

Maxim's POS Polling Enterprise Service Bus
Implementation Service
EL-FY16-902

Sales/Master/Pricing Data Exchange
Requirements Definition
Document

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Version: 1.3

Document Control

Document History

Version	Date	Author	Revision Remark
1.0	02/12/2016	Steven Chen	1 st draft
1.1	17/12/2016	Steven Chen	Revised based on Carl, Wing and Polly's comments.
1.2	19/12/2016	Steven Chen	Revised based on Carl's comments.
1.3	20/12/2016	Steven Chen	Revised based on Wing's and Polly's comments.

Document/Design Owner

Name	Title
Steven Chen	System Analyst

Key Comments

Name/Title	Choi Ka Wing	
	#	Comments
Comment	1	For every business date data, the EOD data has the last 15 minutes or more of data compared to total real-time data set. It means real time sales data process cannot process the last 15 minutes data because the POS clients EOD process will clear the POS client's real time data staging table.
Response	1	Noted but this is the existing behavior of polling server. Service bus will initially maintain existing handling logic.
Comment	2	For current polling logic, the EOD process should conduct check sum on below 2 points only: <ul style="list-style-type: none">- Total record count- Sum amount of one target column
Response	2	Revise the detailed integrity check requirements to adjust this clarification.
Comment	3	When EOD DBF data file does not have any records, it treats as an exception and alerts the support team.
Response	3	Revised in relevant session.
Comment	4	External data source (e.g. 'CSV') have POS client to Staging (EOD data) and Staging to POS Client (Master data)
Response	4	Add "CSV files (2 types of csv files) accepted. File format information to be provided by Maxim's IT." on 4.2.3.1 task description. Add "Pricing/Master data will distribute to POS client in CSV format. (2 types of csv file). File format information to be provided by Maxim's IT." On 4.3.4.1 task description.

Name/Title	Polly Kam	
	#	Comments
Comment	1	Missing report template format into the requirement.
Response	1	Added in appendix.
Comment	2	Unify the glossary and terms of the whole document. E.g. Staging DB with Service Bus DB; transaction with commitment control.
Response	2	Revised related terms to avoid misunderstanding.
Comment	3	Refer to the response.
Response	3	<p>ESB-SAL-02-01 removed “double discount”.</p> <p>Replace table name “order extra” to “trans” in the RDD when referring to three main polling tables.</p> <p>Add statement “*Figures appear in the reports shown in this section can be exported.” in Appendix F – Report Templates</p> <p>Appendix E – EDW tables list added back</p> <p>“HIST_TRANS_MODIFIER”, “COUPON_SALES”, “TRANS_MODIFIER’. Update TBC items of ITEMSTOCK to “real time”.</p>

Name/Title	Carl	
	#	Comments
Comment	1	Need to add a new data source of CSV file in polling (POS client to Staging)
Response	1	Applied this requirement but may provide impact to project schedule
Comment	2	There are 2 types of DBF files, Infrasy & Pointsoft
Response	2	Noted and request Maxim’s IT to provide the format of both and confirm their format/content aligned.
Comment	3	Refer to the response

Carl		
Name/Title	#	Comments
Response	3	<p>3.1.3.1 #1 no additional component installations on the POS client</p> <p>3.1.3.1 #4 revised “covert log” to “hist_possystem” according to Wing’s previous email</p> <p>3.1.3.1 #5 Non-ESB enabled systems, e.g. “Cake order”, “Event order”</p> <p>3.1.3.1 #6 complete sales order = data which has valid records in orders, trans and order pay</p> <p>3.1.3.1 #9 Revised upon last meeting according to Wing’s comment</p> <p>3.1.3.2 #1 Revised upon last meeting according to Wing’s comment</p> <p>3.1.3.2 #3 Revised upon last meeting according to Wing’s comment</p> <p>4.1 #Sales Data EOD, EOD data should check against “total record count & total amount of target column” as check sum</p> <p>4.1 #Pricing/Master data, transaction = commitment control</p> <p>4.2.3.1 #Task, Not “each job” the round robin rule applies on the job pool (thread pool)</p> <p>4.2.3.1 #Role POS Support – re-run jobs (from POS client to Staging)</p>
Comment	4	Per Carl’s comment from Email received on 19/12/2016
Response	4	<p>4.2.4.2 #ESB-SAL-02-01, Correct key combination for hist-paysum & his_payfig to be provided by Maxim’s.</p> <p>4.2.4.2 #ESB-SAL-02-01, has agreed with Polly, the check sum of both EOD and real time sales data focuses on total record count and total amount.</p> <p>4.2.5.2 #ESB-SAL-REQ -03-01, agreed and covert log was the previous requirement typo, has already changed to hist_possystem. If there’s other rules, please provide the details</p> <p>4.2.6.2 #ESB-SAL-REQ -04-01 Add back check sum into session 4.2.5.2 to reflect carl’s comment in ESB-SAL-REQ -03-04</p> <p>4.2.6.2 #ESB-SAL-REQ -04-04, this part is revised. Just Carl’s version is not up-to-date.</p> <p>4.3.3.2 #ESB-PRZ-REQ -01-02 Please provide details to complete the EOD tables descriptions in the appendix reflecting which tables are full set and which are delta.</p> <p>4.3.5 #ESB-MST-REQ -02-02 Noted. We will use application’s transaction control to intimate current commitment control in the stored procedures.</p>

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1 Background

1.1 Document Purpose

The purpose of the Requirements Definition Document (RDD) is to describe the detailed business, functional and non-functional requirements for a project and its main aim is to provide business and functional context for the project and its objectives. It will provide the input for high-level design activities and it will serve as the baseline against detailed design documents and the implemented solution.

The Requirements Definition Document will provide a common understanding of all of the requirements for all project stakeholders. It covers detailed business requirements, business process design, flow and business rules (aligned to the Maxim's POS-oriented data processing including Sales, Master and Pricing data) as well as functional requirements, use cases and non-functional requirements.

The Requirements Definition Document is part of the deliverables in the Business Case Development phase of Project Delivery Lifecycle.

1.2 Document Scope

The scope of the Requirements Definition Document (RDD) is to describe the detailed business requirements, processes design/flow, system contexts (outlining key applications used by the business unit/domain and the relationships that exist among them), functional requirements, use cases (describing the functional behavior of the impacted applications) and non-functional requirements (describing the non-functional behavior of the supporting operations). The technical designs and specifications of the impacted applications are not included in this document.

1.3 Document Audience

The audience of this Requirements Definition document (RDD) is business users, project stakeholders, project team, partners and suppliers.

1.4 Terms & Abbreviations

Abbreviation	Description
ESB	Enterprise Service Bus
API	Application Programming Interface
EDW	Enterprise Data Warehouse
EOD	End of Day
POS Client	One Database Owner on the Sales side, provided by the POS machine vendor/manufacture
DB	Database
POS	Point of Sales
Staging DB	The service bus database to stage the polling data

1.5 Reference Materials

Document Names
Maxim's POS Polling ESB Implementation Service Proposal EL-FY16-902-v3.docx
POS Polling User Requirement Confirmation-20161121-Discussion Note.xlsx

2 Executive Summary

The aim of the ESB project is to migrate three data processing flows in Maxim's current enterprise architecture using database provided technologies (linked server & stored procedure) to a new platform using Oracle Enterprise Services Bus technology. In the new ESB polling system (ESB system), three data processing flows will be implemented:

- Sales data real time processing to EDW
- Sales data EOD processing to EDW
- Synchronize master data to POS clients (e.g. Pricing/Master)

The ESB system will use JDBC to connect to the databases of existing POS clients in outlets by pre-configured connection information in order to collect sales data from the existing POS systems and update the pricing/master data back to the existing POS clients. Referring to the polling logic found in the production IT51 server, for any connection error, the ESB system will log down the error and retry data synchronization. After reaching maximum retry count, the ESB system will halt the synchronization for that particular POS client and generate alert to related parties for follow up.

All POS clients' connection settings are configurable and maintainable by Maxim's IT. It makes the adding of new POS client easy and no alteration of programming code is required. The ESB system can invoke several configurable concurrent threads to poll/push the data to/from POS clients concurrently for maximizing system performance.

3 Business Context & Concept

3.1 Business Rationale, Objectives & Considerations

3.1.1 Objectives

#	Objective	Description
1	Bridge the POS clients and EDW to Transfer Real Time Sales Data through Service Bus.	Use Service Bus as an enterprise application layer to take over the responsibilities & functionalities of <u>real time polling</u> from Maxim's POS clients which are currently done by SQL Server linked servers and SQL agent jobs.
2	Bridge the POS Clients and EDW to Transfer EOD Sales Data through Service Bus.	Use Service Bus as an enterprise application layer to take over the responsibilities & functionalities of <u>EOD data polling</u> from Maxim's POS clients which are currently done by SQL Server linked servers and SQL agent jobs.
3	Enable the Pricing/Master Data Distribution to POS Clients through Service Bus.	Use Service Bus as an enterprise application layer to take over the responsibilities & functionalities of <u>Pricing/Master data pushing</u> to Maxim's POS clients which are currently done by SQL Server linked servers and SQL agent jobs.

1 Objectives

3.1.2 Expected Business Benefits

#	Outcome	Performance Indicator	Measure	Baseline	Target Level	Accountability
1	Exception Control	Information of the exception logs & exception report	Flexibility in Exception Handling and Job Control	Existing Exception Handling	Moderate	High
2	POS Client Maintenance	Ease of add or remove, pause or resume a POS client	Ease of Job Control and Manipulation	Existing SQL Agent Job Control	Moderate	High

2 Expected Business Benefits

3.1.3 Considerations

3.1.3.1 Assumptions

#	Assumption	Description	Owner
1	JDBC Connection to POS Clients	Service bus's application layer will maintain JDBC connection to collect data from the DB of POS clients. No additional component installation required on the POS client in this phase.	Carl
2	Sales & Sales EOD Data Pushing to EDW	Service bus will write sales and sales EOD data into corresponding staging tables in EDW. EDW will then trigger conversion process against these data to formalize them into other tables. The staging tables' schema shall be the same as those in POS clients/Service Bus Staging DB because Service bus will minimize the data transformation.	Polly
3	"hist_posssystem" Record Monitoring for EOD process	"hist_posssystem" record used as an acknowledgement of EOD processing.	Carl
4	History Records	Assume the history tables are ready for download in POS client once the related "hist_posssystem" record found.	Carl
5	Exception Handling & Report	Oracle ESB Exception Report shows only the exception for those ESB enabled POS system. For those non-ESB based POS system (cake orders, event orders?), error message should refer to the existing POS Polling process. The application layer handles most of the exception handling according to user requirements. Refer to latter sessions details.	Carl
6	Real Time Sales Data Check Sum Mechanism – MITPOS	Sales data from MITPOS could be considered as completed sales order data which has valid records in orders, trans and order pay.	Carl
7	Void order data – MITPOS	Voided sales order would become another reverse order records with the void flag marked to '1' from POS client to service bus.	Carl

#	Assumption	Description	Owner
8	Direct DB-to-DB EOD process	EOD processing, EOD data will be synchronized to ESB Application DB and then do a direct DB-to-DB copy to EDW staging table. System only ensure the total count and the amount is matched between these two systems. There is NO logic for the copying process.	Wing
9	Pricing/Master Data Update to POS client	Pricing/Master update should be maintained the grouped data together in one transaction/commitment. The grouping information could be found in "poll_schema_info".	Carl
10	Pricing/Master data update to POS clients	Assume the pricing/master data has the primary key; the processing will update/merge the data by the reference key to avoid override.	Carl

3.1.3.2 Constraints

#	Constraint	Description	Owner
1	Real Time Sales Data Check Sum Mechanism - POINTSOFT	As records from POINTSOFT POS client will alter (increase and decrease) when the order is changed by time, hence, the checking on the completeness of a sales order would be limited to: <ul style="list-style-type: none"> a) Records under the key combination (branch code, order no., business date) exist in tables of orders, trans and order pay. This consider as the order completeness b) The data transfer will check sum on total record count and total amount of the target column 	Carl
2	EOD Data Process No Compromise	EOD data is full data set transfer from history tables in POS clients to EDW tables, and service bus process is not able to do a proper check sum. Service bus could only carry out record count check. For summing a specific amount field for comparison is not able to carry out.	Wing

#	Constraint	Description	Owner
3	Real Time Sales Data Polling	Real Time sales data-polling process is required to run within configurable time (Start/End time). When the system time is out of the period, it should skip the job submission. According to Maxim's IT, the job trigger should strictly refer to the start time but actual end time should refer to EOD process, the configured end time is for reference. The polling process initiates DB connection in a timed interval even though there is a possibility that the POS client is offline.	Carl
4	POS Client Pricing/Master Data Update Mechanism	No need to delete record in client POS system. The update strategy is: If record exists in the client local DB, update record according to the key (NOT delete and insert). If record does not exist, just insert NEW records. For DELETE action, system only logical mark delete the record but NOT physically delete the record.	Carl
5	Pricing/Master Data Update in Pricing Server	In current pricing server, it requires the triggering of stored procedures to generate pricing data. To adopt existing logic, service bus will have DB adapter implemented to trigger this process by time interval rather than using DB adapter to monitor the pricing/master data's delta change.	Wing

3.1.3.3 Dependencies

#	Dependency	Description	Owner
-	-	-	-

3.1.3.4 Issues

#	Issue	Description
-	-	-

3.1.3.5 Risks

#	Risk	Likelihood	Owner	Severity	Potential Impact/Mitigation Strategy
-	-	-	-	-	-

3.2 Value Propositions

#	Value Proposition	Type	Area of Benefit
-	-	-	-

4 Business Process

4.1 Business Process Scope

Process Area

Name	Description
Sales Data Real Time Exchange	<p>In Maxim's daily operation, sales data in POS clients will upload to 2 data consumers in real time.</p> <ol style="list-style-type: none">1. Sales operation team – for data backup, auditing and other business process (if Sales server still require the data).2. EDW team – use partial data for data conversion and analysis purpose. <p>Sales data shall be collected from 400+ POS clients which are running upon 3 different POS solution vendors with different database models and interface methods. The service bus between the data providers (POS clients) and the data consumers is expected not only to fulfil the purpose of data polling and pushing but also to bridge these differences.</p>
Sales Data End-of-Day Processing	<p>POS client shall conduct end-of-day process before the cut of time (next day 4:00am) in each opening day. The end-of-day process shares the similar mechanism of real time process but requires service bus to monitor the client's EOD flag (indicating that client has finished local data processing) is ready for polling.</p> <p>In the EOD processing, the service bus shall check the total record count and total amount of the target column to ensure the check sum for the POS client's EOD processing to staging without changing.</p>
Master/Pricing Data Processing	<p>Master data and Pricing data shall be generated together in backend, and distributed to POS clients with time interval batch jobs. These data has dependencies between some business related entities and requires their commitment control to be done within one single transaction/commitment control against one POS client.</p>

Process Group

Name	Description	Business Owner	Business Area / Domain
Sales Data Download to Staging DB	POS and EDW sales data Download to Service Bus Staging DB. (Real Time & EOD)	Carl	POS
Send POS Sales Data from Staging DB to EDW	Service Bus send sales data from staging to EDW. (Real Time & EOD)	Polly	EDW
Pricing/Master Data Processing & Download	POS and Pricing Server data exchange by polling schema definition.	Wing	Infra
Pricing/Master Data Distribution	Service Bus application distribute/send pricing/master date from Staging DB to all POS clients.	Carl	POS

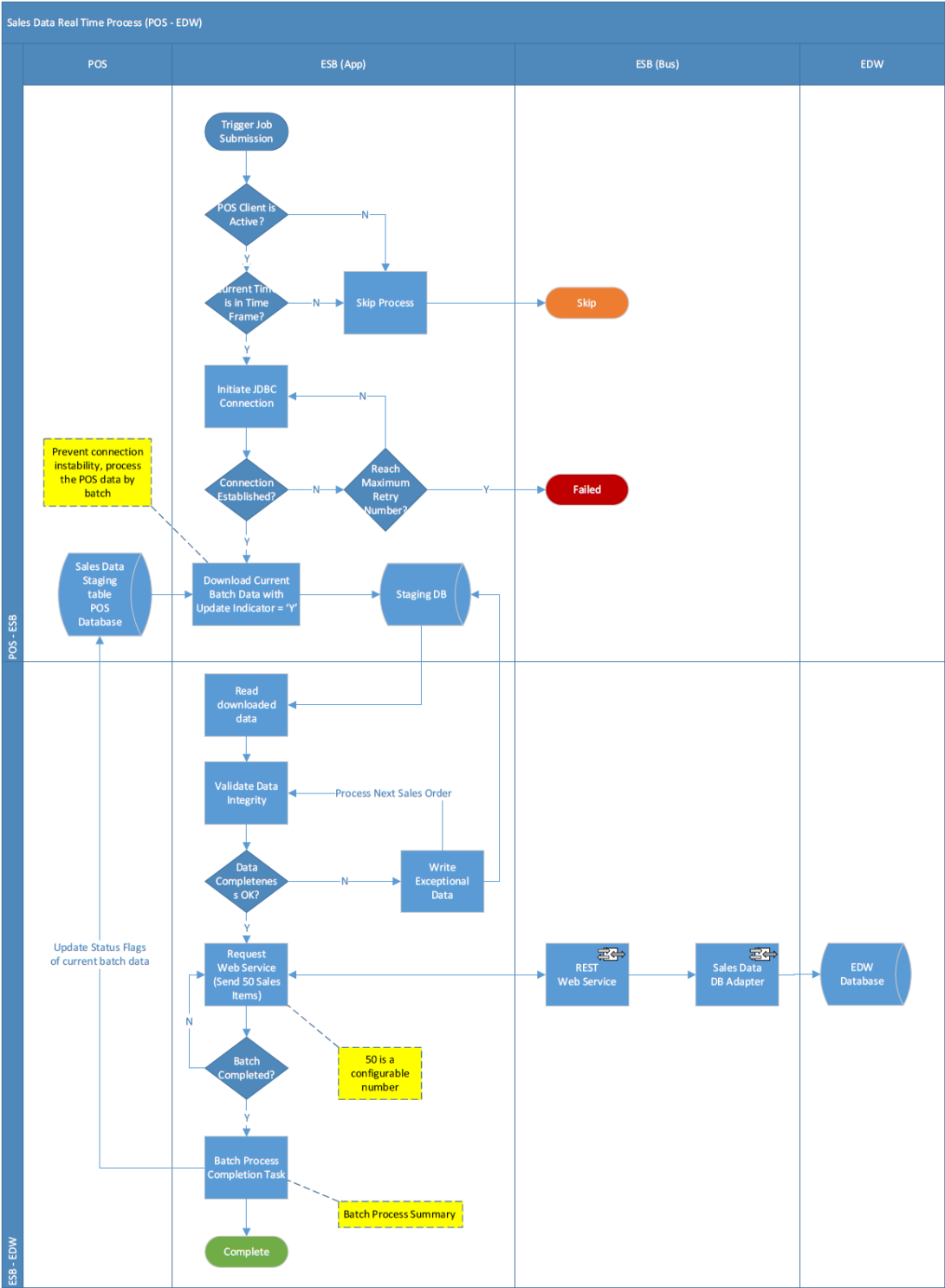
Business Process

Name	Description	Objective
Sales Data Real Time Exchange	In 7x24 time frame, collecting the data from POS clients and put them into EDW.	To fulfil the purpose that the sales data in POS clients must be synchronized to Maxim's Headquarters' EDW in real time.
Sales Data End-of-day Process	For each POS client, execute once (at most) per day to copy data from POS client to EDW.	To transfer EOD data from each POS clients to EDW tables by on-demand trigger.
Master/pricing Data Generation and Update to POS client	Whenever there are updates on master/pricing data, push the updated data to corresponding POS client.	To copy data from pricing/master data DB and distribute them to POS client according to the pricing group setting.

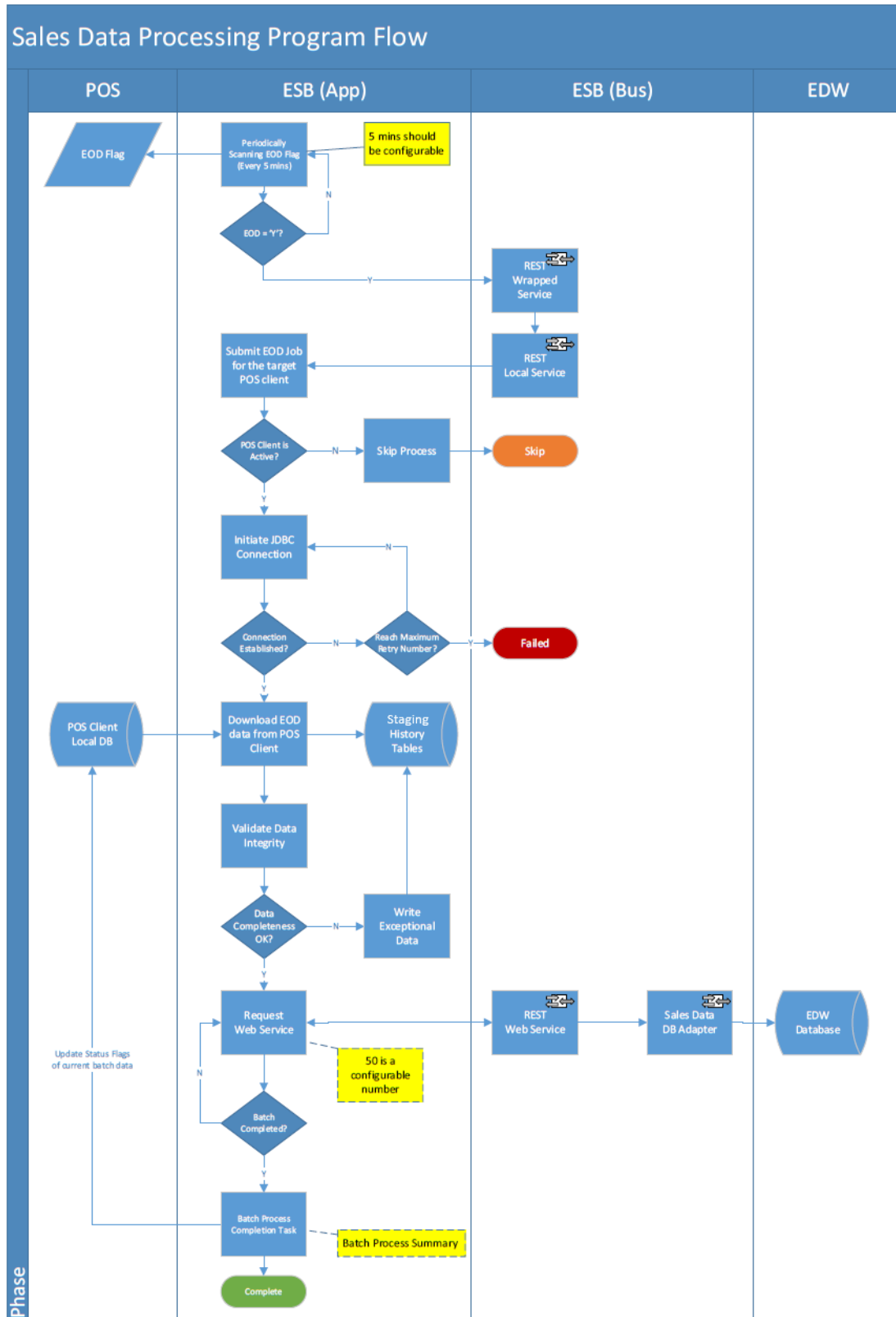
4.2 Sales Data

4.2.1 Sales Data Overall Process Flow

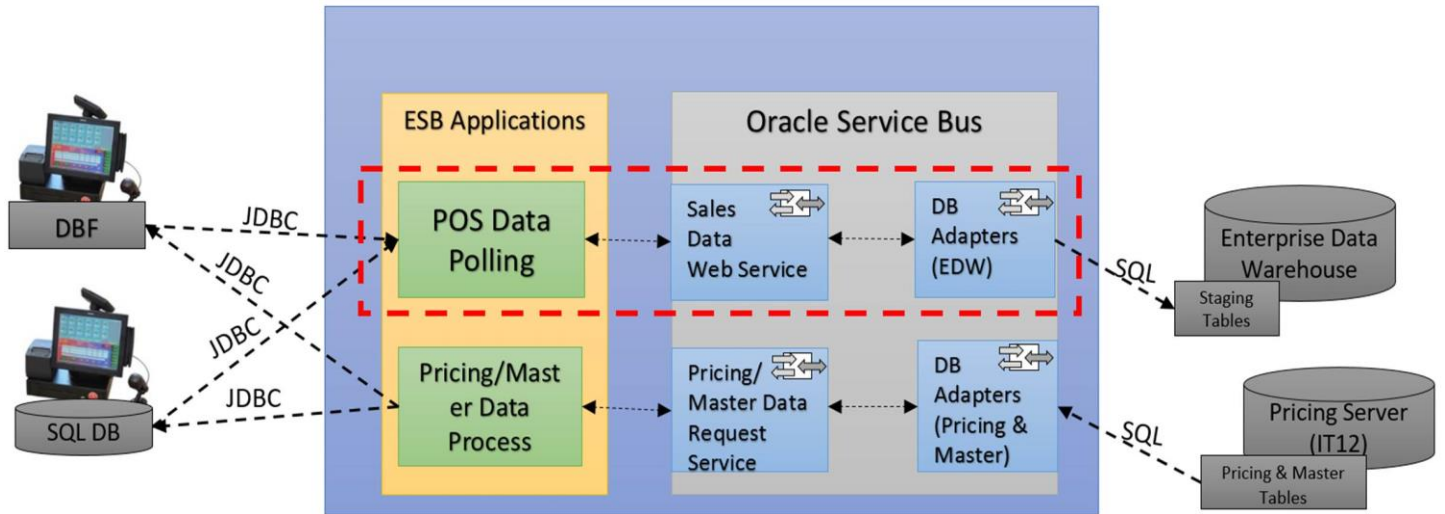
Sales Data Real Time Processing



Sales Data End-of-day Processing

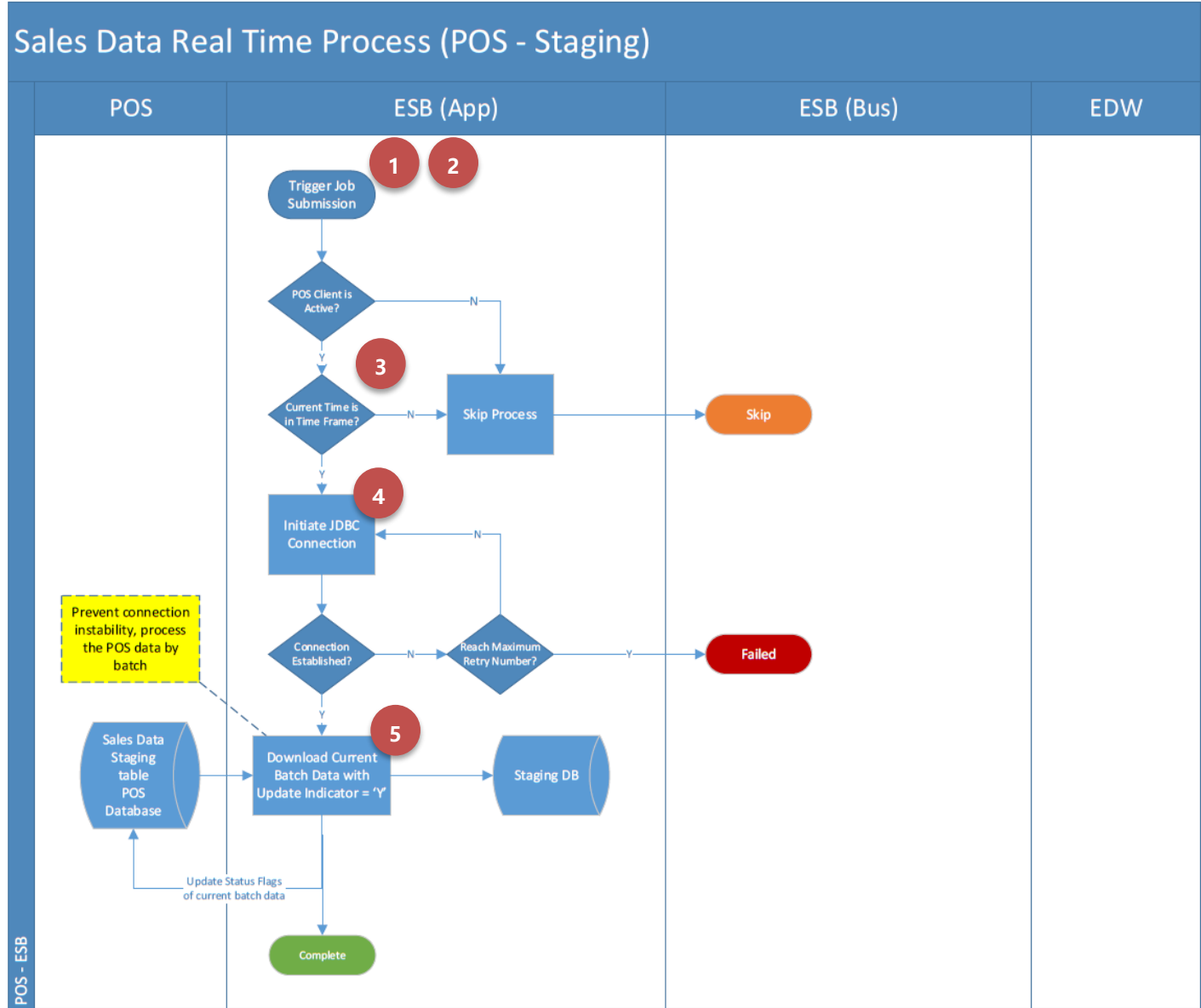


4.2.2 System context



4.2.3 Sales Data Real Time Polling (POS – Staging)

4.2.3.1 Process Flow



Task

Activity	Description	Type	Process Group - Owner
ESB Triggers the Batch Processing Against POS Clients	<ol style="list-style-type: none"> 1. The POS polling job pool is controlled by a centralized job controller which runs periodically 2. The job controller job will submit multiple jobs in the pool and the set of jobs sequentially process the POS client's sales data polling in round robin rules according to the list of POS client defined (similar to the "poll_scheme_control" table and the branch data in IT50.maxim.dbo.branch) 3. The job controller shall justify the job submission according to the setting from the schema control table <p>Please mentioned parallel processing of Sales/EOD, Pricing and Master for POS client synchronization.</p>	Process	Sales Data Download to Staging DB - Carl
Download Sales Data from POS Clients to Service Bus Working Database	<ol style="list-style-type: none"> 1. For MS SQL basis POS client, e.g. MITPOS, The POS client polling job will initiate the JDBC connection to the target data source, and download polling data set which is "pending" for polling in POS client's DB. 2. If the data source is a DBF file, the job will scan the target directory configured in the "poll_schema_info" table, and use the DBF data to override the data in the staging tables. 3. CSV files (2 types of csv files) accepted. File format information to be provided by Maxim's IT. <p>Note: Assumed that POINTSOFT POS client should use FTP transfer the DBF file to target network directory (FTP server).</p>	Input	Sales Data Download to Staging DB - Carl

Role

Role	Description	Type
System Administrator	The user role has the right to access the admin function of the system, e.g. job control table configuration, data source schema control configuration, parameter configuration, etc.	Admin
System Operator	The user role has the right to conduct job re-run, job logs and dashboard; demand of daily summary report.	Operator

Role	Description	Type
POS Support	The user role has the right to re-run jobs and query the job logs (from POS client to Staging) the responsibility to receive POS related alert email.	Support

Application

Application	Description
Polling Gateway	The application module responsible of downloading data from POS client.
Sending Gateway	The application module to carry out data pushing to service bus interfaces.
ESB Interfaces	The interface for data pushing from the Staging DB of service bus application layer to EDW.

4.2.3.2 Functional Requirement Details

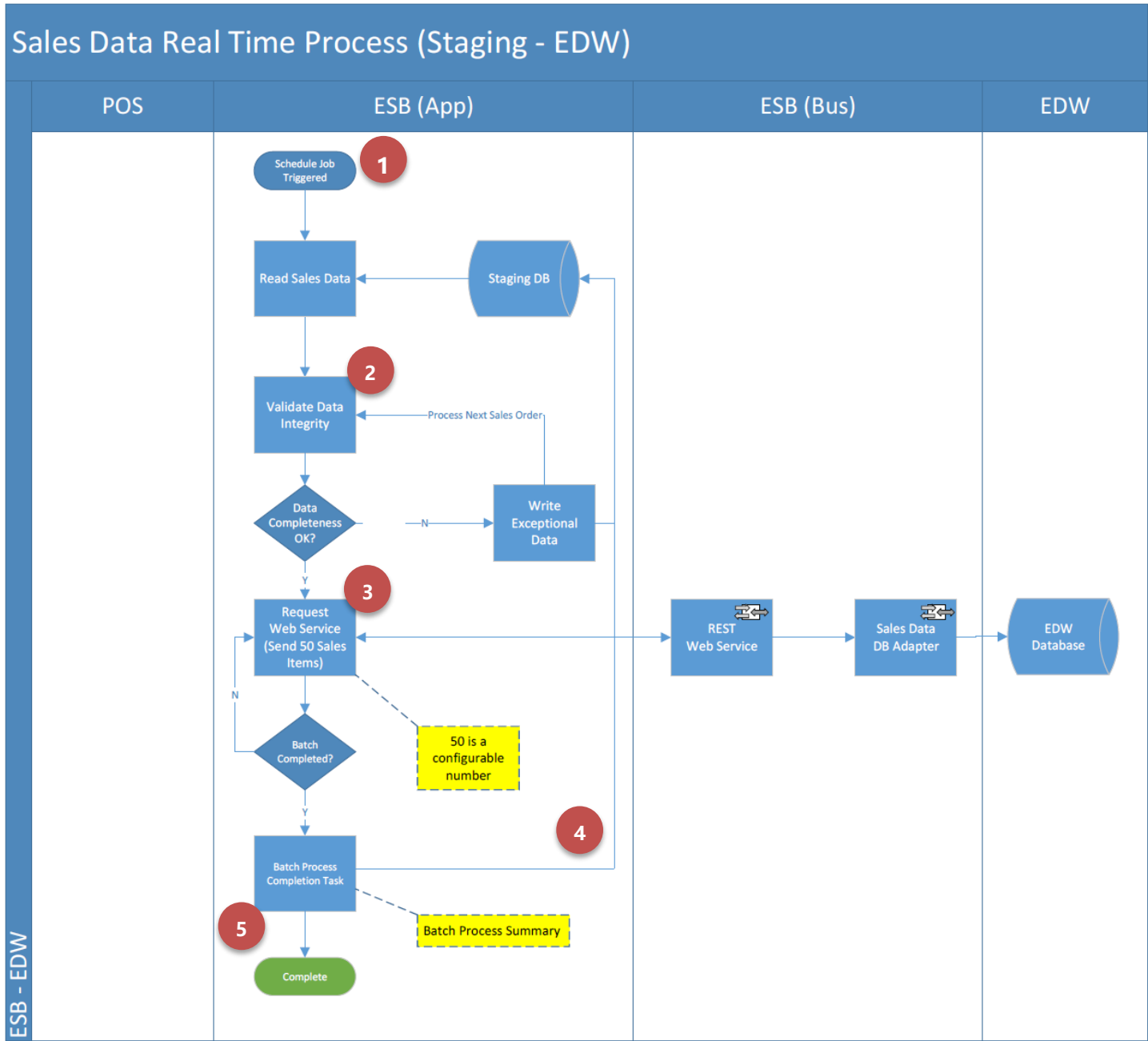
ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-001	Sales Data Real Time polling to Staging DB	Collect the sales data in POS clients to Service Bus Staging DB in real time.	Must Have	Carl	-	---
ESB-SAL-001-01	Data staging to service bus working DB	In real time, the service bus shall trigger schedule jobs to download data from POS clients' database.	Must Have	Carl	<p>The schedule runs in a time interval no longer than 15mins. (current SQL Agent schedule job time)</p> <p>The running period of the schedule shall be 7x24 polling.</p>	ESB-SAL-001
ESB-SAL-01-02	Data staging to service bus working DB	The schedule job shall handle 2 kinds of data source connection according to different POS machine vendors.	Must Have	Carl	<p>1. POINTSOFT – DBF file The DBF file contains the full set of data of target tables from POS client's DB.</p> <p>2. MITPOS – SQL Server database connection For the database connection, the schedule job shall download the delta data indicated by the flags in local tables of POS clients.</p>	ESB-SAL-001

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-01-03	Data staging to service bus working DB	<p>The service bus polling application will take care of the sales order transactions according to different POS client.</p> <ul style="list-style-type: none"> - MITPOS 	Must Have	Carl	MITPOS client will commit a “full sales order transaction” as a whole, which means ORDER, TRANS and PAY are committed together when a purchase order is completed. When there is void order, MITPOS client will generate voided transaction for the corresponding records.	ESB-SAL-001
ESB-SAL-01-04	Data staging to service bus working DB	<p>The service bus polling application will take care of the sales order transactions according to different POS client.</p> <ul style="list-style-type: none"> - POINTSOFT 	Must Have	Carl	<p>POINTSOFT POS will commit by tables instead of "Sales", partial record found.</p> <p>For Sales Polling, only "whole" sales transactions sent to EDW for Sales data Polling. Partial sales records (e.g. POINTSOFT POS) should NOT send to EDW. The data from POINTSOFT client will stage in service bus working DB until the data become consistent.</p>	ESB-SAL-001
ESB-SAL-01-05	Update POS Client's Polling Flag after	Update POS Client's Polling Flag after the download of data is successful.	Must Have	Carl	After downloading the sales data from POS client, if transfer success, the processing job updates the polling flag status back to POS client indicating the batch of data has already polled to service bus Staging DB upon the job completion.	ESB-SAL-001

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-01-06	Job Completion	The job completion shall log information of the job processing in DB for real time processing.	Must Have	Carl	<ul style="list-style-type: none"> a) Job run status b) Number of records processed c) Job name, e.g. POS – Staging d) Job ID e) Job run error stage (if any) f) Error Category, e.g. DB, Network and Other, etc. g) Job start/end time (regarded as Coping to Staging start/end time) 	ESB-SAL-001

4.2.4 Sales Data Real Time Polling Flow (Staging - EDW)

4.2.4.1 Processing Flow



Task

Activity	Description	Type	Process Group - Owner
Read Sales Data from Staging DB	The real time sales data processing job (Staging to EDW) submitted to process the real time sales data in the Staging DB of target POS client.	Process	Send POS sales data from Staging DB to EDW – Polly
Validate Data Integrity	The job will continue to validate (refer to requirement details of Sales Data real time processing in below section 4.2.4.2 #ESB-SAL-02-03) the polled sales data's integrity by order in the staging table of current batch. If the whole batch data's completeness guaranteed, the job will move to next steps.	Process	Send POS sales data from Staging DB to EDW – Polly
Send Sales Data to EDW	<p>The job will send the data to EDW through the pre-configured interface in the service bus, and the interface shall fulfill below function.</p> <ul style="list-style-type: none"> a) Transfer sales data apple-to-apple from Staging DB to EDW b) Response a return code indicating the data transfer is success or not. The response will contain the records ID with corresponding return code. <p>If the transfer is successful, the response result will update into staging database, and lately reverted to Staging DB upon the job's completion.</p>	Output	Send POS sales data from Staging DB to EDW - Polly
Job Completion	<p>Update the job log to reflect the summary of the whole real time batch including:</p> <ul style="list-style-type: none"> a) Job run status b) Number of records processed c) Job name, e.g. Staging – EDW. d) Job ID e) Job run error stage (if any) f) Error Category, e.g. DB, Network and Other, etc. g) Job start/end time (regarded as Staging to EDW start/end time) 	Process	<p>Sales Data Download to Staging DB – Carl</p> <p>Send POS sales data from Staging DB to EDW - Polly</p>

Measure

Measure	Description
-	-

Role

Role	Description	Type
System Administrator	The user role has the right to access the admin function of the system, e.g. job control table configuration, data source schema control configuration, parameter configuration, etc.	Admin
System Operator	The user role has the right to conduct job re-run, job logs and dashboard; demand of daily summary report.	Operator
Service Bus Operator	The user role has the right to conduct job re-run, job logs the responsibility to receive EDW related alert email.	Support

Application

Application	Description
Polling Gateway	The application module responsible of downloading data from POS client.
Sending Gateway	The application module to carry out data pushing to service bus interfaces.
ESB Interfaces	The interface for data pushing from the Staging DB of service bus application layer to EDW.

4.2.4.2 Functional Requirement Details

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-02	Data Processing to EDW	-	-	-	-	-
ESB-SAL-02-01	Data Processing to EDW	The real time sales data processing job (Staging to EDW) reads sales data from Staging DB. Firstly, it shall check the Data integrity for data from both MIDPOS and POINTSOFT.	Must Have	Polly	<p>According to #ESB-SAL-01-03 & # ESB-SAL-01-04</p> <p>a) "orders", "trans", "order_pay", "coupon". Including tables list, where tables are mandatory or not.</p> <p>b) Tables are linked by:</p> <ul style="list-style-type: none"> - Business Date - Branch Code - Order No. <p>c) All sales tables linked up by the above keys.</p>	ESB-SAL-02

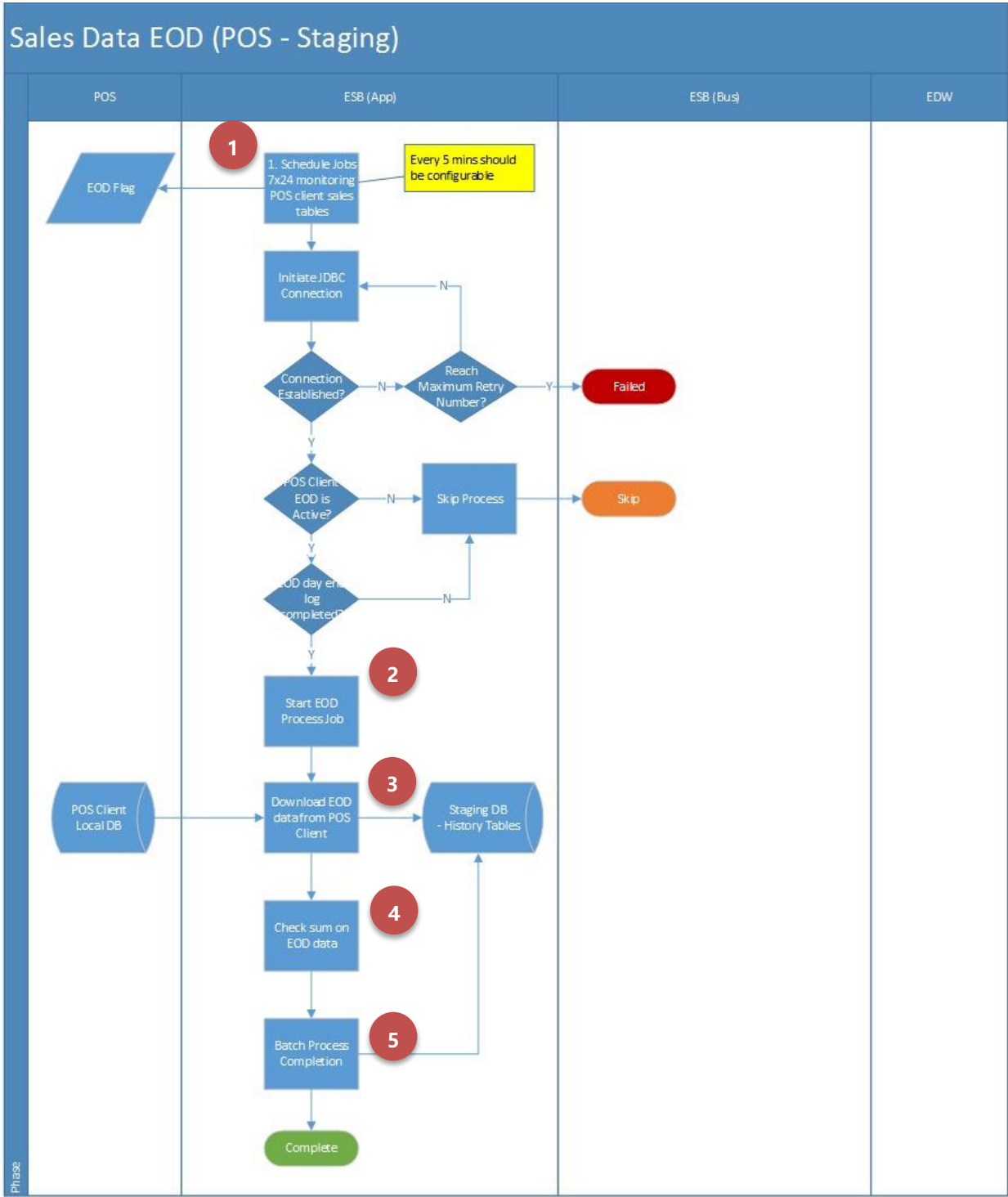
ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-02-02	Data Processing to EDW	Data processing job will focus on real time sales data related target table.	Must Have	Polly	<ul style="list-style-type: none"> - Check_log (check_logs) - Coupon sales (coupon_sales) - Orders (orders) - Orders pay (orders_pay) - Redeem coupon (redeem_coupon) - Supp (supp) - Trans (trans) - Transaction ecard (trans_ecard) - Transaction modifier (trans_modifier) 	
ESB-SAL-02-03	Data Processing to EDW	After verifying whether the sales data is completed. Send the completed data to EDW.	Must Have	Polly	The service bus application will use “business date, branch code, order no.” to check the integrity of data. When the data in tables of “orders”, “trans” and “order pay” (but not limit to) confirmed completed, the service bus application will send the full order data to EDW.	ESB-SAL-02

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-02-04	Data Processing to EDW	Real Time sales data polling exceptional data handling.	Must Have	Polly	<p>Theoretically, the data from POS client shall not contain the in-consistent data to service bus. Because the data updating logic of POINTSOFT is full table override, the service bus application will wait until the data of a sales order to complete, and send to EDW.</p> <p>There will be an indicator in the staging database reflecting the records sent or not. Until the polling cut-off time (4:00am, configurable), the system shall send the alert email with accumulated exceptional data to support team.</p>	ESB-SAL-02
ESB-SAL-02-05	Data Processing to EDW	<p>Sales data sending, by block update and return code. With the return code of the service call, the process will mark the block of records the completion of the sending to EDW.</p> <p>When return value is a failure code, the process applies a retry mechanism with the retry limit. If the number of retry exceeds the limit, it shall skip to next block, and the job will end with error data log.</p>	Must Have	Polly	The service bus has the limitation of network; the number of records shall be transferred block by block (e.g. 50) into EDW through the service. This number shall be a configurable item in the system. When the service response success return code, update to the staging tables indicating the corresponding records synchronized.	ESB-SAL-02

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-02-06	Job Completion	The job completion shall log information of the job processing in DB for real time processing.	Must Have	Polly	a) Job run status b) Number of records processed c) Job name, e.g. Staging - EDW d) Job ID e) Job run error stage (if any) f) Error Category, e.g. DB, Network and Other, etc. g) Job start/end time (regarded as Coping to EDW start/end time)	ESB-SAL-002

4.2.5 Sales Data End-of-day (POS – Staging)

4.2.5.1 Process Flow



Task

Activity	Description	Type	Process Group/Owner
Monitor POS Client's Completion of its EOD Process.	<p>The enterprise service bus processes shall monitor the update of the "hist_possystem" which was written in POS clients.</p> <p>On retrieved the triggering value of this record, the EOD job controller will fire a job to start the EOD process towards this data source (MITPOS).</p>	Process	Sales Data Download to Staging DB - Carl
Download EOD sales data from POS clients to service bus Working Database	The EOD processing job downloads full set of data from POS client's history tables, and stage them in service bus DB.	Input	Sales Data Download to Staging DB - Carl
Validate Data Integrity	<p>After successfully written into Staging DB, the processing job will conduct a check sum upon the data set with below criteria:</p> <ul style="list-style-type: none"> a) Number of record count received b) Total Amount check sum c) Creation Date Time of Sales records (HIST_ORDER) is before or after last day's cut-off time, and adjust it business date according to the cut-off logic (refer to requirement details for more info) 	Process	Sales Data Download to Staging DB - Carl

Activity	Description	Type	Process Group/Owner
Job Completion	<p>Update the job log to reflect the summary of the whole EOD process including:</p> <ul style="list-style-type: none"> a. Job run status b. Number of records processed c. Job name, e.g. POS - Staging d. Job ID e. Job run error stage (if any) f. Error Category, e.g. DB, Network and Other, etc. g. Job start/end time (regarded as Coping to EDW start/end time) 	Process	Sales Data Download to Staging DB - Carl

Role

Role	Description	Type
System Administrator	The user role has the right to access the admin function of the system, e.g. job control table configuration, data source schema control configuration, parameter configuration, etc.	Admin
System Operator	The user role has the right to conduct job re-run, job logs and dashboard; demands the receipt of daily summary report.	Operator
POS Support	The user role has the right to conduct job re-run, job logs the responsibility to receive POS related alert email.	Support

Application

Application	Description
Polling Gateway	The application module responsible of downloading data from POS client.
Sending Gateway	The application module to carry out data pushing to service bus interfaces.
ESB Interfaces	The interface for data pushing from service bus's application layer Staging DB to EDW.

4.2.5.2 Functional Requirement Details

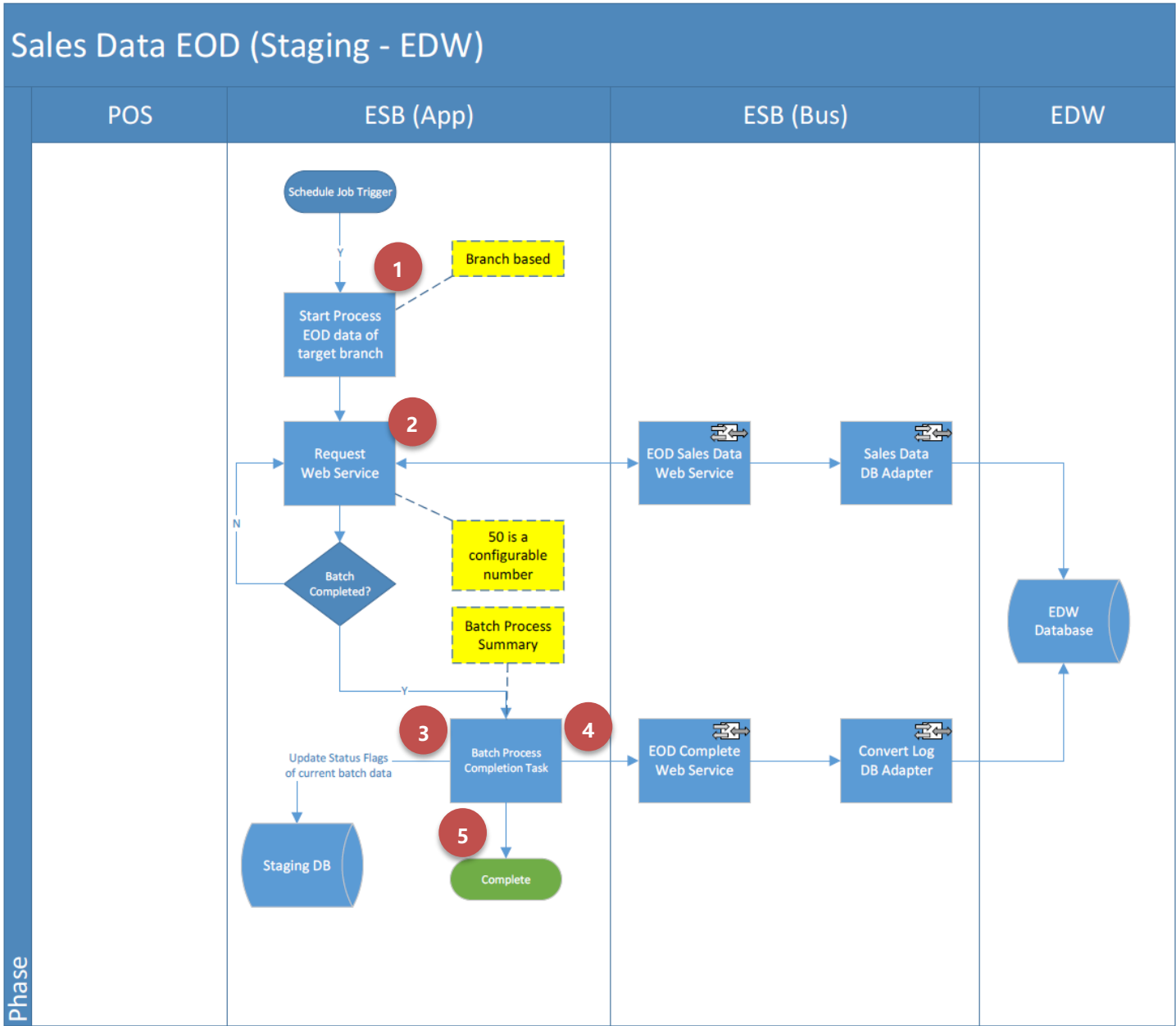
ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-REQ-03	End of Day Data Processing	-	-	-	-	-
ESB-SAL-REQ -03-01	POS Client Triggering	After the POS client completes its EOD processing, it insert a new record into "hist_possystem" table indicating it's ready for the EOD polling.	Must Have	Carl	<p>The hist_possystem log indicates the EOD process's completion on POS client side and ready for polling server's action.</p> <p>Service Bus application shall take it as a reference signal as the EOD processing start.</p>	ESB-SAL-REQ-03
ESB-SAL-REQ -03-02	POS Client EOD Monitoring	The service bus shall run an application monitoring the local end-of-day indicator in the POS database.	Must Have	Carl	Because current POS clients do not have the capability of web service call, the service bus is not able to trigger the EOD process passively. Therefore, it requires the service bus application will be able to running a job keep monitoring the local EOD flag. When discovering the flag has changed to the EOD value, submit a job to start the EOD process for that POS client.	ESB-SAL-REQ-03

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-REQ -03-03	POS Client EOD Data Process	The service bus initiate a JDBC connection to download all EOD history tables from POS client to its Staging DB.	Must Have	Carl	To avoid holding the DB connection too long, or interruption of processing if confronted network issue, the EOD process also downloads the full set of history data into Staging DB first.	ESB-SAL-REQ-03
ESB-SAL-REQ -03-04	POS Client EOD Data Process	Update data synchronization status in Staging database and POS client.	Must Have	Carl	<p>After the history data successfully downloaded to Staging, synchronization result is no need to update back to POS client but logical check sum is required as below</p> <ul style="list-style-type: none"> a) Number of record count received b) Total Amount check sum c) Creation Date Time of Sales records (HIST_ORDER) is before or after last day's cut-off time, and adjust it business date according to the cut-off logic (refer to requirement details for more info) 	ESB-SAL-REQ-03

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-REQ -03-05	EOD Process Job Summary	The end of the job also log down the demanded information for user to collect details of data of the job running progress & result.	Must Have	Carl	<p>Update the job log to reflect the summary of the whole EOD process including:</p> <ul style="list-style-type: none"> a. Job run status b. Number of records processed c. Job name, e.g. POS - Staging d. Job ID e. Job run error stage (if any) f. Error Category, e.g. DB, Network and Other, etc. d) Job start/end time (regarded as Coping to EDW start/end time) 	ESB-SAL-REQ-03

4.2.6 Sales Data End-of-day (Staging – EDW)

4.2.6.1 Process Flow



Task

Activity	Description	Type	Process Group/Owner
Monitor POS Client's Completion of its EOD Process.	Upon the completion of downloading EOD data of the target branch into staging, the EOD sales data process (Staging to EDW) triggered to read those data (same branch) from Staging DB.	Process	Send POS sales data from Staging DB to EDW - Polly
Send the Sales Data to EDW	Send the EOD data to EDW with block-by-block transaction commitment through the Service Bus.	Output	Send POS sales data from Staging DB to EDW - Polly
Revert the Sending Results Back to POS client	If the transfer is successful, the response result updated into staging database, and lately reverted to staging database upon service call response.	Output	Send POS sales data from Staging DB to EDW - Polly
Validation on Sent Data	Upon the finish of the process, triggers a service to validate the total count & total amount of the transferred data on EDW side. If correct then call another service to write a convert log to EDW indicating the EOD process for that branch completed.	Output	Send POS sales data from Staging DB to EDW - Polly
Job Completion	Update the job log to reflect the summary of the whole EOD process including <ul style="list-style-type: none"> a) Job run status b) Number of records processed c) Job name, e.g. EOD – Staging – EDW d) Job ID e) Job run error stage (if any) f) Error Category, e.g. DB, Network and Other, etc. g) Job start/end time (regarded as Coping to EDW start/end time) 	Process	Send POS sales data from Staging DB to EDW - Polly

Role

Role	Description	Type
System Administrator	The user role has the right to access the admin function of the system, e.g. job control table configuration, data source schema control configuration, parameter configuration, etc.	Admin
System Operator	The user role has the right to conduct job re-run, job logs and dashboard; demand of daily summary report.	Operator
Service Bus Operator	The user role has the right to conduct job re-run, job logs the responsibility to receive EDW related alert email.	Support

Application

Application	Description
Polling Gateway	The application module responsible of downloading data from POS client.
Sending Gateway	The application module to carry out data pushing to service bus interfaces.
ESB Interfaces	The interface for data pushing from service bus application layer Staging DB to EDW.

4.2.6.2 Functional Requirement Details

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-REQ-04	End of day Data Processing	-	-	-	-	-
ESB-SAL-REQ -04-01	POS Client EOD Data Process	The EOD data will directly transfer the full data set to EDW.	Must Have	Polly	<p>EOD data synchronized under a direct DB-to-DB copy to EDW staging table. System only ensure the total count and the amount is matched between these two systems. There is NO logic for the copying process.</p> <p>Since the EOD data does not have clear criteria of check sum and consistency, service bus will assumed the data is fully committed by POS client. Data will then copied to EDW directly without integrity checking.</p>	ESB-SAL-REQ-04

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-REQ -04-02	POS Client EOD Data Process	<p>Service bus EOD process will also need to distinct the data's business date when copying the data from POS client to staging database.</p> <p>Because sometimes the POS client will accumulate multiple day's data in one EOD process, the service bus EOD job shall identify this kind of data belonging to different business date. Hence, the process shall justify the raw data's creation date against the cut-off time (4a.m.).</p>	Must Have	Polly	<p>a) When record transaction date < last cut-off time, then business date = transaction data - 1</p> <p>b) When record transaction date > last cut-off time, then business date = transaction date</p> <p>For example, EOD records in HIST_ORDER Business Date, transaction date 25-Nov-2016, 25-Nov-2016 09:12 → No change 25-Nov-2016, 25-Nov-2016 04:11 → No change ----- Cut off Time (04:00) ----- Case 1: 25-Nov-2016, 25-Nov-2016 02:12 → Business date changes to 24-Nov-2016 Case 2: 25-Nov-2016, 25-Nov-2016 06:33 → Business date changes to 25-Nov-2016 Case 3: 25-Nov-2016, 24-Nov-2016 03:33 → Business date changes to 23-Nov-2016</p>	ESB-SAL-REQ-04

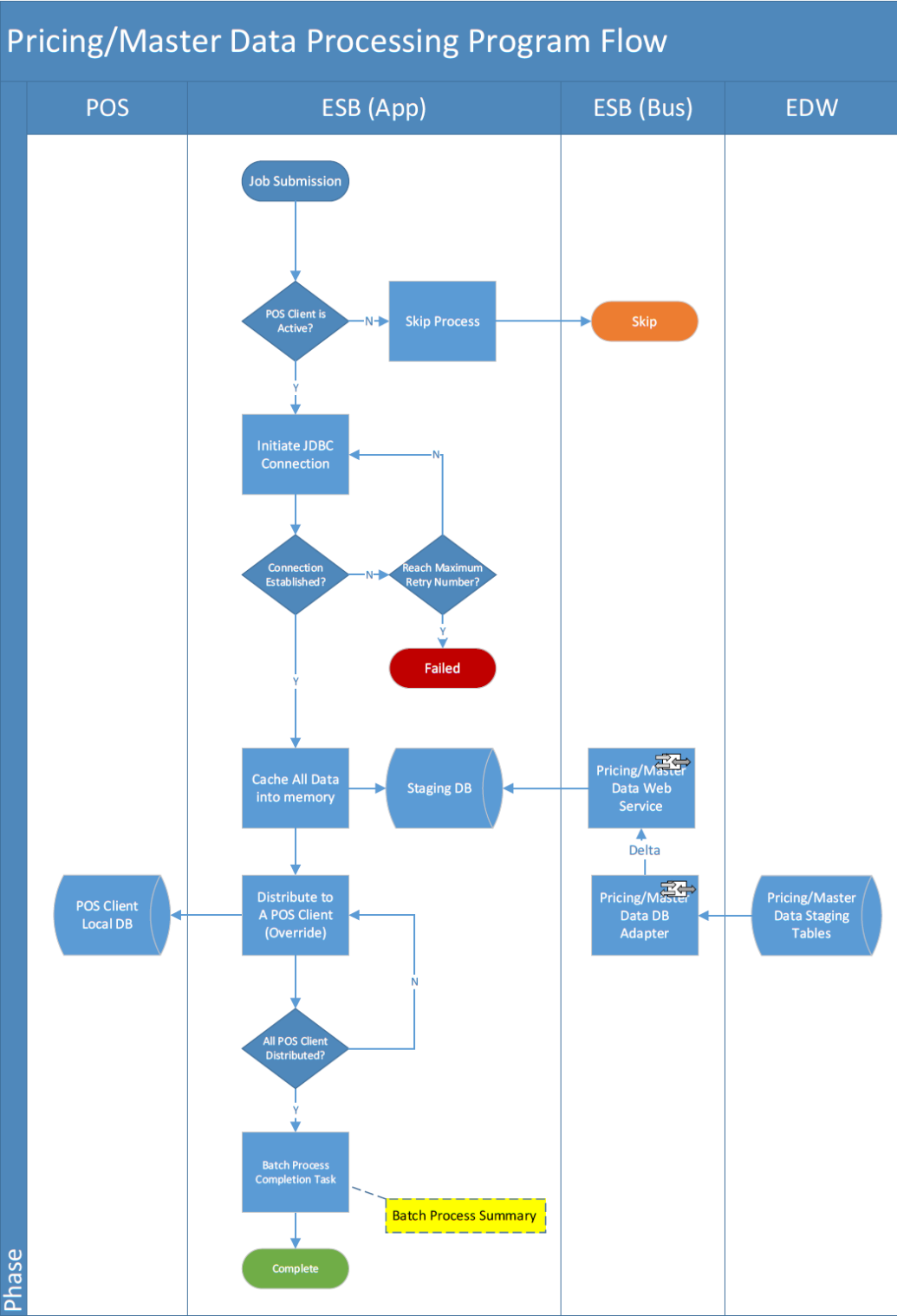
ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-REQ -04-03	POS Client EOD Data Process	The service bus EOD processing job will validate the data with basic check sum logic upon total record count and total amount of target column	Must Have	Polly	Check sum - Total record count - Total amount of target column <i>Note: refer to udsp check upload data</i>	ESB-SAL-REQ-04
ESB-SAL-REQ -04-04	POS Client EOD Data Process	EOD data process exception handling shall accumulate the exception data in a table and pending for operation team's manual involvement.	Must Have	Polly	When the EOD process encounter unexpected exception, the process will skip these data, putting them into exceptional data table and wait for manual retry. Possible exception will be as below: a) EDW database connection lost (this can be retried with retry limit) b) Data cannot be inserted into EDW tables (regarded as service call failure) c) Timeout error, the insert process into EDW makes the application wait exceeds a time limit (60s), this can be retried with retry limit d) When file-based interface (DBF, CSV) contain zero record.	ESB-SAL-REQ-04

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-SAL-REQ -04-05	POS Client EOD Data Process	Update data synchronization status in Staging database and POS client	Must Have	Polly	After the EOD data successfully sent to EDW, the sending result shall revert to service bus application's staging database, and correspondingly update the POS clients.	ESB-SAL-REQ-04
ESB-SAL-REQ -04-06	EOD Process Job Summary	The end of the job also log down the demanded information for user to collect details of data of the job running progress & result	Must Have	Polly	<p>Update the job log to reflect the summary of the whole EOD process including:</p> <ul style="list-style-type: none"> Job run status Number of records processed Job name, e.g. EOD – Staging – EDW Job ID Job run error stage (if any) Error Category, e.g. DB, Network and Other, etc. e) Job start/end time (regarded as Coping to EDW start/end time) 	ESB-SAL-REQ-04

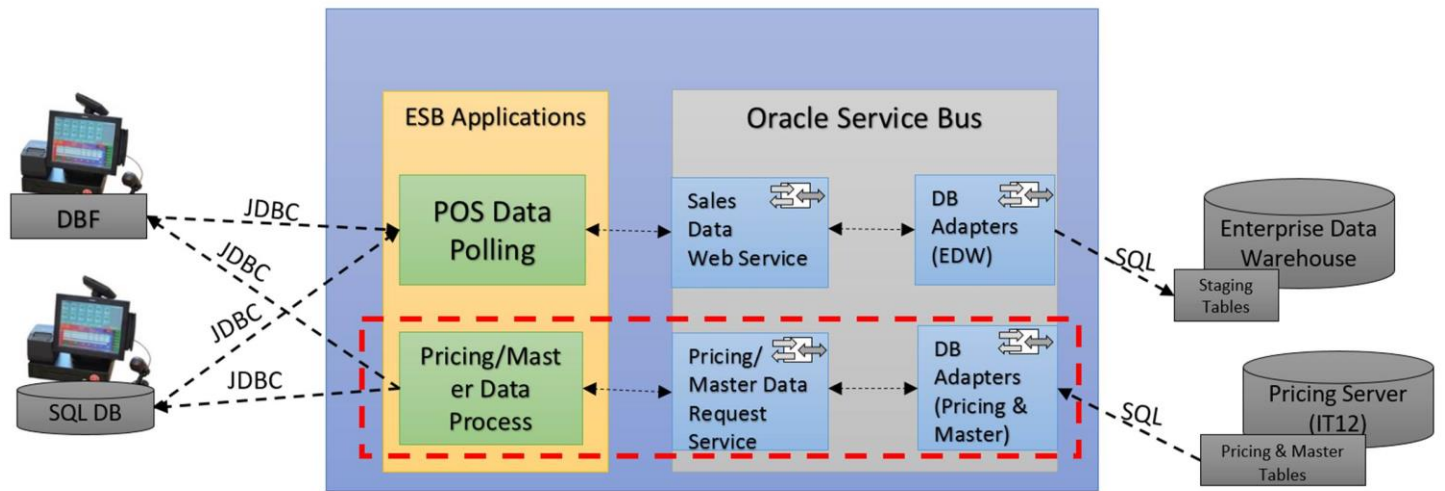
4.3 Pricing/Master Data

4.3.1 Pricing/Master Data Overall Process Flow

Pricing/Master Data Processing

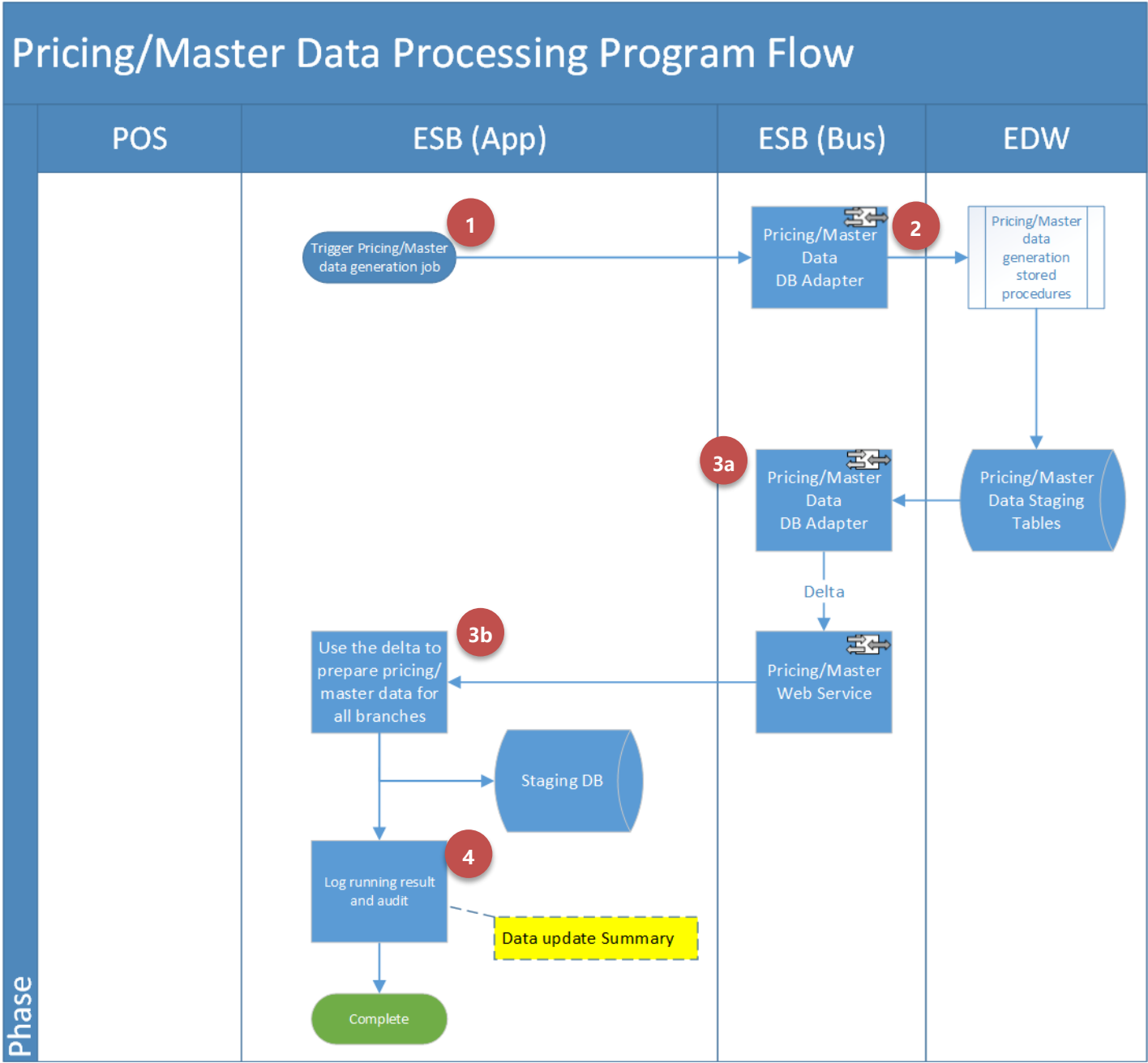


4.3.2 System context



4.3.3 Pricing data generation and download to Staging

4.3.3.1 Processing Flow



Task

Activity	Description	Type	Process Group/Owner
ESB triggers the Batch Processing against All Active POS Clients	<p>The pricing/master data distribution job pool is controlled by a centralized job controller which runs in a timed interval (separate the process from POS polling to avoid I/O conflicts).</p> <p>The job shall execute the relevant stored procedures (owned by Maxim's Pricing/Master server) to prepare and generate pricing/master data in IT12/IT50.</p>	Process	Sales Data Download to Staging DB – Carl
Ready the Pricing/Master data from Pricing data Server to Service Bus Working Database	<p>The Service Bus DB Adapter will monitor the data delta and periodically pull the pricing/master data from pricing server to service bus staging DB. The below steps would be taken.</p> <ul style="list-style-type: none"> a) Monitoring delta change in target table and invoke the consumer service b) Download the prepared data to staging DB (via SQL or Service) 	Input	Pricing/Master Data Distribution - Wing
Service Bus DB Adaptor Monitoring	Log down a job status and process summary of the Pricing/Master data downloading processing upon Staging DB.	Process	Sales Data Download to Staging DB – Carl

Role

Role	Description	Type
System Administrator	The user role has the right to access the admin function of the system, e.g. job control table configuration, data source schema control configuration, parameter configuration, etc.	Admin
System Operator	The user role has the right to conduct job re-run, job logs and dashboard; demand of daily summary report.	Operator
Pricing Server Support	The user role has the right to conduct job re-run, job logs the responsibility to receive pricing/master data related alert email.	Support

Application

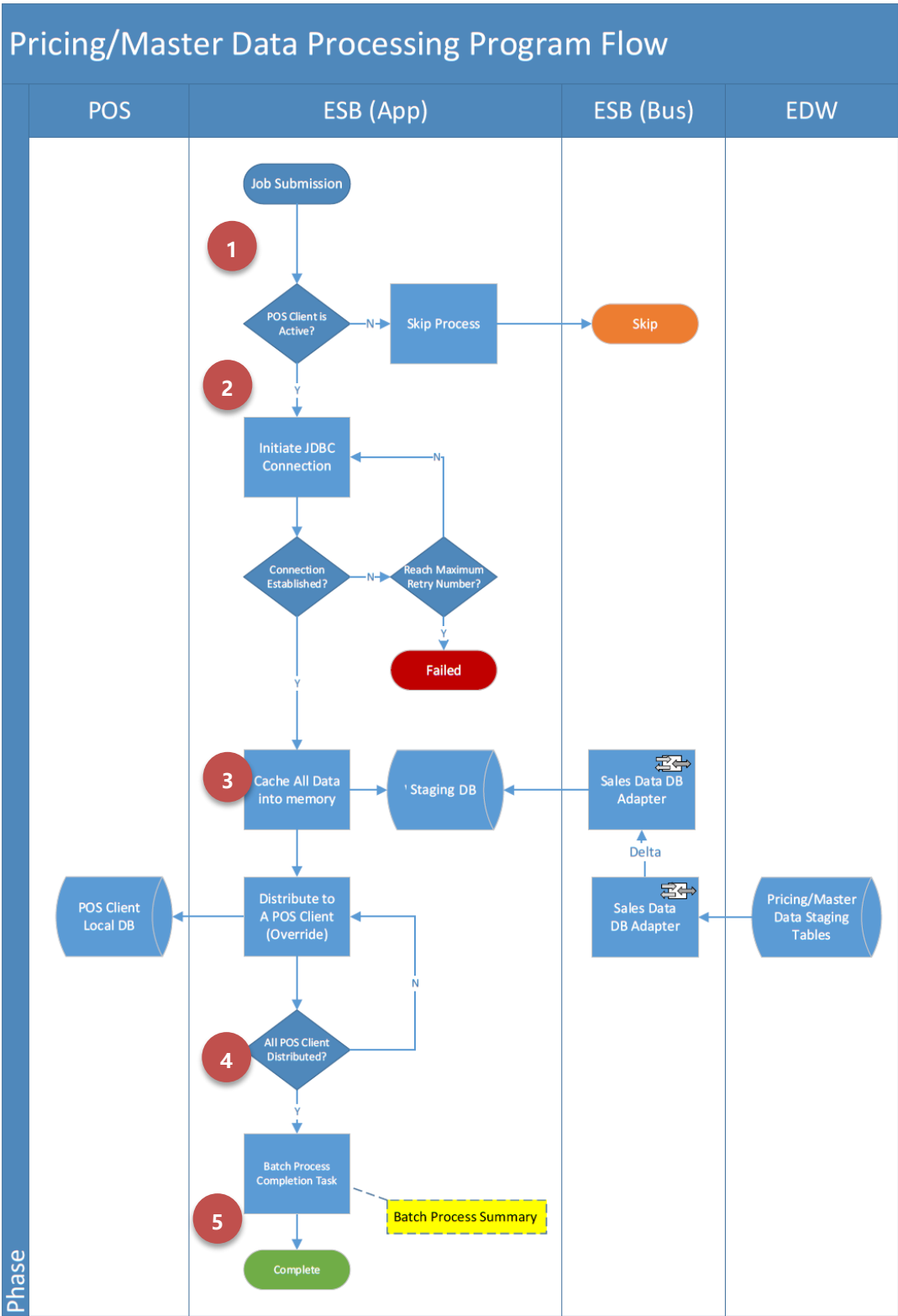
Application	Description
Polling Gateway	The application module responsible of downloading data from POS client.
Sending Gateway	The application module to carry out data pushing to service bus interfaces.
ESB Interfaces	The interface for data pushing from the Staging DB of service bus application layer to EDW.

4.3.3.2 Requirement Details

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-PRZ-REQ-01	Pricing/Master Data Processing	-	-	-	-	-
ESB-PRZ-REQ -01-01	Pricing/Master Data preparation	The service bus will trigger old stored procedure to trigger the pricing/master data preparation.	Must Have	Wing	The pricing/master data preparation process will be triggered by the pre-configured time (15mins or shorter).	ESB-PRZ-REQ-01
ESB-PRZ-REQ -01-02	Pricing/Master Data Download to Staging	After the pricing data is prepared, the service bus shall run an application download the full set pricing/master data from pricing server to Staging DB.	Must Have	Wing	On triggering the stored procedure, DB adapter to monitor the change in the pricing/master data tables and simulate the same operation on staging tables.	ESB-PRZ-REQ-01
ESB-PRZ-REQ -01-06	Pricing/Master Data Distribution Process	Update data synchronization status in Staging database and POS client.	Must Have	Carl	After the EOD data successfully sent to EDW, the sending result shall revert to service bus application's staging database, and correspondingly update the POS clients.	ESB-PRZ-REQ-01

4.3.4 Pricing/Master data distribution (Staging - POS)

4.3.4.1 Process Flow



Task

Activity	Description	Type	Process Group/Owner
ESB triggers the batch processing against all active POS client	<ol style="list-style-type: none"> 1. The pricing/master data distribution job pool is controlled by a centralized job controller which runs in a timed interval (separate the process from POS polling to avoid I/O conflicts). 2. The time trigger shall submit multiple jobs in the pool, which sequentially distribute pricing/master data to the POS client in round robin rules. 3. The job controller shall justify the job run rule according to the setting from the schema control table. 	Process	Sales Data Download to Staging DB – Carl
Distributing Pricing/Master Data to POS client	<p>Continue on #1 task, the submitted job will distribute the corresponding pricing/master data into the target POS client.</p> <p>Pricing/Master data will distribute to POS client in CSV format. (2 types of csv file). File format information to be provided by Maxim's IT.</p>	Output	Sales Data Download to Staging DB – Carl
Distribution job completion	Log down job status and process summary of the POS client for record tracking.	Process	Sales Data Download to Staging DB – Carl

Role

Role	Description	Type
System Administrator	The user role has the right to access the admin function of the system, e.g. job control table configuration, data source schema control configuration, parameter configuration, etc.	Admin
System Operator	The user role has the right to conduct job re-run, job logs and dashboard; demand of daily summary report.	Operator
POS Support	The user role has the right to conduct job re-run, job logs the responsibility to receive POS related alert email.	Support

Application

Application	Description
Polling Gateway	The application module responsible of downloading data from POS client.
Sending Gateway	The application module to carry out data pushing to service bus interfaces.
ESB Interfaces	The interface for data pushing from the Staging DB of service bus application layer to EDW.

4.3.5 Requirement Details

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-MST-REQ-02	Pricing/Master Data Processing	-	-	-	-	-
ESB-MST-REQ -02-01	Pricing/Master Data Distribution Process	The distribution process submitted by the job controller initiates a JDBC connection to update data into POS client.	Must Have	Carl	Assume the pricing/master data have the primary keys, the processing will update/merge the data by the reference keys to avoid override.	ESB-MST-REQ-02
ESB-MST-REQ -02-02	Pricing/Master Data Distribution Process	The process checks the total number of records to ensure the distribution is successful.	Must Have	Carl	Because there is no reference of the data indicating it is being distributed to one POS client, the process should check against the total number of records to ensure, the processing data are pushed to POS client. Transaction commitment control provided to avoid partially updated records.	ESB-MST-REQ-02
ESB-MST-REQ -02-03	Pricing/Master Data Distribution Process	Data process will use incremental update towards POS clients.	Must Have	Carl	System shall compare the data in Staging DB with data in POS clients and merge any changes continually.	ESB-MST-REQ-02

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-MST - REQ -02-04	Pricing/Master Data Distribution Process	Update data synchronization status in Staging database and POS client.	Must Have	Carl	After the Pricing/Master data successfully input into POS client, the sending result shall revert to service bus application's staging database.	ESB-MST-REQ-02
ESB-MST - REQ -02-05	EOD Process Job Summary	Job running summary will allow user to trace back the status and result of the schedule job.	Must Have	Carl	Update the job log to reflect the summary of the whole distribution process including Job run status Number of records processed Job name, e.g. Master – Staging – POS Job ID Job run error stage (if any) Error Category, e.g. DB, Network and Other, etc. Job start/end time (regarded as Coping to POS start/end time)	ESB-MST-REQ-02

4.4 Non-functional Requirements

4.4.1 Requirement Details

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-NF-REQ-01	Non-functional Requirements	-	-	-	-	-
ESB-NF-REQ-01-01	System Dashboard View – Real Time	The system dashboard for real time sales data processing shall show the summary of every full batch of jobs covering all the POS clients, and contain a brief summary of it.	Must Have	Maxim's IT	Initial design should contain information below for the dashboard purpose: 1. Because there are over 400 clients, so a combo box menu will allow user to select one batch, and system loads the summary info of the batch in the dashboard and a table. 2. The table will contain below column to show the job information: a) Data source name (branch name) b) Job start/end time c) Job status (Success/Failure) d) No of records processed	ESB-NF-REQ-01

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-NF-REQ-01-02	POS Data Source Control	The POS data source will have control indicators which enables the jobs easily manipulate them.	Must Have	Maxim's IT	<ol style="list-style-type: none"> 1. IsActive Indicator – the data source is active or not, if not active, the job will skip. 2. Polling Start/End time – this is to avoid useless jobs occupying system resource, to limit the jobs for certain data source only be submitted during a timed range. If user's requirement is 7x24, the initially set to 0:00-24:00. 	ESB-NF-REQ-01
ESB-NF-REQ-01-03	POS Data Source Control	For privacy concern, the password preserved in the data source control table shall be encrypted by private key.	Nice to have	Maxim's IT	Apply private key encryption to data source related password.	ESB-NF-REQ-01

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-NF-REQ-01-04	System Exception Report – Jobs Process	The job process exception shall be collected and viewable by the user according to the exception's severity.	Must Have	Maxim's IT	<p>The job process exception report should contain the information of exception occur in process logic, e.g.</p> <ul style="list-style-type: none"> - Network error (connection lost) - DB error (cannot access) - File error (file cannot read) - Interface error (fail to invoke service) - ... <p>These exceptions categorized by message severity and, the user could configure to justify above which severity, the job exception alert mail will be sent to application support team.</p> <p>For example, if the “send alert email severity” = 10, if error with severity ></p>	ESB-NF-REQ-01

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-NF-REQ-01-05	System Exception Report – Data Process	Before EOD process, if there's still discrepant data accumulated in the exceptional data table, the system shall send out a data exception report to application support team.	Must Have	Maxim's IT	The scenarios of data exception: 1. Data not match 2. The data cannot complete an entity relationship (e.g. order, trans, order pay) 3. The data does not have enough information for the interface (lack of mandatory fields for the web service call)	ESB-NF-REQ-01
ESB-NF-REQ-01-06	System Exception Handling – Jobs Process	Job processing retry mechanism - Real Time processing	Must Have	Maxim's IT	In real time process there won't be any retry mechanism for MITPOS because the batch of jobs has been running in a short time interval and next run will cover the data which was not processed in the last job	ESB-NF-REQ-01
ESB-NF-REQ-01-07	System Exception Handling – Data Process	Job processing retry mechanism, will be introduced into several stages - EOD processing	Nice to have	Maxim's IT	EOD process will allow user to trigger re-run (UI based), when encounter job failure, the system admin will manually submit the jobs to process the left data in previous failure.	ESB-NF-REQ-01

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-NF-REQ-01-08	System Job Control	Polling schema maintenance will provide a UI for system admin to maintain the polling schema	Low priority	Maxim's IT	<p>An user interface to allow system admin to manipulate the polling schema rules including</p> <ul style="list-style-type: none"> - Polling tables - Polling columns - Target tables - Target columns - Polling direction (inbound/outbound) 	ESB-NF-REQ-01
ESB-NF-REQ-01-09	System Job Control	The data source data could be initialized into the system by migration from Maxim's existing system called "Branch Master"	Nice to have	Maxim's IT	The service bus control of the POS client branch information will initiate from "branch master" or synchronized data from it as single info source.	ESB-NF-REQ-01

ID	Name	Description	Priority	Owner	Logic	Parent
ESB-NF-REQ-01-10	System Configuration	Define system's Configuration Items	Must Have	Maxim's IT	<p>Critical System Parameters will be stored in DB, e.g.:</p> <ol style="list-style-type: none"> 1. Staging DB Data Source User/Password 2. Number of Retry Limit 3. Housekeeping 4. Job Controller Time Interval for <ol style="list-style-type: none"> a) Polling process controller b) Distribution process controller c) Pricing/Master data preparation process d) Interface web service URL e) Encryption keys f) Support Teams Email 	ESB-NF-REQ-01

4.4.2 System Interface

#	Name	Description	Priority	Owner	Business Logic	Parent
ESB-NF-REQ-02	System Interface	-	-	-	-	-
ESB-NF-REQ-02-01	Sales Data Web Service	Web Service Interface allow external application calls to post a complete sales order data to EOD.	Must Have	Maxim's IT	Data completeness - the order has a payment record for the composited key.	ESB-NF-REQ-02
ESB-NF-REQ-02-02	Pricing/Master Data DB Adapter	DB adapter to trigger the stored procedures to prepare pricing/master data.	Must Have	Maxim's IT	Pricing/Master data generated in different groups.	ESB-NF-REQ-02
ESB-NF-REQ-02-03	Sales Data DB Adapters	DB adapters to query the total number of records being transferred in current EOD/real-time batch against the history tables.	Must Have	Maxim's IT	Query parameter is the current batch ID (if EDW tables cannot change, use business dates) and the branch number, and sum the transferred records to compare.	ESB-NF-REQ-02
ESB-NF-REQ-02-04	Sales Data DB Adapters	DB adapters to query the total amount of records being transferred in current EOD/real-time batch against the history tables.	Must Have	Maxim's IT	Query parameter is the current batch ID (if EDW tables cannot change, use business dates) and the branch number, and sum the total amount of transferred records in the target tables to compare.	ESB-NF-REQ-02

#	Name	Description	Priority	Owner	Business Logic	Parent
ESB-NF-REQ-02-05	Pricing/Master Data DB Adapter	DB adapter to update/insert convert log into EDW.	Must Have	Maxim's IT	After the EOD data transferred to EDW if total record count and total amount have been validated, update the convert log in EDW to indicate EOD data is ready for conversion.	ESB-NF-REQ-02

5 Sign Off

Description of Deliverable: Requirement Definition Document		
The requirements specification for the application.		
POS Part Sign-Off (Section: 4.2.3, 4.2.5, 4.3.4)		
<u>Name</u> (Print or Type)	Date	Signature
CARL CHOW		
Staging to EDW Part Sign-Off (4.2.4, 4.2.6)		
<u>Name</u> (Print or Type)	Date	Signature
POLLY KAM		
Others Sections Sign-Off (Others)		
<u>Name</u> (Print or Type)	Date	Signature
CHOI KA WING		
Project Director		
<u>Name</u> (Print or Type)	Date	Signature
LOUIS MAH		

6 Appendix A – Existing Polling Servers Overview



Maxim POS Study -
List of Study Items.xls

7 Appendix B – Data Process Flowchart



Data_Process_Flowch
artv01.pdf

8 Appendix C – EDW Virtual Branch Sales Inbound Tables



EDW - Virtual Branch
Sales Inbound_JOS_BI

9 Appendix D – POS Client Polling Table

<i>Table</i>	<i>Type</i>	<i>Update Freq.</i>	<i>Up/Down</i>	<i>Source</i>
ACCOUNTS	Master	Every Polling	Download	Carl
COUPON_CONTROL	Master	Every Polling	Download	Carl
COUPON_RANGE	Master	Every Polling	Download	Carl
CURRENCY	Master	Every Polling	Download	Carl
EMPLOYEE	Master	Every Polling	Download	Carl
HIST_CHECK_LOGS	HIST	EOD	Upload	Carl
HIST_COUPON_SALES	HIST	EOD	Upload	Carl
HIST_ITEM	HIST	EOD	Upload	Carl
HIST_ITEMSTOCK	HIST	EOD	Upload	Carl
HIST_ORDERS	HIST	EOD	Upload	Carl
HIST_ORDERS_EXTRA	HIST	EOD	Upload	Carl
HIST_ORDERS_PAY	HIST	EOD	Upload	Carl
HIST_ORDERS_PAY_PROGRESS	HIST	EOD	Upload	Carl
HIST_PAYFIG	HIST	EOD	Upload	Carl
HIST_PAYSUM	HIST	EOD	Upload	Carl
HIST_POSSYSTEM	HIST	EOD	Upload	Carl
HIST_REDEEMED_COUPON	HIST	EOD	Upload	Carl

Table	Type	Update Freq.	Up/Down	Source
HIST_SAFEBOXCHECK	HIST	EOD	Upload	Carl
HIST_SAFEBOXCHECKTENDER	HIST	EOD	Upload	Carl
HIST_SAFEBOXINOUT	HIST	EOD	Upload	Carl
HIST_SAFEBOXINOUTEXTENDINFO	HIST	EOD	Upload	Carl
HIST_SAFEBOXPICKUP	HIST	EOD	Upload	Carl
HIST_SESSIONINFO	HIST	EOD	Upload	Carl
HIST_SESSIONTENDER	HIST	EOD	Upload	Carl
HIST_STOCK_MOVEMENT	HIST	EOD	Upload	Carl
HIST_SUPP	HIST	EOD	Upload	Carl
HIST_TRANS	HIST	EOD	Upload	Carl
HIST_TRANS_ECARD	HIST	EOD	Upload	Carl
HIST_TRANS_MODIFIER	HIST	EOD	Upload	Carl
INVITATION	Master	Every Polling	Download	Carl
ITEM	Master	Every Polling	Download	Carl
ITEM_BARCODE	Master	Every Polling	Download	Carl
ITEM_MODIFIER	Master	Every Polling	Download	Carl
ITEMANLY	Master	Every Polling	Download	Carl
ITEMDEPT	Master	Every Polling	Download	Carl
MENU	Master	Every Polling	Download	Carl
MENUITEM	Master	Every Polling	Download	Carl
MESSAGES	Master	Every Polling	Download	Carl
MODIFIER	Master	Every Polling	Download	Carl
MODIFIER_GRP	Master	Every Polling	Download	Carl
MODIFIER_LIST	Master	Every Polling	Download	Carl
ONHOUSE	Master	Every Polling	Download	Carl
OPTIONS	Master	Every Polling	Download	Carl
ORDERS	Sales Data	Every Polling	Upload	Carl
ORDERS_EXTRA	Sales Data	Every Polling	Upload	Carl
ORDERS_PAY	Sales Data	Every Polling	Upload	Carl
PAYCAT	Master	Every Polling	Download	Carl
PAYMENT	Master	Every Polling	Download	Carl
PMT_ACTION	Master	Every Polling	Download	Carl
PMT_CONDITION	Master	Every Polling	Download	Carl
PMT_HDR	Master	Every Polling	Download	Carl
POSBUSDATE	Master	Every Polling	Download	Carl
ROLE	Master	Every Polling	Download	Carl
ROLE_PERMISSION	Master	Every Polling	Download	Carl
SUPP	Sales Data	Every Polling	Upload	Carl
SYSSETTINGS	Master	Every Polling	Download	Carl
TRANS	Sales Data	Every Polling	Upload	Carl

Table	Type	Update Freq.	Up/Down	Source
TRANS_ECARD	Sales Data	Every Polling	Upload	Carl
TRANS_MODIFIER	Sales Data	Every Polling	Upload	Carl
TRANS_TYPE	Master	Every Polling	Download	Carl
USER_PERMISSION	Master	Every Polling	Download	Carl
USER_ROLE	Master	Every Polling	Download	Carl
WIFI CODE	Master	Every Polling	Download	Carl

10 Appendix E – EDW Tables

Tables	Source	Matched with Polling Tables	Remark
HIST_COUPON_SALES	EDW	HIST_COUPON_SALES	EOD
HIST_ITEM	EDW	HIST_ITEM	EOD
HIST_ITEMSTOCK	EDW	HIST_ITEMSTOCK	EOD
HIST_ORDERS	EDW	HIST_ORDERS	EOD
HIST_ORDERS_PAY	EDW	HIST_ORDERS_PAY	EOD
HIST_PAYFIG	EDW	HIST_PAYFIG	EOD
HIST_PAYSUM	EDW	HIST_PAYSUM	EOD
HIST_POSSYSTEM	EDW	HIST_POSSYSTEM	EOD
HIST_REDEEMED_COUPON	EDW	HIST_REDEEMED_COUPON	EOD
HIST_SUPP	EDW	HIST_SUPP	EOD
HIST_TRANS	EDW	HIST_TRANS	EOD
HIST_TRANS_ECARD	EDW	HIST_TRANS_ECARD	EOD
HIST_TRANS_MODIFIER	EDW	HIST_TRANS_MODIFIER	EOD
ITEM	EDW	ITEM	Master
TRANS_TYPE	EDW	TRANS_TYPE	Master
COUPON_SALES	EDW	COUPON_SALES	Real Time
ITEMSTOCK	EDW	ITEMSTOCK	Real Time
ORDERS	EDW	ORDERS	Real Time
ORDERS_PAY	EDW	ORDERS_PAY	Real Time
SUPP	EDW	SUPP	Real Time
TRANS	EDW	TRANS	Real Time
TRANS_ECARD	EDW	TRANS_ECARD	Real Time
TRANS_MODIFIER	EDW	TRANS_MODIFIER	Real Time

11 Appendix F - Report Templates

	未能上數分店數量
香港美心西餅	3
東海堂西餅	3
廣州 Mei-Xin 西餅	4
總數	10

Convert Count		Green: 5% Yellow: 5-10% Red: >10%	
BU	Time	Converted (color of this column will be eliminated)	Expected
CAK	9:00pm	57	44
	10:00pm	122	94
	11:00pm	194	133
	12:00am	249	167
	01:00am	290	254
	02:00am	331	311
	03:00am	332	350
	04:00am	338	350
	07:00am	340	350
CHI	9:00pm	1	1
	10:00pm	2	1
	11:00pm	5	2
	12:00am	17	4
	01:00am	44	4
	02:00am	59	14
	03:00am	60	61
	04:00am	60	61
	07:00am	60	61
EUR	9:00pm	3	2
	10:00pm	5	6
	11:00pm	14	8
	12:00am	26	11
	01:00am	34	19
	02:00am	37	29
	03:00am	42	37
	04:00am	42	43

	07:00am	42	43
FFS	9:00pm	29	28
	10:00pm	52	46
	11:00pm	81	103
	12:00am	116	125
	01:00am	125	129
	02:00am	125	129
	03:00am	135	136
	04:00am	135	138
	07:00am	135	138
JCR	9:00pm	1	1
	10:00pm	4	4
	11:00pm	4	6
	12:00am	21	75
	01:00am	154	147
	02:00am	164	159
	03:00am	166	164
	04:00am	168	167
	07:00am	168	167
SBS	9:00pm	11	16
	10:00pm	16	37
	11:00pm	33	55
	12:00am	58	87
	01:00am	103	120
	02:00am	113	162
	03:00am	152	168
	04:00am	159	171
	07:00am	160	171

Error Log

Server / Job name	Check Time Failed /Stall		Action
udj_Gen_Pricing (HOPOS)	11/30/2016 9:47:55 PM Is failed	High Level Grouped Error Message such as: <ul style="list-style-type: none"> Change POS type (e.g. change from Qualicom to PointSoft) Password Setting in POS is incorrect and cannot extract data Network issue, ping failed Store did not perform day end process, need to split sales data Imbalance (missing data file/incomplete data files from POS machine) Invalid branch (not in our branch master/invalid length) -> data can be loaded to Oracle staging but convert log show "error" until POS vendor fix the issue. Invalid item code (not in our item master/invalid length) -> data can be loaded to Oracle staging but convert log show "error" until POS vendor fix the issue. 	11/30/2016 10:10:00 PM Rerun 11/30/2016 10:20:00 PM Call SA 11/30/2016 11:30:00 PM succeeded

Missed Branch (merged into error log)

	Branch	Name	Day end	Client Server	ping
GEN	6156	6156	2016/12/1 0:02	M6156	0%loss
SBS	4364	北衛星客運廊 Starbucks	2016/11/30 23:11	M4364_01	0%loss
EUR	1298		2016/11/30 22:40		
SBS	4609	Pacific Place	2016/11/30 21:50	m4609_01	0%loss
SBS	4432	Three Exchange Square	2016/11/30 21:47	M4432_01	0%loss
SBS	4302	Star Ferry	2016/11/30 21:39	M4302_01	0%loss
SBS	4626	MTR - Central	2016/11/30 20:59	m4626_01	0%loss
FFS	4692	Starbucks 寫字樓	2016/11/30 18:22	ITPOSTS	0%loss
SBS	4683	CORPORATE SALES	2016/11/30 17:49	ITPOSTS	0%loss
CAKE	3745	GZMTR- 芳村	2016/11/30 21:54	M3745_01	0%loss
CAKE	3476	金鐘站餅店	2016/11/30 21:38	M3476_01	0%loss
CAKE	5510	香港仔(東海堂)	2016/11/30 21:09	M5510_01	0%loss
CAKE	3133	竹園餅店	2016/11/30 20:21	M3133_01	0%loss
GEN	2822	2822	2016/12/1 2:50	M2822	0%loss
FFS	2222	杏花 MX	2016/11/30 21:54	M2222	0%loss
ICD	2881	瑞信銀行職員餐廳	2016/11/30 19:34	M2881	0%loss

*Figures appear in the reports shown in this section can be exported.

- End -