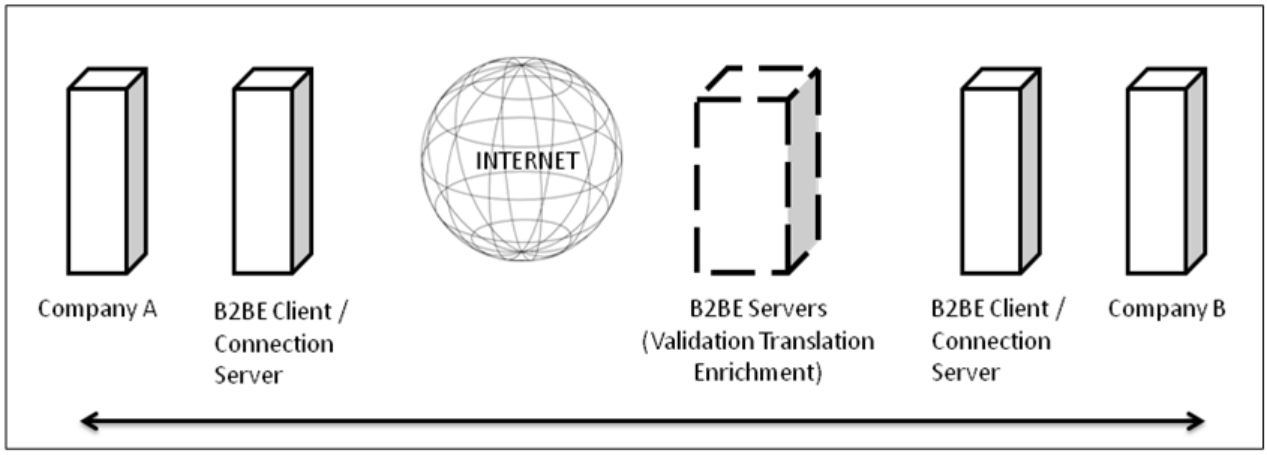

Figure 2.1 B2BE Transaction Delivery Network (TDN)

B2BE acts as a middle man between clients and their trading partners. From Figure 2.1:

- Company A would like to send their purchase order, in document format cXML to Company B which is using document format PDF.
- Translation of document format cXML to PDF is time and cost consuming, more man power in order to get the exact information if done in manually.
- With TDN, all the documents transmitted electronically:
  i. Company A uploads their business document through B2BE Client/Connection Server.
  ii. The files going into B2BE Servers, consisting Validation Translation Enrichment, controlled by our Translation to change the cXML into B2BEXML, validate the document information, and from B2BEXML converted into PDF.
  iii. Company B will receive the business document in PDF, through B2BE Client/Connection Server.

2.1 TDN Network Architecture

Figure 2.2 below shows the details of TDN Network architecture more precisely. When client is sending their documents in, we will first going through:

- 1st stage – Transmission Protocol, the ways enable users to send their files in.
- 2nd stage – V2DocHandler, handle the distribution of documents amongst the various Process Queues in server site.
- 3rd stage – Data Validation and Accuracy, through translations.
- 4th stage – Delivering the output to receivers through different channels.

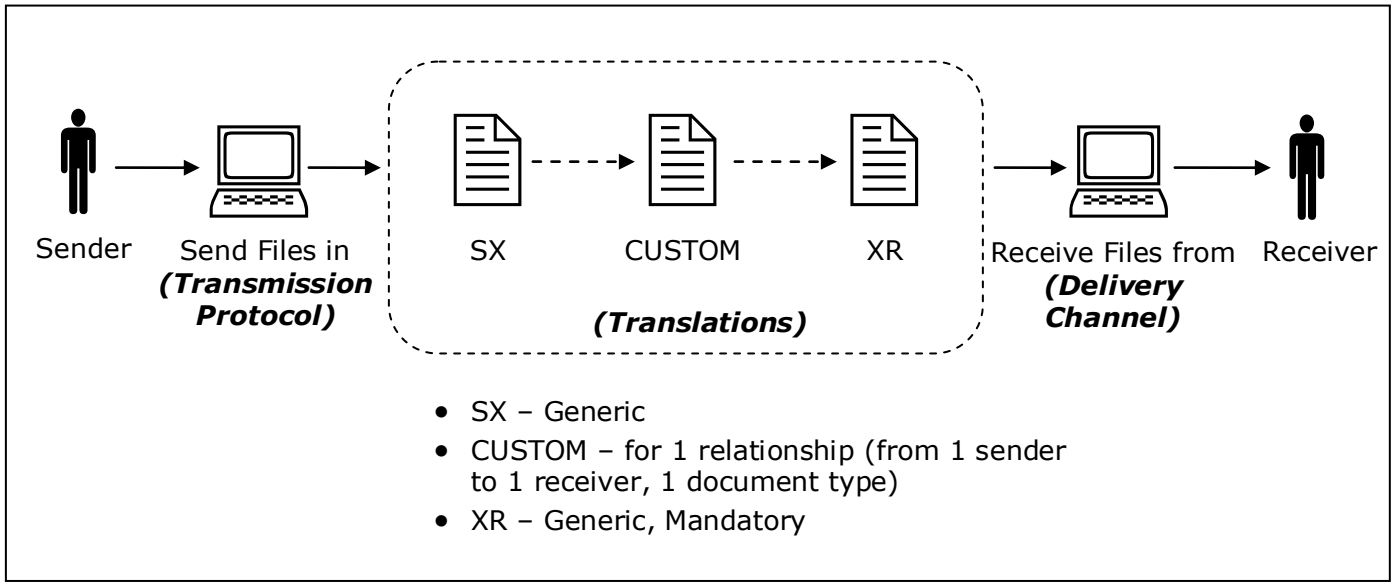

Figure 2.2 TDN Network Architecture

3.0 Transmission Protocol

Senders are able to send their business documents through network into B2BE server environment, to their trading partners. The transmission protocols accommodated at customer sites enable transmission of documents electronically, less cost or disruption to existing customer's process flows in their own companies.

Some of the followings are transmission protocols supported by B2BE:

- B2BE Client Application
- V2 Server
- AS2 Server
- HTTP/HTTPs
- FTP/SFTP
- Email - SMTP
- Fax
- Post

3.1 B2BE Client Application

B2BE Client software written internally by B2BE in C# .NET, providing an easy to use mechanism for clients, to deliver their business documents to and from B2BE Version 2 Server (V2 Server). B2BE Client was designed to work in a modular manner. For example, Addressing Header module will include B2BEHeader in every document, to clearly define the attributes of the files as an EDI document, and also for routing and tracking of documents through the TDN.

Every file that the B2BE Client interacts with is backed-up into the 'Backup' folder, for every stage: UPLOADED -> SX -> CUSTOM -> XR -> DELIVERED -> ACKNOWLEDGED.

3.2 V2 Server

It is named as "Version 2" server environment, come along with B2BE Client, is our second major iteration of our system. The V2 Server is the core of all B2BE document/transaction processing. It handles all the central processing, conversion of the documents, tracking them via entries in the database, and also provides the web interface for both customer and internal use.

B2BE Client and V2 Server play important roles for GTASS team in daily work routine, which enable us to perform end-to-end testing after we apply changes on translations. While V2 Server enables us to search the relevant documents, check user's account details, translation setup, relationship setup and etc.

Our V2 Server is in LIVE, UAT, TEST environment:

- LIVE – MEL02, for the documents transmission in live instantly
- UAT – MEL02UAT, for the testing purpose which connected to Customer's site before going to LIVE
- TEST – MEL02TEST, for GTASS to do testing onto the changes done in the translation.

Further information may refer to:

- http://intranet.b2be.com/mediawiki/index.php/V2_Server

3.3 AS2 Server

AS2 (Applicability Statement 2) defines how to transport data securely and reliably over the internet. Data consist of Electronic Data Interchange (EDI) message and any other message type. AS2 specifies how to connect, deliver, validate, and acknowledge data. It creates an envelope for a message which is sent securely over the Internet. The security is achieved by using digital certificates and encryption.

AS2 protocol uses HTTP or HTTPs as the transport method. Most companies just use HTTP.

Further information may refer to:

- http://intranet.b2be.com/mediawiki/index.php/AS2

3.4 HTTP/HTTPs

HTTP (Hypertext Transfer Protocol) or HTTPs (Hypertext Transfer Protocol over Secure Socket Layer) are one of the common ways used by Clients to deliver the documents to and from our B2BE server. Client, who usually owns their own website, will provide us specific URLs, and our network team GPSSS will need to do the connection setup, enabling the documents upload and retrieve by customers.

Further information may refer to:

- http://intranet.b2be.com/mediawiki/index.php/HTTP
- http://intranet.b2be.com/mediawiki/index.php/HTTPS

3.5 FTP/SFTP

FTP (File Transfer Protocol) or SFTP (Secured File Transfer Protocol), used to connect two computers over the internet. FTP is a commonly used protocol for exchanging files over any network which supports TCP/IP protocol (internet or intranet). The client's computer, running FTP client software initiates a connection to our server, to perform file manipulation operations including uploading files to our server, or download files from our server, and etc.

Further information may refer to:

- http://intranet.b2be.com/mediawiki/index.php/FTP

3.6 Email (SMTP)

Clients can choose to send or receive their files through email. The connection method is SMTP (Simple Mail Transfer Protocol), for inbound and outbound activities.

3.7 Fax

Clients can choose to receive their documents or error notification through fax. This connection method is only available for outbound activities, which are we will not receiving documents from clients through Fax.

3.8 Post

Clients can also choose to post their business documents in hardcopy to our company. AU, UK consultants will scan those documents, saved in pdf format, and delivered to our data entry center in Ipoh, Perak for MDP (Manual Document Processing). The data entry clerk will key in the important information into the system, and generate B2BEXML, send through our V2, via the translations and deliver the output to receivers.

Further information may refer to:

- http://intranet.b2be.com/mediawiki/index.php/Document_Digitization

4.0 V2LoadBalancer

V2LoadBalancer is used to handle the distribution of documents amongst the various Process Queues, as well as the actual creation of document entries in the database. This is to ensure a single point of entry for documents going into the system for processing. It is only be used by programs running on the V2 Server.

- When creating the document entry in the database, V2LoadBalancer will assign a unique internal ID (write into B2BE Header), and first action relating to the document.
- Multiple copies of the load balancer running and each of them monitoring a single input folder.
- The valid actions for putting a file into the system via V2LoadBalancer are:
  - UPLOADED
  - RESENT
  - CARBONCOPIED
  - CREATED
  - MODIFIEDANDRESENT
  - REDIRECTED
- It takes the document in its input folder, ascertains which process queues the document could be put in.
- Then it will find the process queue in available list, which has the least number of documents in it, and moves the document into Stage 1 of that process queue.

4.1 Process Queues

PQ is to allow us to process documents in parallel. Separate process queues allowed us to:

- place different process queues on different servers
- Allow easy expansion of server's capacity.

There are 12 process queues setup on one server with 4 stages in each queue:

- Each stage runs independently of the other stages.
- Able to process 48 documents at any one time to process 48 documents.

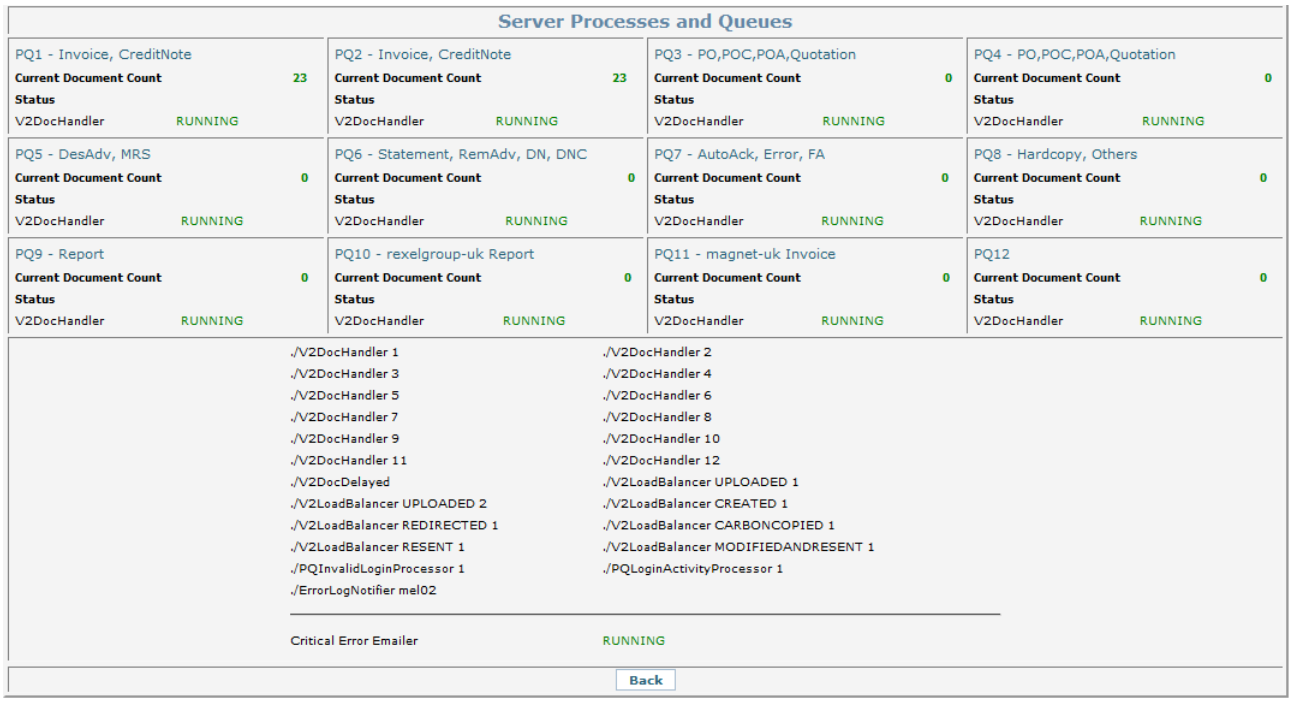

Figure 4.1 Process Queues

Every stage has a different process or action associated with it:

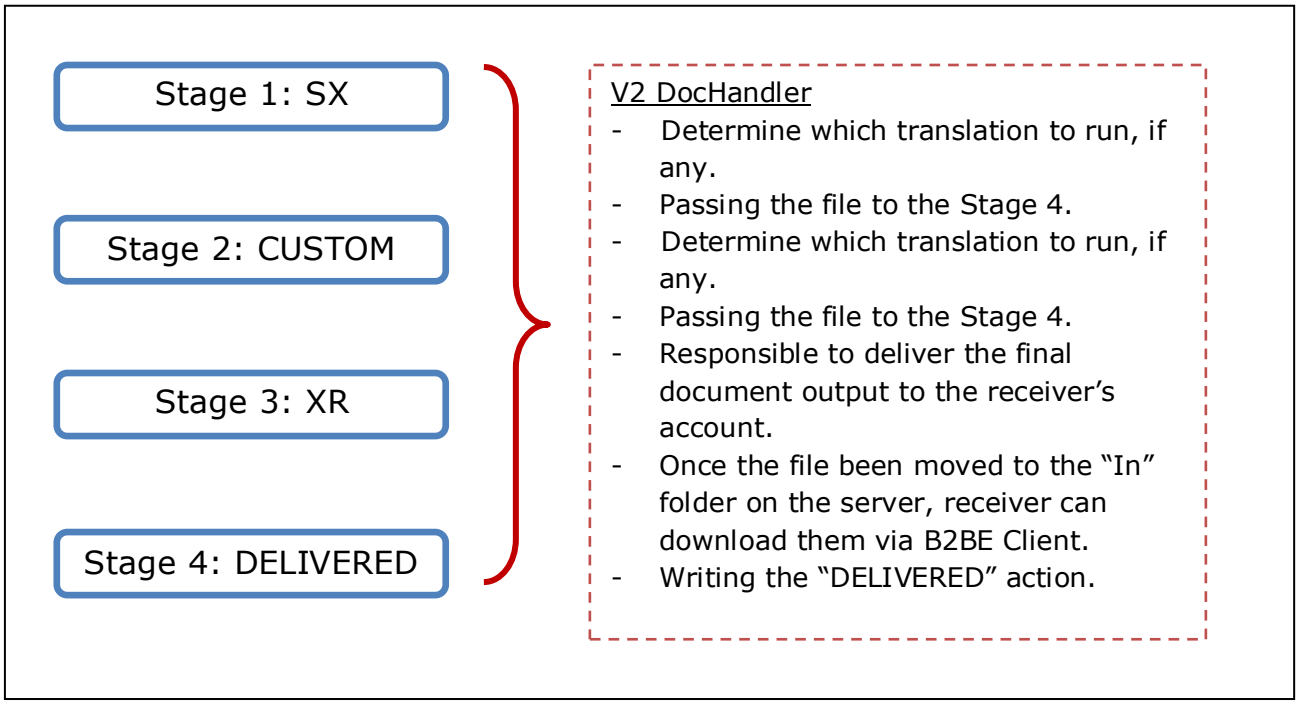

Figure 4.2 Process Queue in different stage

Further information may refer to:

- http://intranet.b2be.com/mediawiki/index.php/PQ_Load_Balancer

5.0 Translations

Translations are the programs that responsible for the bulk of the document processing on TDN system. It is in-charged for the data validation and accuracy onto the documents which sent in by customer, before delivered them out to the receivers.

For each customer, document type and file format, we need to write individual translation program, to convert the file from one defined format into another. The translation program is mainly written in C++, html, SQL languages.

The general process of translations:

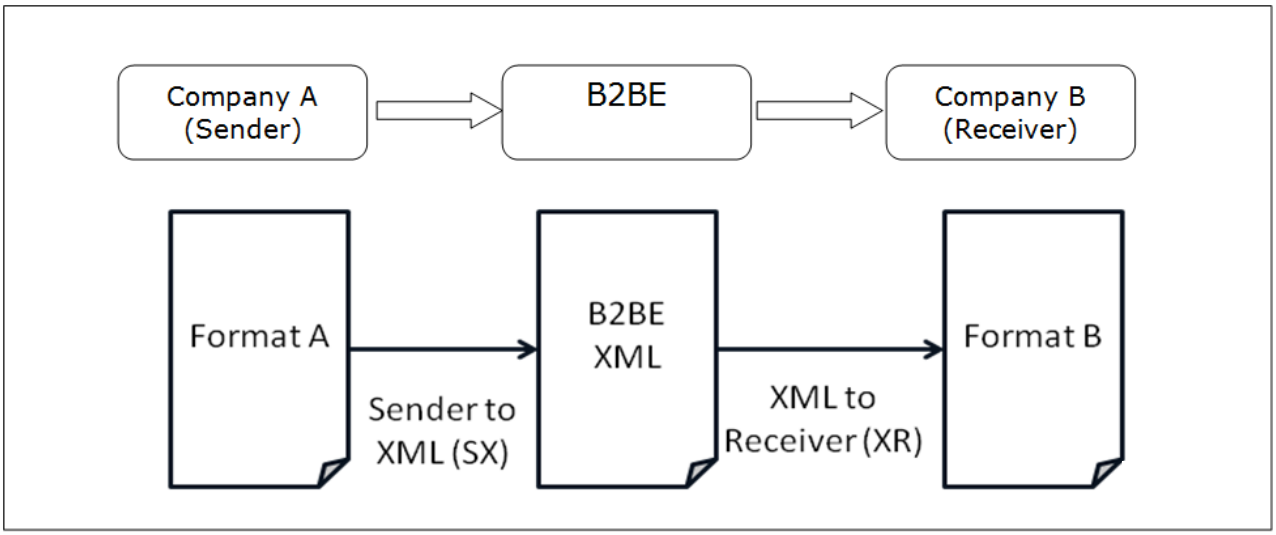

Figure 5.1 TDN which only involved 2 types of translation: SX and XR.

From Figure 5.1, when the Company A sends in their business document in format A:

i. SX translation – translate Format A document into B2BE XML format (our internal document format).
ii. XR translation – translate B2BE XML format to Format B, which is required by the Company B.

If the company A needs to trade with more than one trading partners, each of its trading partners consists specific requirements. In order to fulfill every party's requirements, CUSTOM translation is needed to control all the customization logics and specific requirements for different trading partners.

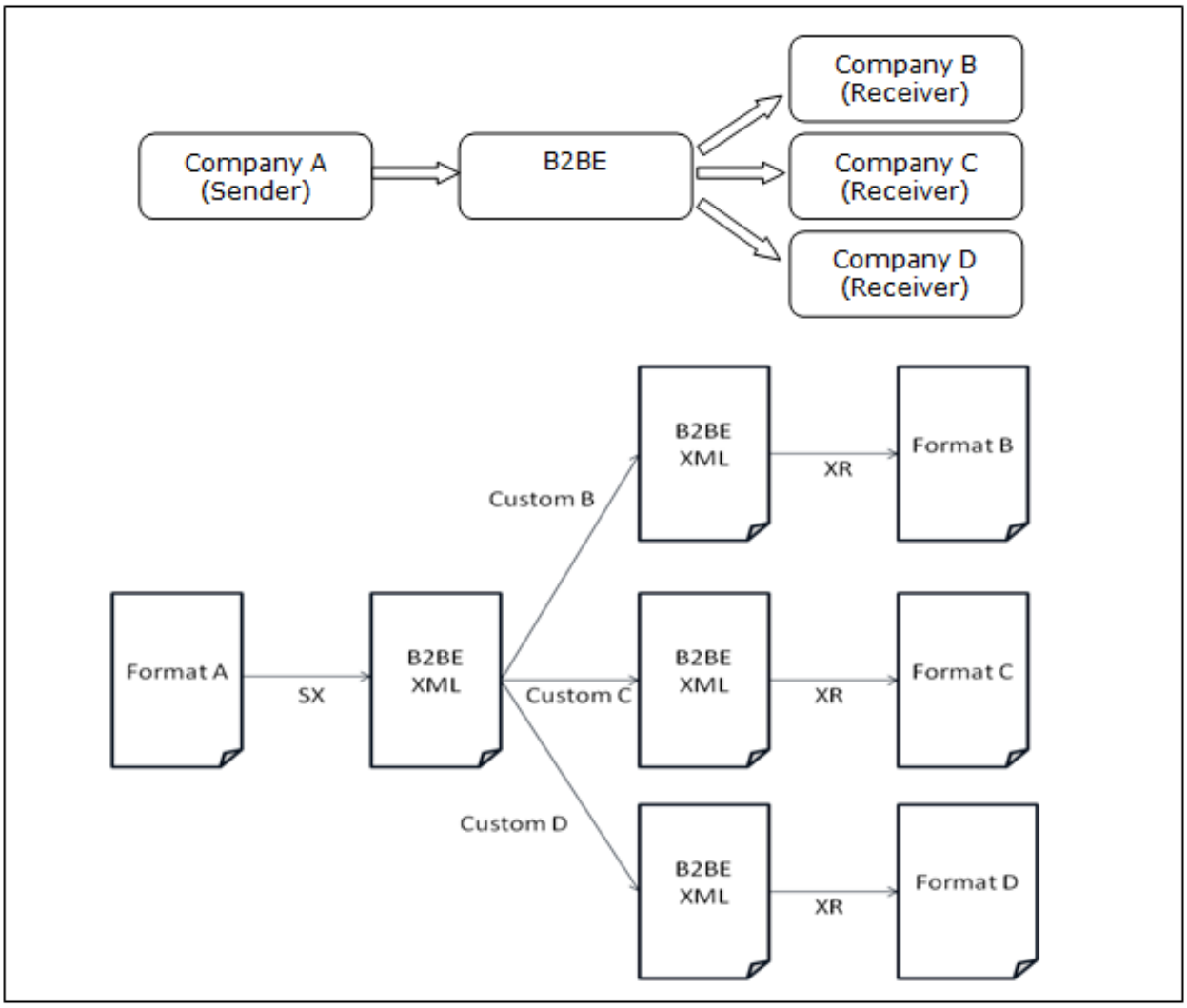

Figure 5.2 TDN which required 3 types of translation: SX, CUSTOM and XR.

From Figure 5.2, when the Company A sends in their business document in format A:

i. SX translation – translate Format A document into B2BE XML format (our internal document format).

ii. CUSTOM translation – control the customisation logic, specific requirements required by the specific receivers, fine tune data and put them back into B2BE XML format.

iii. XR translation – translate B2BE XML format (after CUSTOM) to Format B, which is required by the Company B.

5.1 SX, Custom, XR

Table below shows the further details onto 3 different translation types:

SX	• Sender to B2BE XML translation • Take the sender's file format; translate it into generic B2BE XML format. • Ensure all the senders information is mapped completely and correctly into B2BE XML. • Information must be checked and validated, to ensure everything in file present in B2BEXML. • Simple mapping issues can result in thousands of dollars in incorrect products or values. • Get the detailed file specifications to ensure the mapping done correctly and sufficient. • Do not hardcode sender or receiver in order to perform certain logics for specific receiver. All the customisation logic should move to CUSTOM.
CUSTOM	• Customisation logic • Between only 1 sender and 1 receiver, onto 1 file type. • Lookup information from database, backup file • Business rules applied to document to fulfill what the specific receiver needed.
XR	• B2BE XML to Receiver translation • Processing generic B2BE XML format to the receivers file format. • Ensure B2BE XML mapped correctly to receivers file. • Information must be checked to ensure all the necessary fields needed by receivers are populating. Else the invalid file fails at Receiver's business system. • Detailed file specification tell us how the output file should look like, and also the mandatory fields. • Do not hardcode sender or receiver in order to perform certain logics for specific receiver. This customization logic should be done in CUSTOM.

Table 5.1 Translation key stages

5.2 Translation Setup and Relationship Setup

Once we developed the translations SX, Custom, and XR, we will need to:

i. Setup the correct translation

- Specify between which sender and which receiver, the document type need to be translated, what translations (SX, Custom (if any), and XR) will be used.
- For example: Company A would like to send Purchase Order to Company B

Sender	Company A
Receiver	Company B
Document Type	Purchase Order
Translation Setup	SX: companyA-aupurchaseordertob2bexml CUSTOM: companyAtocompanyB-aupurchaseordercustom XR: companyB-aupurchaseorderfromb2bexml

** You have to setup the correct translations will be used within Company A and Company B, for their Purchase Order.

Table 5.2 Translation Setup

- Note: The translation can only be setup after the translation has been released. Further details may found in B2BE_MYGTASS_TrainingMaterial_Translation Admin.docx
- If the translation didn't setup correctly, the document will not be able translated as requested.
- Further information may found in B2BE_MYGTASS_TrainingMaterial_V2 Admin.docx

ii. Setup the correct relationship

- We will need to setup the correct relationship too between which sender, which receiver onto which document, and also whether there's a need to block duplicate document:

Sender	The Sender, their B2BE User ID.
Receiver	The Receiver, their B2BE User ID.
Document type	Document Type between this Sender and Receiver they will trade.
Block Duplicate	Whether they would like our system to block all the duplicate document (repeated Primary Document ID).
Enabled	The status of this document trade between this sender and receiver, whether it is active (there are documents traded from the sender to receiver), or been terminated (No more documents able to be traded from the sender to receiver).

Table 5.3 Relationship Setup

- Further information may found in B2BE_MYGTASS_TrainingMaterial_V2 Admin.docx

5.3 Tools will be used in Translation Development

We can use several tools listed as below during our development of a translation:

Tools	Description
Project Manager	• Check and retrieve your task and project details and resources needed. • Update task and project status.
	• Further details in: B2BE_MYGTASS_TrainingMaterial_ProjectManager.docx
Notepad++	• Source code editor. • Used to generate our source code in C++ in Translation.cpp, and Translation.h.
	• Further details in: B2BE_MYGTASS_TrainingMaterial_Notepad++.docx
WinSCP	• Our SFTP, FTP client. • To transfer file or source code to our different sever environment. • We will transfer the Translation.cpp and Translation.h to our mel02TEST environment (10.0.1.7) for testing purpose.
	• Further details in: B2BE_MYGTASS_TrainingMaterial_WinSCP.docx
Translation Admin	• Our online compiler in our B2BE Intranet. • Used to debug and compile the Translation.cpp, Translation.h • Source Control onto our source code of Translation. • Documentation, data structure, references, function library which give us help in code generation.
	• Further details in: B2BE_MYGTASS_TrainingMaterial_TranslationAdmin.docx
B2BE Client	• Upload the test files to our V2Admin in mel02TEST environment, to do end-to-end testing. • ***Note**: You are only allowed to upload the test files to mel02TEST environment. Neither mel02UAT (unless with consultant permission) nor mel02 LIVE are allowed!
	• Further details in: B2BE_MYGTASS_TrainingMaterial_B2BEClient.docx

V2 Admin	• Place to keep all the transaction documents record, setup relationships, translation used, customer's account details and etc. • Translation tools – Setup the translations need to be used between sender and receiver, for specific document type. • Relationship tools – Setup the relationship between sender and receiver, onto specific document type, whether need to be blocked duplicate document, and the relationship is whether enabled or disabled. • Account tools – Search the account details of the customer, including username, password, customer centre login path. • Document Search – Search out the relevant documents. Show the results of either success or failure of the file while performing end-to-end testing (UPLOADED->SX->CUSTOM->XR->DELIVERED) after you have released the latest changes code. • Check the output file in different stage without manually run in translation admin.
	• Further details in: B2BE_MYGTASS_TrainingMaterial_V2Admin.docx
phpMyAdmin	• Used for managing the table – creation, modify, delete, update and etc. • Place to store record in tables, for translations to either update, retrieve, delete the data. • ***Note**: You are only allowed to create, update or delete the table in Phoenix Test – DB1 which is in our TEST environment.
	• Further details in: B2BE_MYGTASS_TrainingMaterial_phpMyAdmin.docx
EDI Notepad	• Used to verify the EDIFACT file which is generated by using translations, whether it is in correct format, segment, field count and etc. • Ensure the EDIFACT file delivered to customer would not cause any failure or incomplete data delivered into their system.
	• Further details in: B2BE_MYGTASS_TrainingMaterial_EDINotepad.docx

XML Tool	• Used to verify the XML file which is generated by using translations, whether it is in correct format, with open and close tag and etc. • Ensure the XML file delivered to customer would not cause any incomplete data delivered.

Table 5.4 Tools will be used in translation development

5.4 Importance of Testing and Validating file

It is always important for us to do testing after we create or update one translation. We will always developing, and do testing in our MEL02TEST environment.

End-to-end testing is very important to ensure:

- The final delivered output, is as what receivers needed.
- Pass through their business system successfully.

Tools that we will need to use for testing are:

- B2BE Client - upload and renaming file for comparison later
- V2 server - to process the document from end to end. (UPLOADED->SX->CUSTOM->XR->DELIVERED)
- WinMerge – comparing the TEST results with LIVE, UAT or expected output provided by project coordinator.

Besides, even though the translation has been compiled and run in no errors, it doesn't mean the output can always passed through client's system with no error.

We need to validate the output. For example, the EDIFACT document can be validated by using EDI Notepad; XML document can be validated by using XML Tools stated as in section 5.1.

6.0 Delivery Channels

Same as receiving the files from Senders, we do also have several ways to enable Receivers to retrieve the documents from our site. These delivery channels are our company's products too, for the customers to access or retrieve documents in easier and effective ways:

i. Web Portal
- Customer center to trade the electronic document.
- Enable partners, employees, customers to share information effectively.
- Enable customer to customize the way in which electronic information transacting through B2BE.

ii. E-Catalogue (E-cat)
- Enable customer to receive and check their Purchase Order only from their customer.
- Product catalogue management solution by providing online access to their entire product range globally 24 x 7.

iii. M-Commerce
- Enable customer to receive and check their Purchase Order through PDA Mobile.
- Enable customer to manage data and information mobility.
- Sales force automation, customer relationship management, warehouse and logistics and etc.

iv. Warehouse Management System (WMS)
- For logistic purpose.
- Control the movement and storage of materials within a warehouse, and process the associated transactions.

v. ScanPack

- Online Scan-Packing solution – packing and SSCC label printing requirements.
- Shipping Notes (ASN) using data from Purchase Orders sent electronically through TDN to their customers.
- Calculate carton or pallet packing quantity, based on the ratio of the packing style, against the total quantity ordered.
- Different packing style – inner packing, outer packing, pallet packing, style packing.
- Barcode format is customized too as per customer's requirements.