

Oracle® Retail MICROS Retail-J

Familiarisation

Release 12.1

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MICROS Retail-J

Familiarisation



MICROS Retail-J

Familiarisation

July 2014

Purpose of the Session



- Offers a conceptual framework of Retail-J and the environment in which it operates
- Exposes some of the terminology used within the application
- Drills-down into the some of the key areas of Retail-J

- Introducing Retail-J**
- Release Components**
- Deployment Topology**
- Messaging**
- Data flows**
- Notable Tables**
- Processes**
- Roles**
- POS**
- Cash Management**
- Card Payments**
- Inventory**
- Interfaces**

Introducing Retail-J

Note: The rebranding for the latest version of this documentation set is in development as part of post MICROS acquisition activities. References to former MICROS product names may exist throughout this existing documentation set.

- Retail-J is a POS and Back office store system developed in 2001.
- Online POS, HHTs, laptops and store back office applications are run centrally from Estate Manager, with all parts of the system linked together by Retail-J's integrated communications.
- Estate Manager enables online central management and control of multiple store fascias and formats from a single set of servers.
- Configuration, management, maintenance and support of Retail-J is controlled from the Estate Manager's browser-based user interface.

- 3 tier Java application (POS/Store/Estate) for retailing
- Identical software on each tier (switch on what you need)
- In-built resilience to network failures (local storage)
- Near real-time (trickle-feeds move transaction data upwards)
- Portfolio of configurable store applications based on a common set of foundation classes, message processing and data interfaces
- In-built L10n and I18n
- Interface focus consuming and using web services; using file imports and exports as either the recipient or source for third party applications. Can be a full (stand alone) or partial (hub connected and integrated) solution.
- Thick or Servlet POS

- Atelier (workshop tailored goods)
- Hospitality (table layouts, kitchen printing, split billing)
- Airports (sales restrictions, terminal, zone and flight organization for destination pricing)
- Telecommunications (option products and associated workflows, product serial number tracking,)
- Timber Sales (chain of custody)
- Electrical (WEEE charging)
- Fashion Goods (multiple product attributes including range, size, shape, colour; fuzzy search)

Standard POS Features:

- Cash & Tender Management
- Returns
- Price Management
- Discounts and Promotions
- Electronic Voucher Tracking
- Reports – Automatic & Ad hoc
- Credit Authorisation
- Chip & PIN

Specialist Functionality:

Product Linking, e.g. phones to accessories

Workflow Transactions:

- Linking products to contracts
- Linking products to services e.g. insurance
- Customer Surveys
- Liquid Restrictions (airlines)

Serial Number Capture:

- IMEI numbers
- IMSI numbers

Commission Selling

Location Management Profiles











Enhanced Customer Service Capability:

- Product and Fuzzy Search
- Stock Locator at the POS
- Customer Orders, Quotes, Layaways
- Customer Accounts, Loyalty
- Gift Cards and E Top-Up
- Tax Free Shopping
- Multi-Media
- Weigh Scales

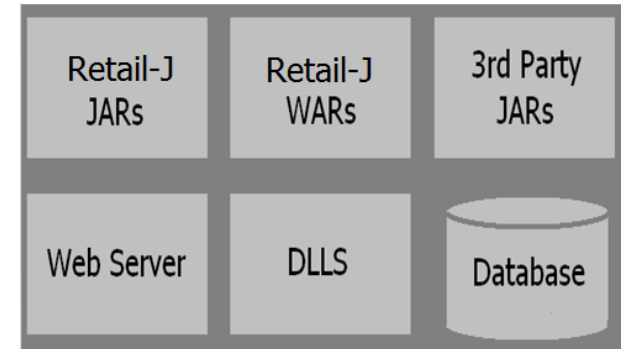
Store Management:

- Time & Attendance
- Store Inventory
- Stock Transfers
- Stock Counting
- Store Diary
- Employee / User Set up
- KPI's
- Email and Instant Messaging
- CCTV Integration
- Store Manager Portal
- Mobile Devices – HHT's, tablets, PDA's, laptops
- Management Alerts

Release Components

Name	Date modified	Type
 data	22/05/2014 16:34	File folder
 jdk1.6.0_41	30/04/2014 18:46	File folder
 TOMCAT	30/04/2014 18:29	File folder
 CompanyReg	01/05/2014 18:36	Internet Shortcut
 Device Details	01/05/2014 18:37	Internet Shortcut
 manifest.xml	07/05/2014 15:55	XML Document
 retail-j	01/05/2014 18:37	Internet Shortcut
 StartTPOS.cmd	08/05/2014 20:40	Windows Command Script
 TomcatStart	01/05/2014 18:17	Shortcut
 Upgrade Database.cmd	28/01/2013 17:23	Windows Command Script

Retail-J Release Components



Each device will have installed:

- JAVA – dependant on Retail-J configuration a particular version would be used e.g. Java 1.5, 1.6 etc.
- WebServer - (usually Tomcat)
- DLLs
- Retail-J JARs
- Any third party JARs
- Retail-J WARs
- Database – (EM – SQL Server) (Store Server / POS – MySQL)
- Supporting scripts

The JAR and WAR files contain the code that makes up Retail-J and so all the functionality that comes as standard

JAR files

- Contain the core code which runs the system(code engine)
- Main JAR file is the `rjRetailFoundationClasses.jar`
- `rjMegaRetailer.jar` (for example) contains bespoke development

WAR files

- Contain JSPs (GUI)
- Contain Web Services functions

All devices contain the same JAR and WAR files

JAR files, additional to those provided by Retail-J, are required to:

- Connect to the database (JDBC drivers for SQL DB - sqljdbc.jar)
- Gain access to FTP services (FTP.jar, FTP2.jar)
- Connection to 3rd party systems such as QAS or Solve (qas.jar, SolveLink.jar)
- Support for peripherals (either JPOS or directly driven)

The exact number and types of 3rd party JARs required in any given install depend on the setup of the system

Unnecessary and optional JARs should not be put onto a system

The purpose of the Web Server:

- Serves the Retail-J Back Office UI (Browser based)
- Runs the Retail-J background processes (XML Processing)
- Hosts the Retail-J Web Services

The Tomcat Web Server can be started via:

- A script
- A service

Usually configured to start automatically (as a Windows service) when a machine is powered up.

DLLs or Windows drivers required in order for Retail-J to interact with other pieces of software and hardware components

- Win32com.dll required on tills for connection to peripherals via a COM port
- JBrowser.dll required on tills to enable Internet Explorer to be viewable from within POS Application. This is useful to view the BackOffice from within the POS screen

- The manifest file is an XML file which contains the version number of Retail-J
- Used as part of the Software Update Process (SUP)
- The filename of the manifest file is manifest.xml and is located in <RJAppHome>/

The Retail POS properties file:

- Defines the Application Installation directories
- Defines the unique Device ID identifier, Example - ALL.<ORG_ID>.0100.101
- Allows the addition of specific debug
- Specifies customer specific functionality
- Customise the POS UI:
 - POS Font Types / Sizes
 - Button Colours
 - POS screen size

The filename is `com.retailJava.javaPOS.properties` and is located in `<RJAppHome>\Libs1` (locations may vary)

Access sets are required to allow Retail POS to connect to the appropriate instance of the database

The access sets contain

- The database connection string (location of the database e.g. local host and port number)
- The credentials to connect to the database in encrypted format (user name and password)

The access set reside in the <RJAppHome>\Data

Two files make up the access sets, namely:

- Access.hdx
- Access.dat

Access Sets are created as part of the Installation process but can also be recreated manually if the database password is changed

- Types of database:
 - Operational
 - Audit (Estate Manager only)
- Database agnostic
 - Microsoft SQL Server
 - MySQL
 - Oracle
 - DB2
- Database schema the same across the entire estate
- No referential integrity, No foreign keys.
- Most data stored in XML (CLOB)

- By default is named with the Organisation ID
- Stores all configuration including (amongst others):
 - **Products**
 - **Prices**
 - **Reasons**
 - **Users**
 - **Tendering Information**
- Contains majority of tables
- Present on all thick-client instances of Retail-J

- By default is named with the Organisation ID followed by _AM
e.g. DOC_AM
- Validates Transactions against set rules.
- Validates Cash Management Actions against set rules.
- Used to construct card data for submission (APACS29).
- Used to construct inventory information exports.
- Used to run reports from.
- Schema a cut-down version of the Operational Database
- Only present on an Estate Manager
- Can be written to at the same time as the Operational Database or transactions can be placed in their own processing queue.

Not Supplied but Essential

- Web server start-up script
- Database upgrade script
- Organisation registration shortcut
- Device registration shortcut
- TPOS start-up script

Prerequisites

- Installed database
- Licence key
- Organisation ID

Why does a device need registering?

A device requires registration in order to identify the device within the network and set administrator user credentials.

Re-registering of a device may occur when web cookies have been deleted from a browser

How to register a device?

- Logon to the back office
- Specify:-
 - Device ID i.e. ALL.TOREX.xxxxx (where x represents the store id e.g. Manc = S4403)
 - Device Name i.e. EM, or Store etc.
 - Retail-J admin username
 - Retail-J admin password
 - Organisation ID i.e. Torex

Device Registration Responses

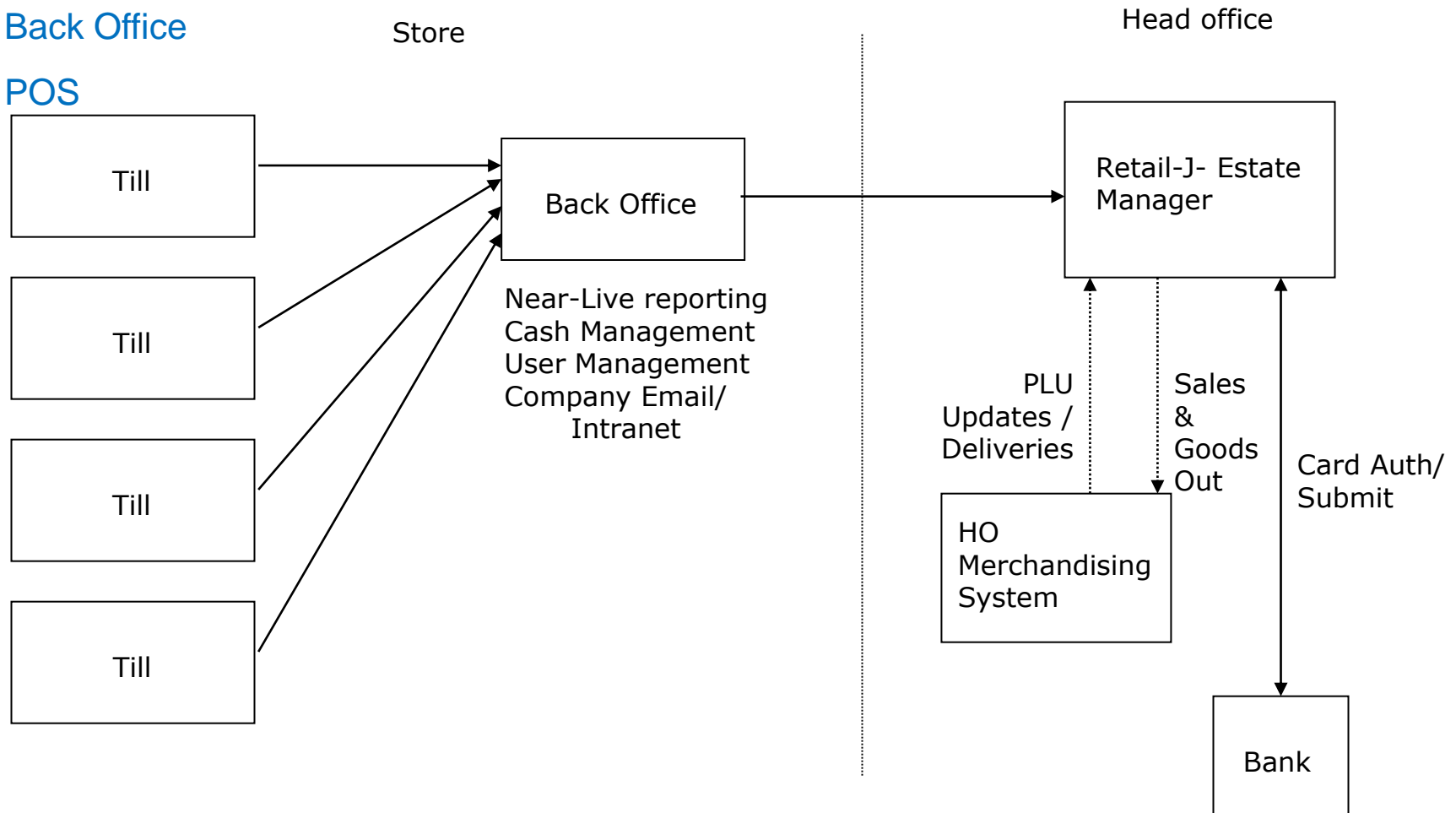
- Device registered successfully in which case refresh the browser to proceed to the logon screen
- Failed to connect to data store
 - Check registration details – most likely incorrect device ID, user/password credentials or organisation ID

Deployment Topology

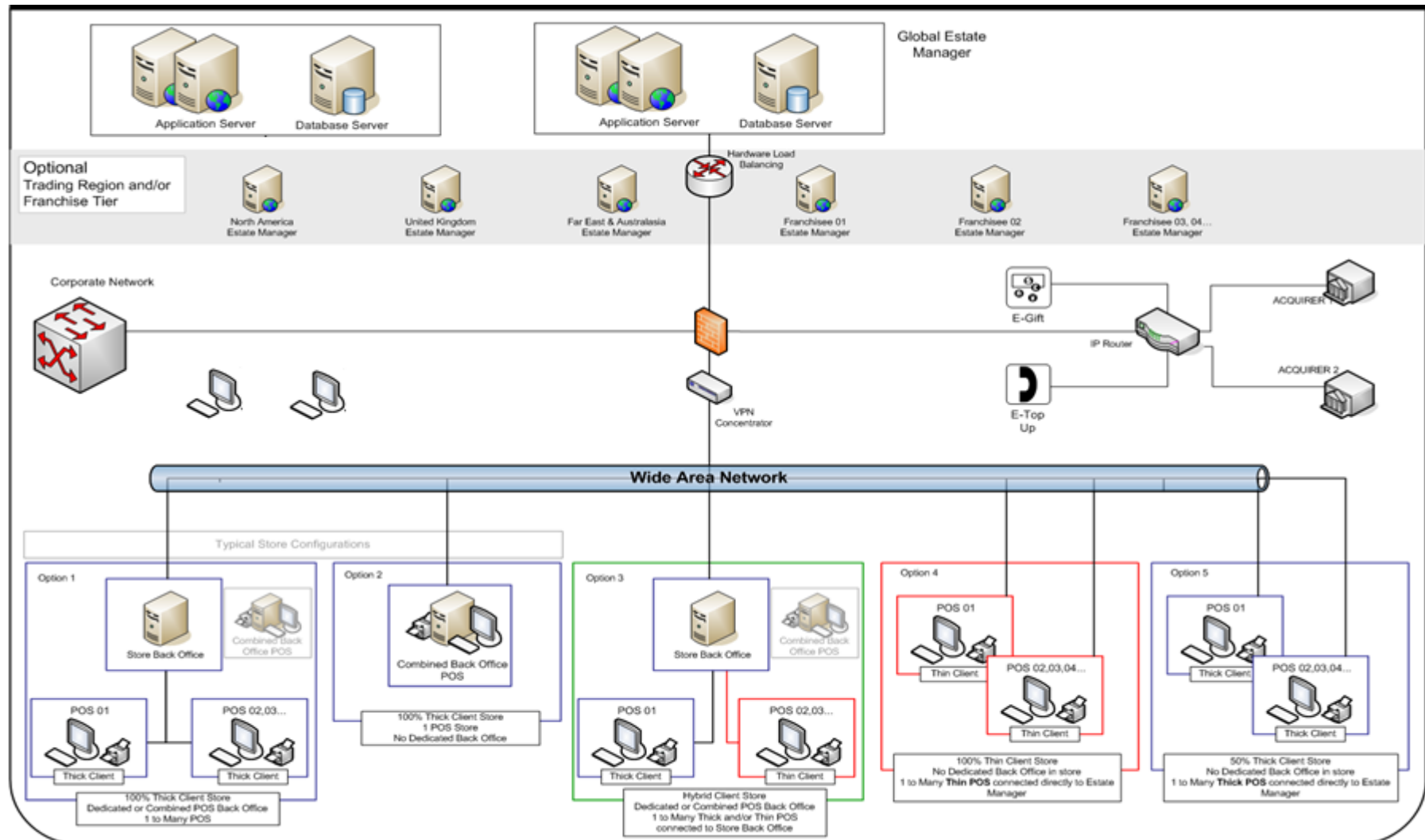
Deployment Topology

Retail-J is typically a 3 tier architecture

- Estate Manager (EM)
- Back Office
- POS

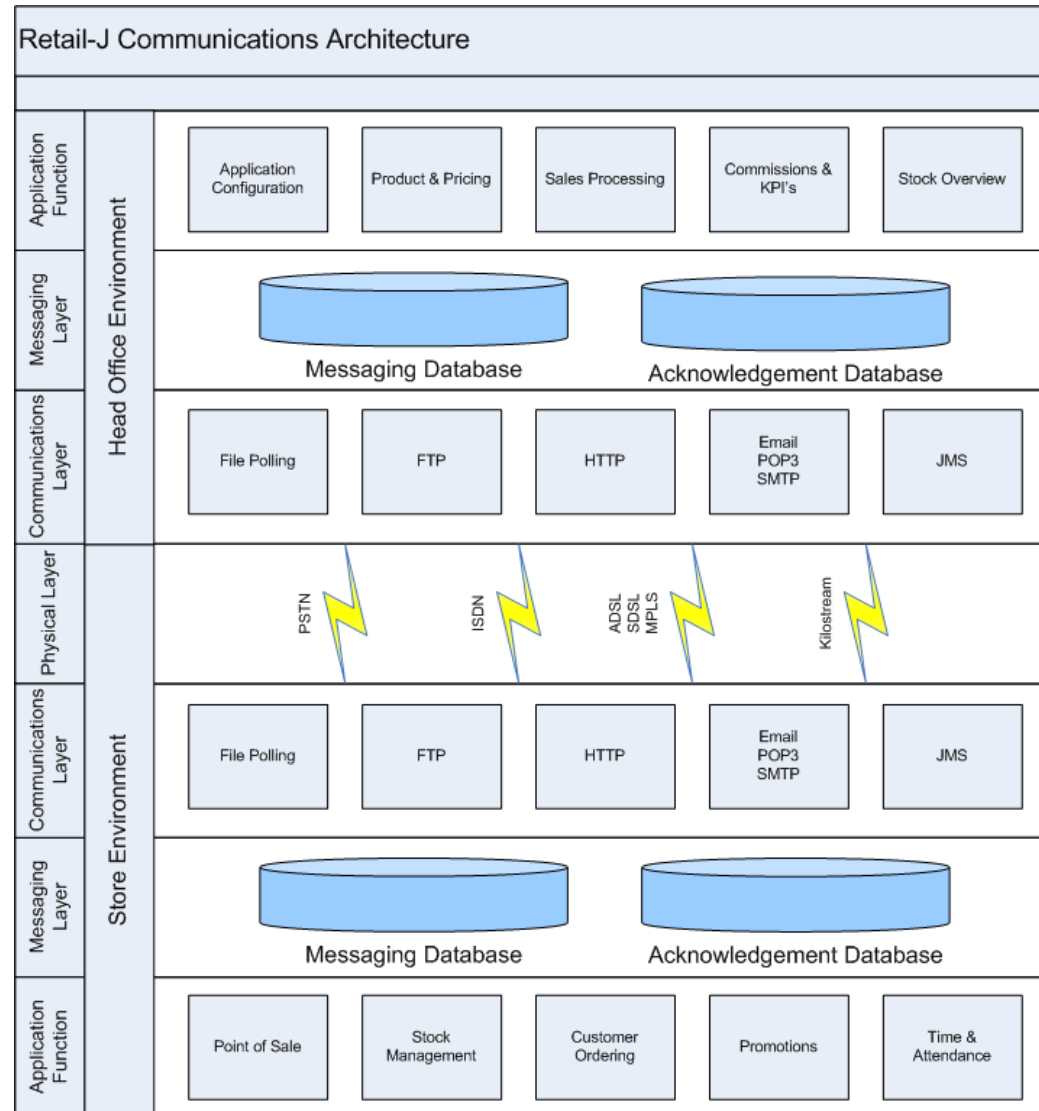


Deployment Topology in Practice

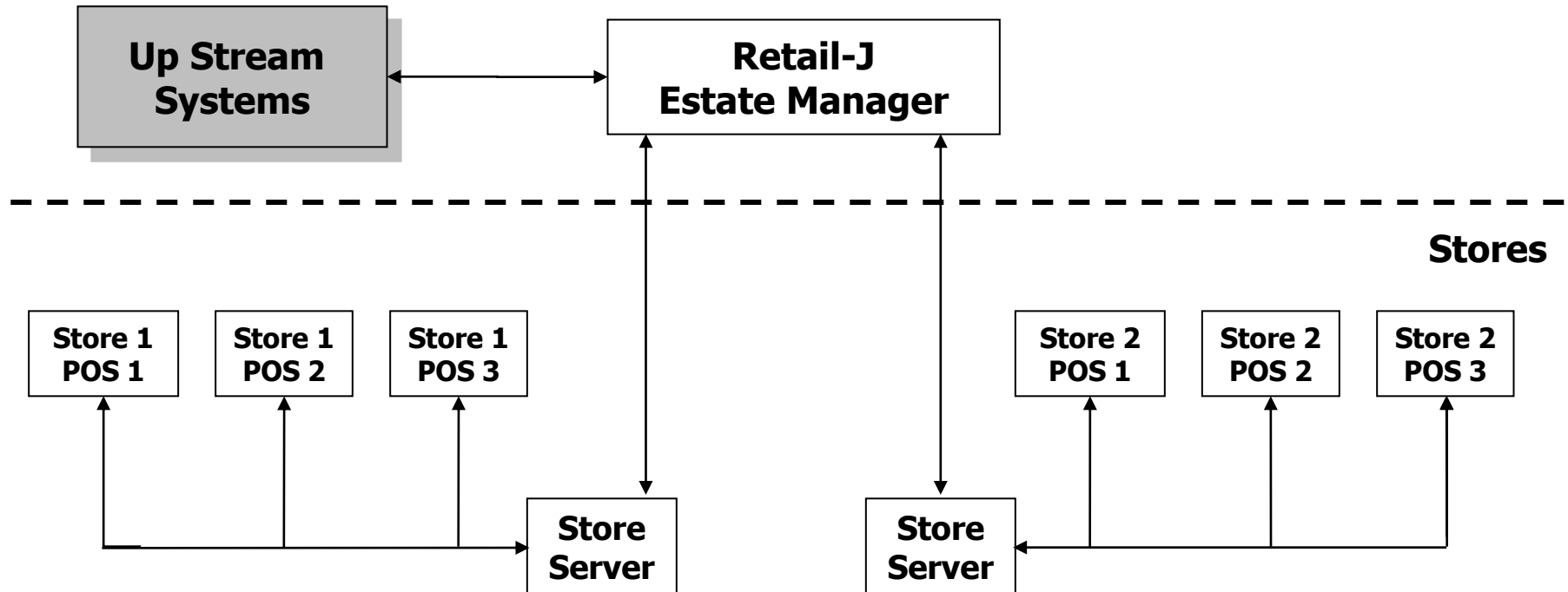


Messaging

Communications Architecture



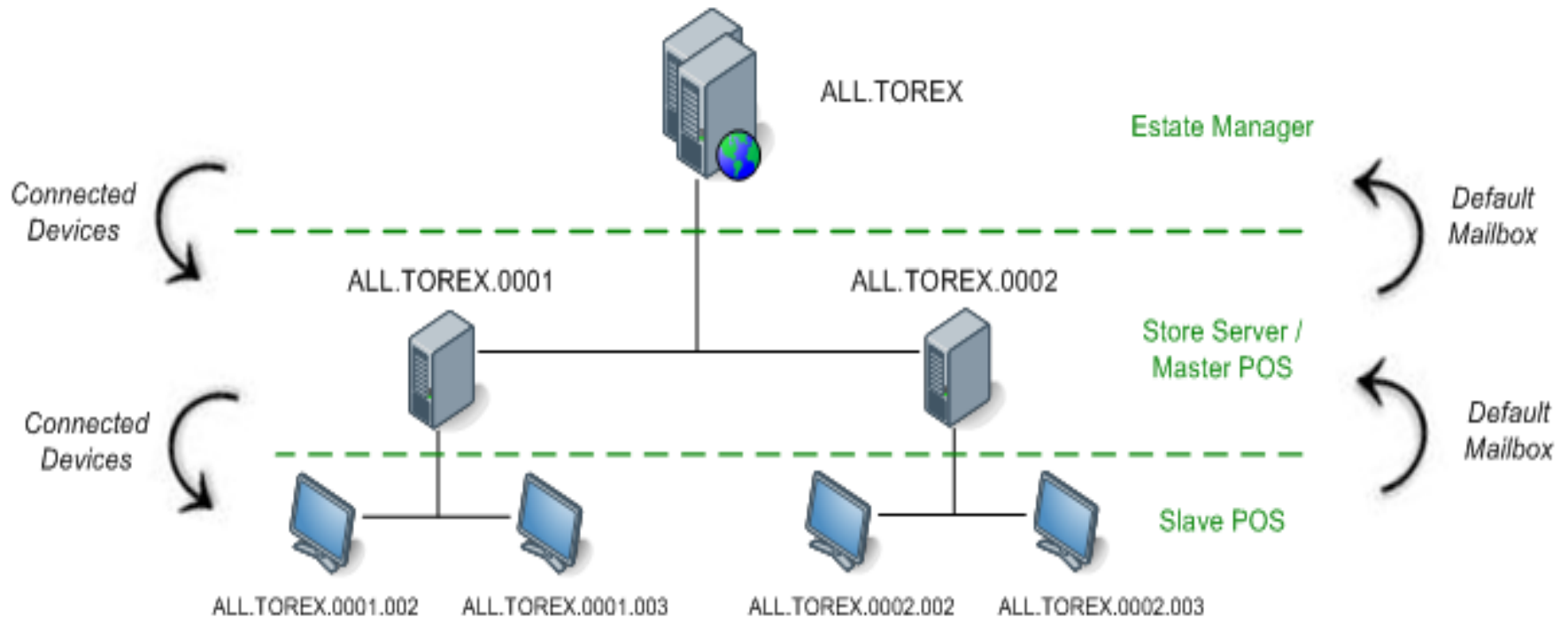
Head Office



All hardware with Retail-J installed is identified as a Device

Device	Example ID
Estate Manager	ALL.<ORGID> Where <ORGID> is the organisation ID
Store Server	ALL.<ORGID>.XXXX Where XXXX is the store Example: ALL. <ORGID>.0100
Tills	ALL.<ORGID>.XXXX.YYY Where YYY is the Till Example – ALL. <ORGID>.0100.101

Message Flow



The Messaging System

- Routes messages to defined mailboxes within Retail-J
- Message – XML entity
- Messenger – the server
- Messaging system supports HTTP(S), (S)FTP and email.
- Messages are accumulated offline and forwarded when a connection is available
- Acknowledgements are sent only when the destination has read and processed the message

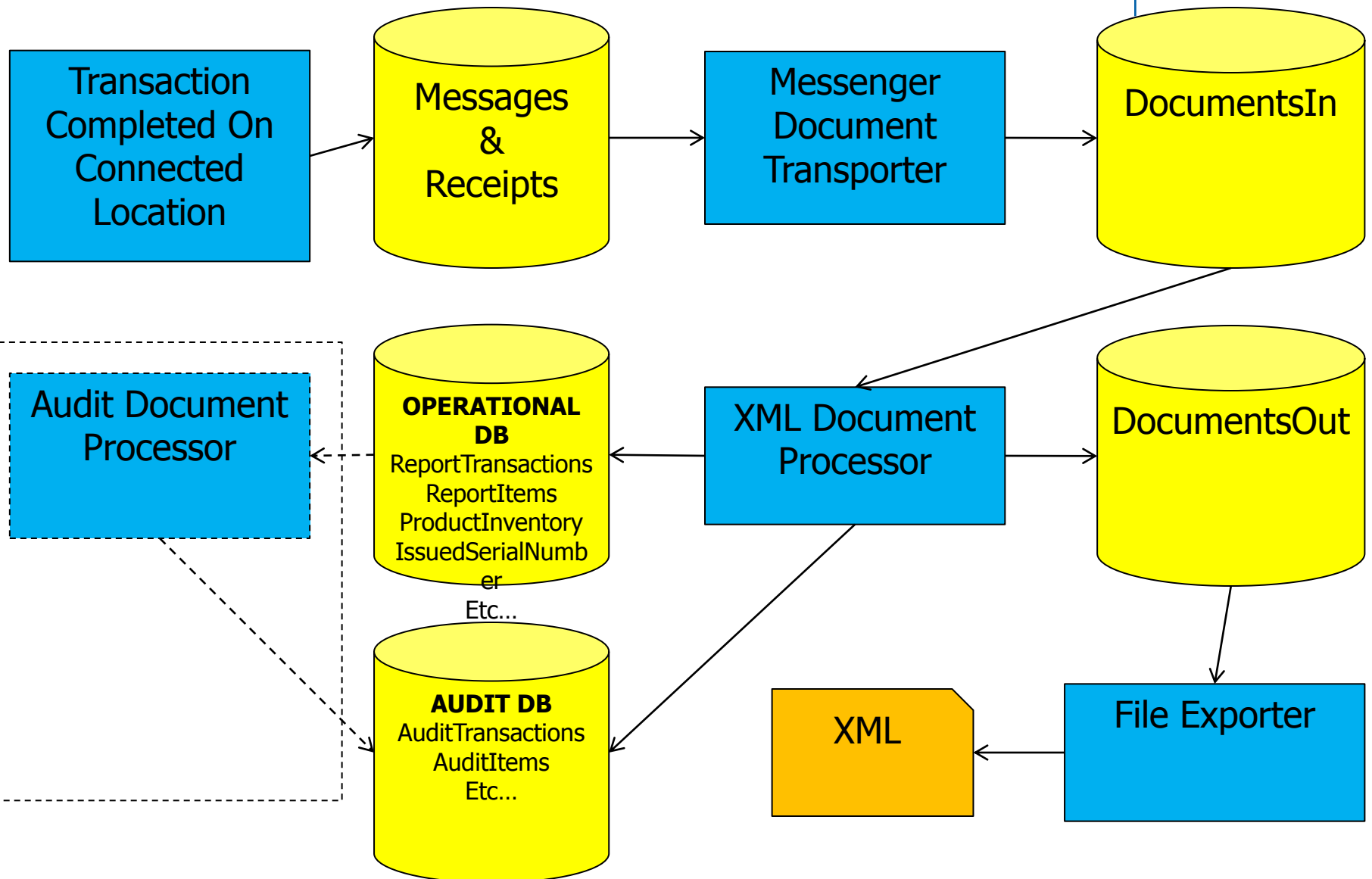
Setting up Mailboxes and Routing

- Each device has a/an:
 - Default mailbox e.g. ALL.DOC.S0001 (to determine where any unroutable messages should be sent)
 - Local LER mailbox e.g. ALL.DOC.S0001.LER
 - Local XMLPROCESSING mailbox
 - One or more Connected Devices mailboxes to accept messages routed from any mailbox or child of that device e.g. ALL.DOC and ALL.DOC.S0001.T1

Data Flows

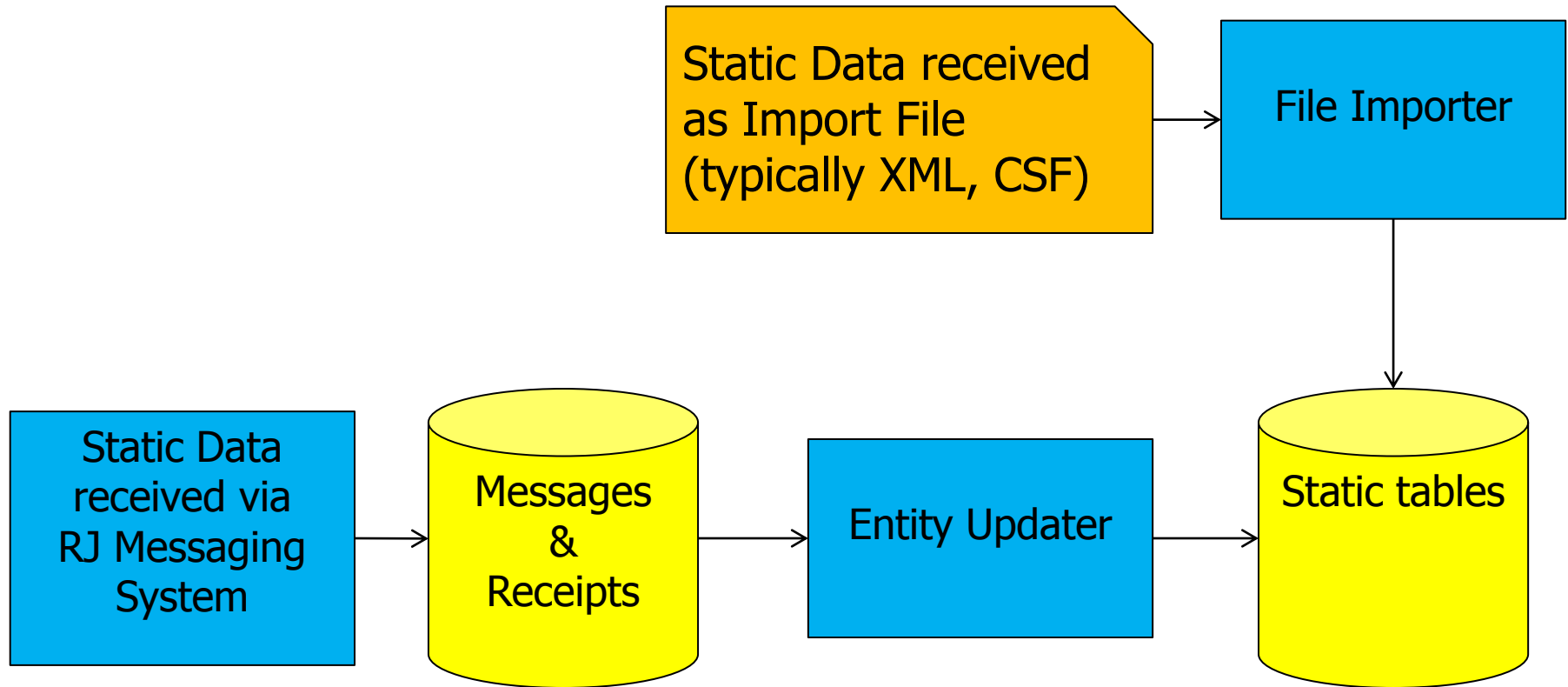
Retail-J Transaction Processing Data Flow

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Retail-J Static Data Processing Flow

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- XML Document Processor
 - Processes the documents that have been inserted in to the DocumentsIn table. Once the documents have been processed they are written to the DocumentsOut table ready to be sent to the EM or exported to a third party application.
- Entity Updator
 - Applies the configuration changes delivered from the messaging system to the database. If the entity updator is not running, the database will not be written to. The process picks up messages destined for the 'LER' mailbox.
- File Importer
 - Processes import files containing static data such as a CSF broadcast or product price updates. The files can be in either ZIP or XML format but must adhere to the Retail-J schemas.
- File Document Transporter
 - This process will import files and export files from Documents Out. The Process writes documents directly into and out of Documents In and Documents Out as opposed to processing the files itself.
- Message Document Transporter
 - Responsible for converting the documents into messages

Notable Tables

- Used to hold the XML data held in the message queue
- Contains both incoming and outgoing data. Both dynamic and static data.
- Messages automatically purged after seven days
- Linked with the Receipts table using the messages.id field and receipts.messageID

- Holds the mailbox details for each message in the receipt table
- Not to be confused with physical receipts from the tills
- Each mailbox has a status:
 - 1 – Unsent
 - 2 – Sent
 - 3 – Acknowledged
- Receipts automatically purged after seven days

- Stores all dynamic data (transactions) for the 'XML Document Processor' to process.
- 'Messenger Document Transporter' writes to the table, inserting the XML of the transaction and setting the status to 1 (Received).
- 'XML Document Processor' reads from the table, processes the transaction then sets the status to 2 (successful)
- Any failures are set to status 3 (failed).
- If database problems (such as locks) are detected, the status is set to 4 (Lock Error). Any transactions with a status of 4 are periodically reset to status 1.

- XML Document Processor writes to this table once the documents in the DocumentsIn table have been successfully processed.
- Contents of this table are identical to DocumentsIn
- Table used to store the outbound transactions
 - If on a Master Till, the transactions may be output or sent to the Estate Manager.
 - If on an Estate Manager, the transactions may be output for the data warehouse or other Head Office system (e.g. SAP)
- Status codes same as for DocumentsIn.

Stores every basket transaction in XML format

Used mainly for refund purposes but also for orders, layaways, gift lists etc.

Used as a means to eliminate duplicate transactions being processed

Child tables include:

- BasketExtendedInformation – stores customer details such as name and postcode for the basket
- BasketCards – stores any card details contained in the basket to allow a quick lookup to be performed at the till against a given card number. **Note restrictions on the storage of card numbers and sensitive cardholder data.**

REPORTTRANSACTIONS



- Used to store transactions for the purposes of reporting against.
- No XML so queries are efficient.
- Most XML elements in a transaction are separated into their own columns.
- Only written to by the XML Document Processor
- Contains the details of the transaction, not the individual items within the transaction.
- Primary key is ReportTransaction_ID column
- Examples of types of transactions:

POS basket	Cash pickup
Order	Cash reconcile
Layaway	Pickup correction
Product wastage	Income
Cash open session	Expense
Cash Number	

- Child table of ReportTransactions table
- Contains item level transaction details (such as cash payment, card payment, item sale etc)
- Linked to ReportTransactions using the Report_Transaction_Id column.
- No referential integrity by design
- No XML

Processes

Configured Through: Administration > Processes > Process configuration

Stop/Start & Read Logs: Administration > Processes > Process Management

Types:

Pre-configured process – set up in process configuration screen

Event driven processes which appear, run and disappear as they are needed

Run:

Automatic – when Retail-J is first started.

Manual – Through the Process Management screen

When an event occurs – i.e. a broadcast being started.



Changes to process config only come into effect when the process stopped & restarted

Core RJ Database Processes (see earlier slide)

FTP replicator

- Grabs exported CSF (comma separated) files provided by the estate manager.

HTTP messenger connector

- Responsible for moving document messages to the EM

Queued job feeder

- Manages jobs created with the job management function i.e. running of a broadcast or weekend job task.

Software update process

- Responsible for managing the receipt, activation and successful application of Software Update Files.

Starting Processes from the Command Line



```
webserver
Process Management Command Line Interface

java ...ProcessManagementClient <device_id> <host_name> <action> <parameter>

where <action> = LIST, START, or STOP
for <action> = LIST, <parameter> = ACTIVE, INACTIVE, or ALL
for <action> = START or STOP, <parameter> = process ID or ALL

The case-sensitive process IDs are :-
AuditDataExtractionProcess AuditDataFinaliseProcess
AuditTransactionProcessingProcess AuditValidators AutomaticReportsProcessor
BatchBroadcasterProcess BatchDocumentExportProcess Broadcaster
CardDataExtractionProcess CardDataOutputProcess CardDataSubmissionProcess
CardSubmissionProcess CashSessionValidator CommissionsCalculatorProcess
DOSPOSListenerProcess DayEndScheduler DayStartScheduler
DownloadSchedulerProcess EmailConnectorProcess EmailDocumentTransferProcess
EmployeeBalanceAdjustmentProcess EncryptionKeyImportProcess
EnhancedHTTPConnector EntityExporterProcess EntityUpdater FTPConnectorProcess
FTPImporterProcess FTPReplicatorProcess Feature Pack Importer
FeatureItemPurgeProcess FeaturePackValidator FileConnectorProcess
FileDistributorProcess FileDocumentTransferProcess FileExportProcess
FileExporterProcess FileImportProcess HTTPConnector HTTPFileTransferProcess
HandPointListenerProcess IndexerProcess InstantMessageBroadcastProcess
InventoryTaskRunnerProcess JMSConnectorProcess JMSExporterProcess
JMSImporterProcess LoyaltyCustomerDetectionProcess
LoyaltyCustomerRegistrationProcess MessengerDocumentTransferProcess
MessengerFileTransferProcess MobilePOSDataExporterProcess POSApplicationProcess
PostponedTransactionValidator PredefinedReportExporterProcess
PrintQueueListenerProcess ProductPriceUpdateProcess PurgeRunnerProcess
QASPostcodeInvokerProcess QueuedJobFeederProcess QueuedJobRunnerProcess
RebuildBroadcasterProcess RemoteTerminalProcess ReplenishmentRequestProcessor
SoftwareUpdateProcess StockCountSnapshotProcess SystemStatusMonitorProcess
TransactionIntegrityValidator TransactionProcessingProcess WebMailProcess
WeekEndScheduler WorkflowScheduler XMLProcessingMessengerProcess
XSLTransformProcess
Press any key to continue . . . _
```

For a list of parameters:

```
%JAVA_HOME%\Bin\JAVA
com.retailJava.retailFoundatio
nClasses.systemManager.Process
ManagementClient
```

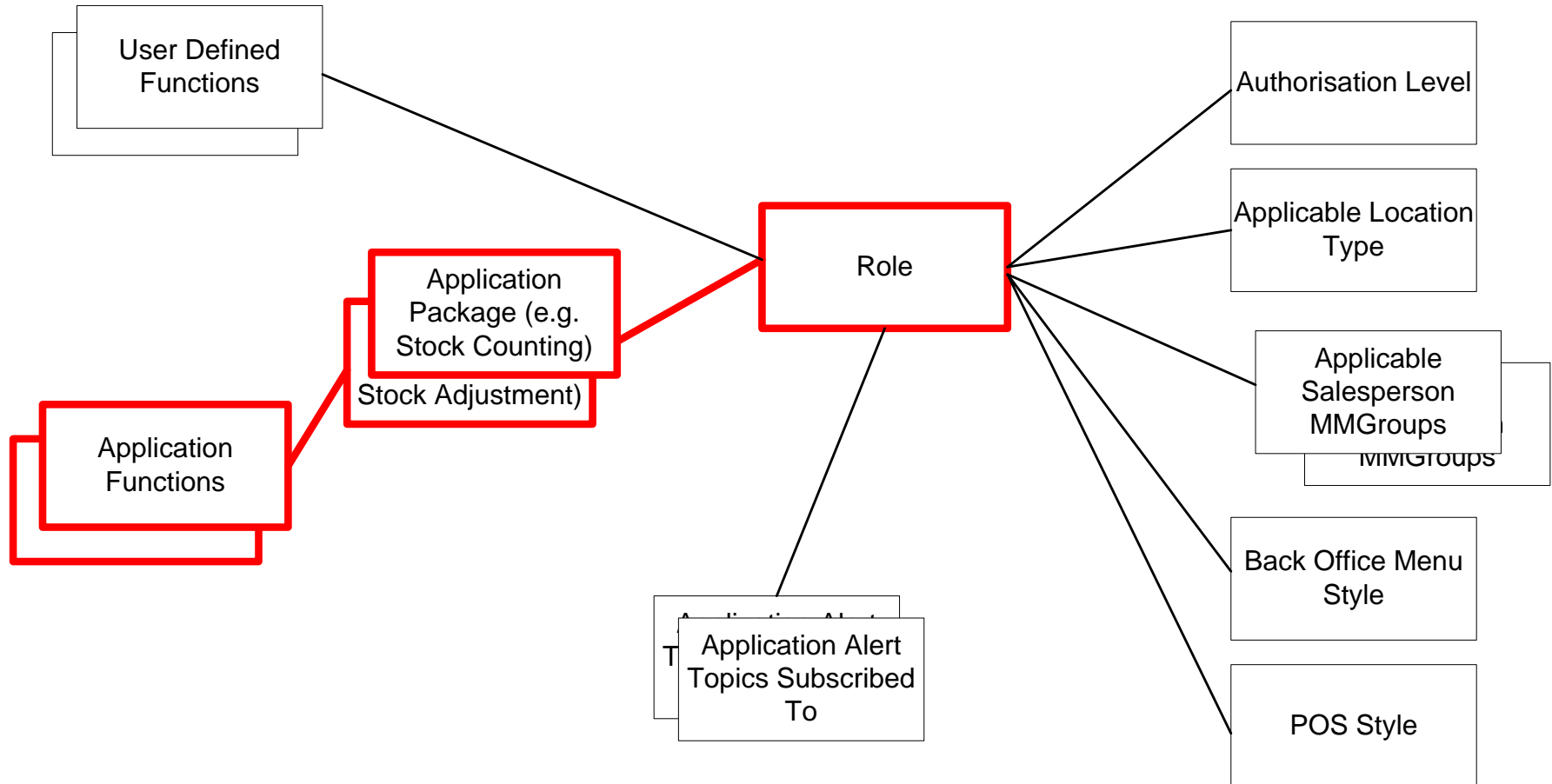
To stop all Retail-J processes:

```
%JAVA_HOME%\Bin\JAVA
com.retailJava.retailFoundatio
nClasses.systemManager.Process
ManagementClient ALL.R1511.S01
127.0.0.1 STOP ALL#
```

To just stop one, replace the ALL with a process name listed above.

Permissions

Role Based Permissions

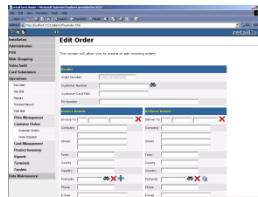


POS

- Thick/Client Master Till
- Servlet POS
- POS Configuration
 - Screen Layout
 - Prompts Workflow

POS – Thick Client/Master Till

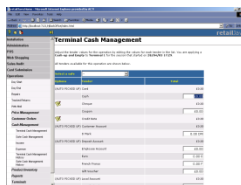
micros®



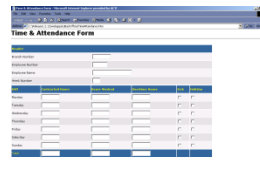
POS



Cash
Management



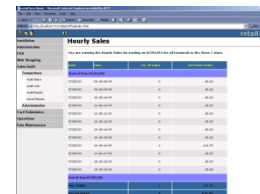
Time &
Attendance



Inventory



Reporting



POS – Servlet

BRANCH: 0001

TERMINAL: 00001

TRANSACTION: 00001

OPERATOR: 00001

24/09/2013

07:43

TAX:
BALANCE DUE:
No. of Items:

£ 0.00
£ 0.00
0

⌨

Please enter / scan a PLU

789

456

123

0.

CLR

ENTER

ITEM ONE

ITEM TWO

ITEM THREE

ITEM FOUR

ITEM FIVE

ITEM SIX

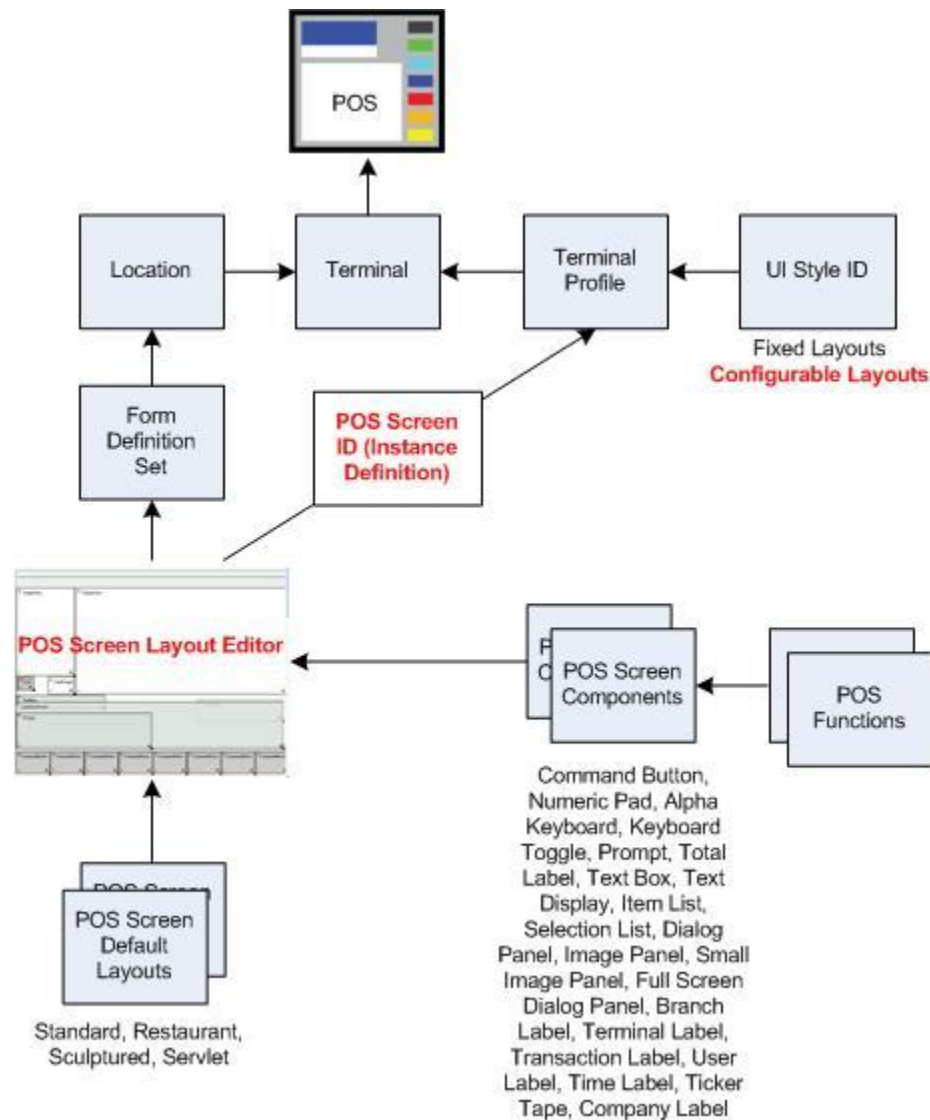
ITEM SEVEN

ITEM EIGHT

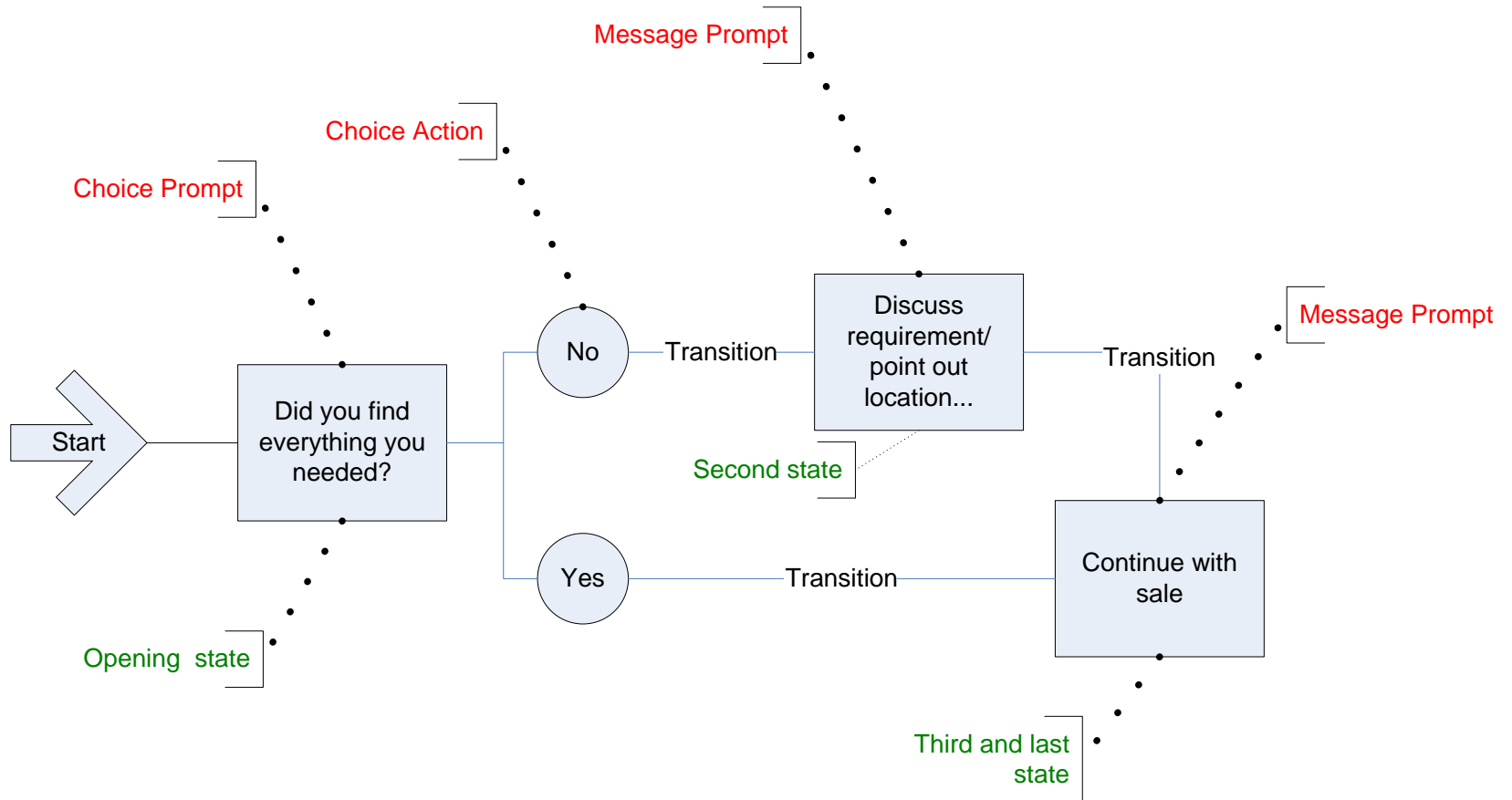
TOTAL: £ 0.00

micros  Retail-J v12.1

POS – Layout Designer



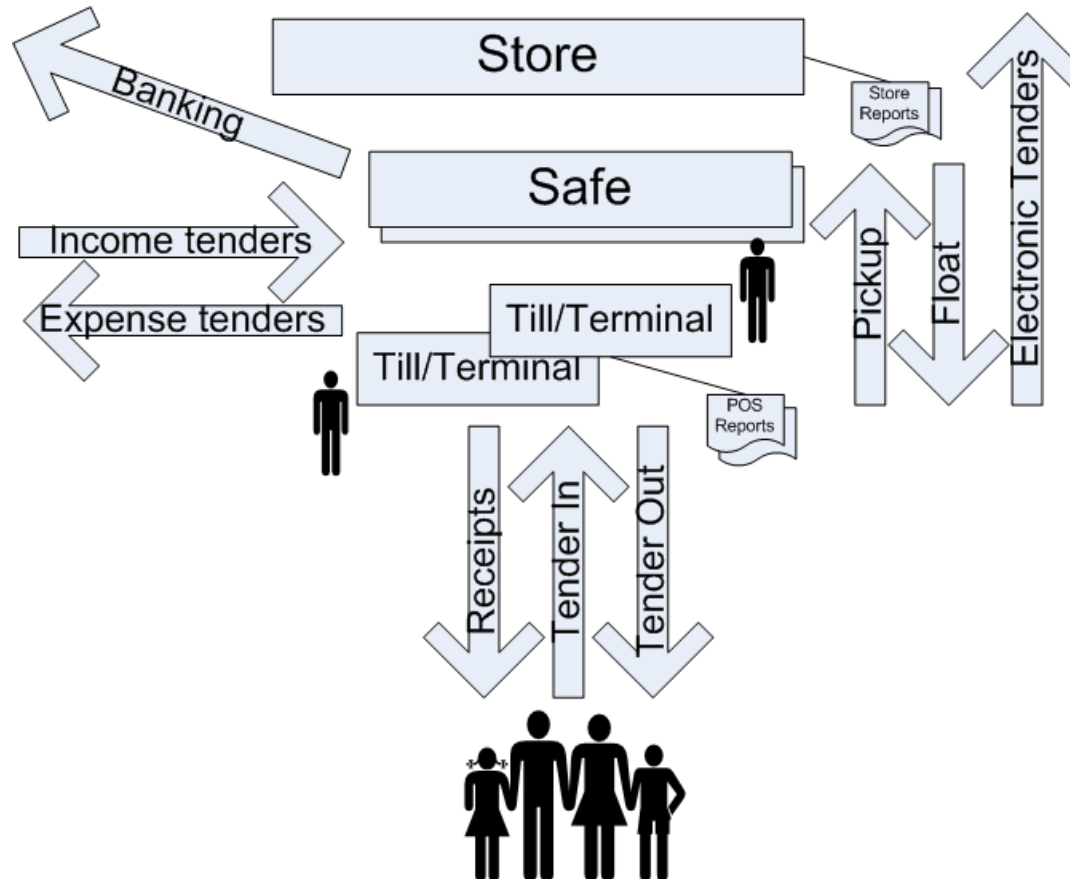
POS – Configurable Prompt Designer



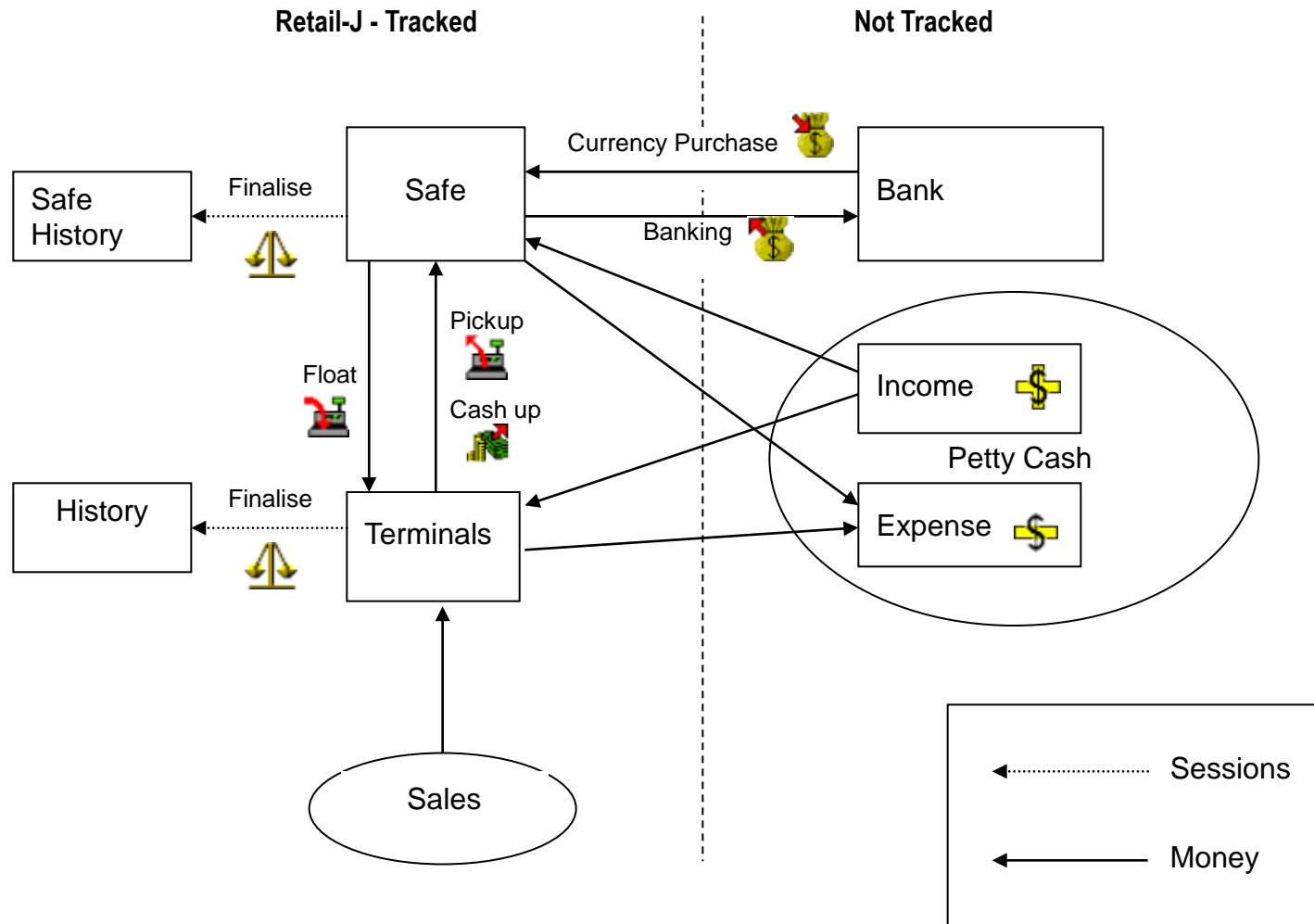
- Transaction flow triggered by sale of a base product
- Progresses through the accessories and services that can be purchased with the base product
- Maps the decisions and subsequent options in a transaction workflow
- The transaction workflow is messaged through the estate to nominated POS profiles

Cash Management

Tender Circulation



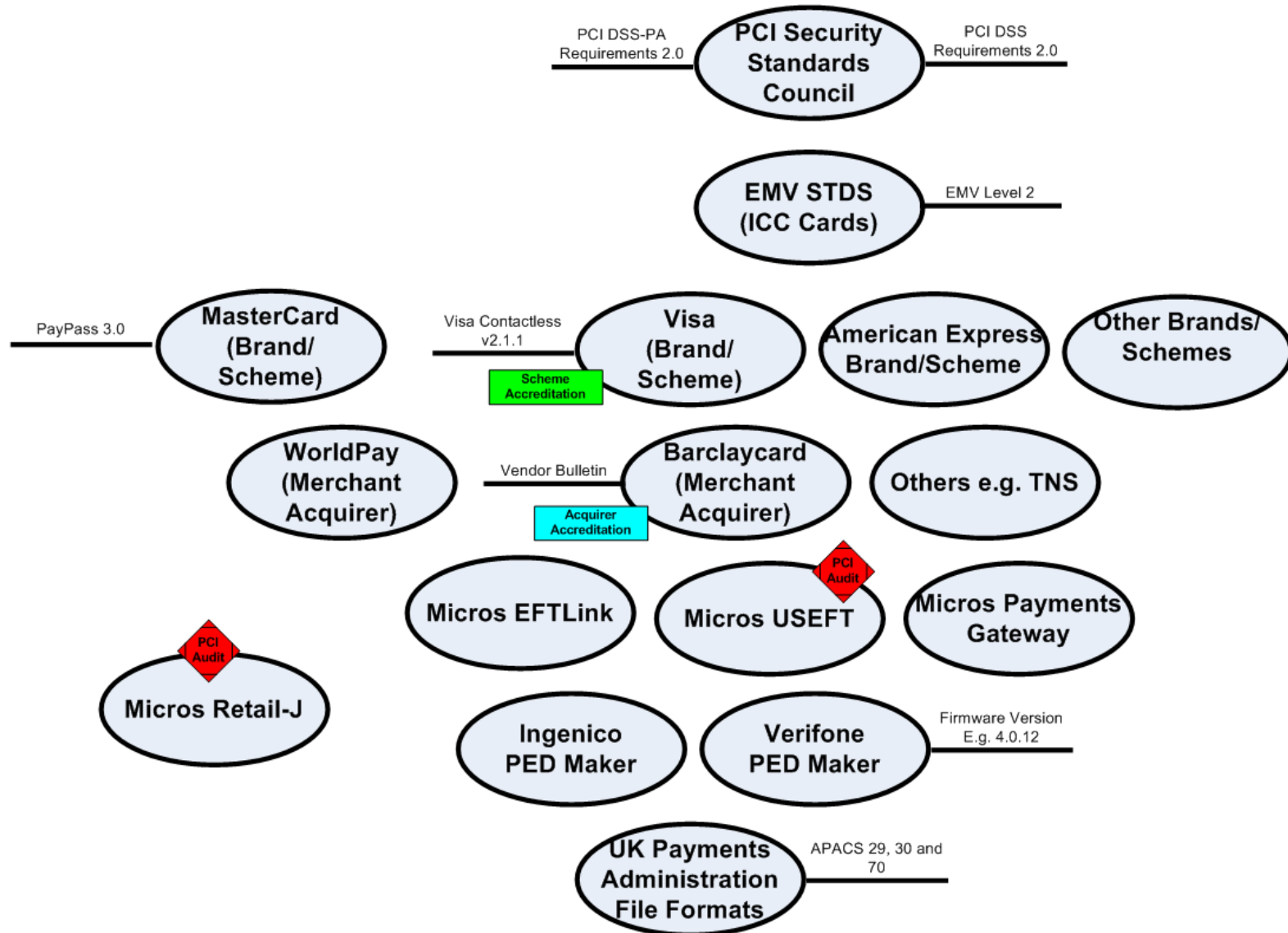
Cash Management Overview



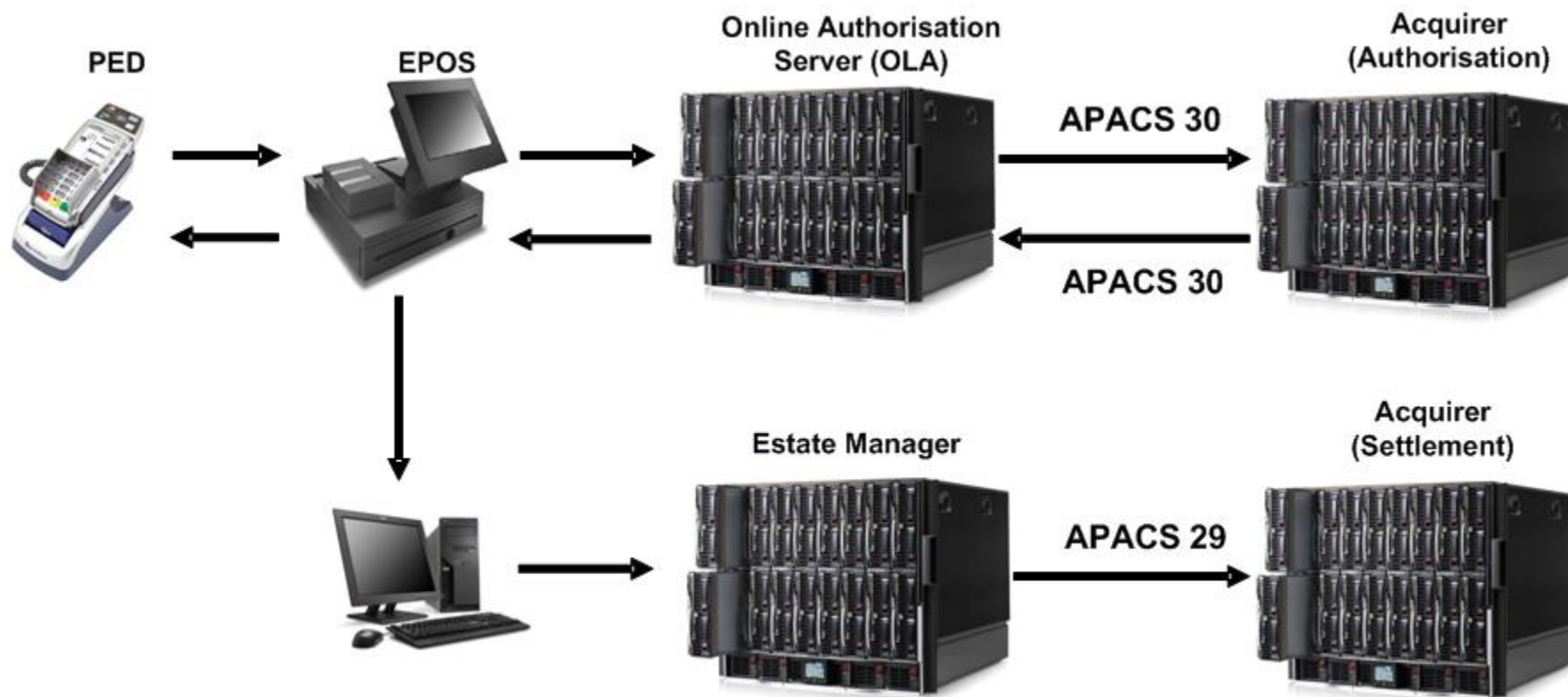
Card Payments

- Environment
 - Players, Standards, Accreditation and Certification
- Two-part model
 - Authorisation
 - Settlement
- Gift Cards, Rechargeable Vouchers, Loyalty Cards
- Ultra Secure EFT/Managed Service
- PayPal
- Multi-currency and Dynamic Currency Conversion

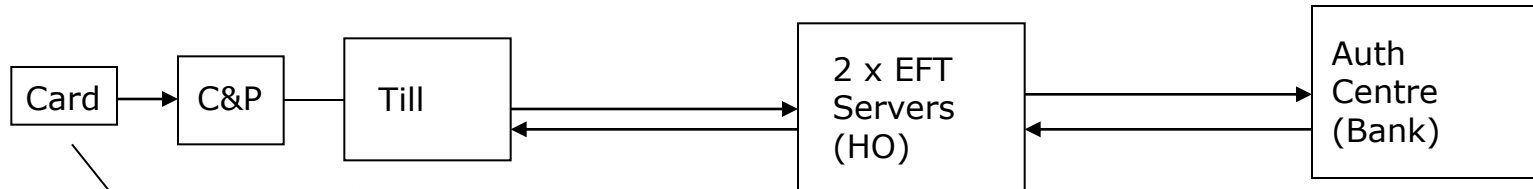
Card Payments – Environment



Authorisation and Settlement



Card Payments Authorisation



Either the chip on the card or the rules configured within Retail-J on the till can trigger a card to go for online Auth

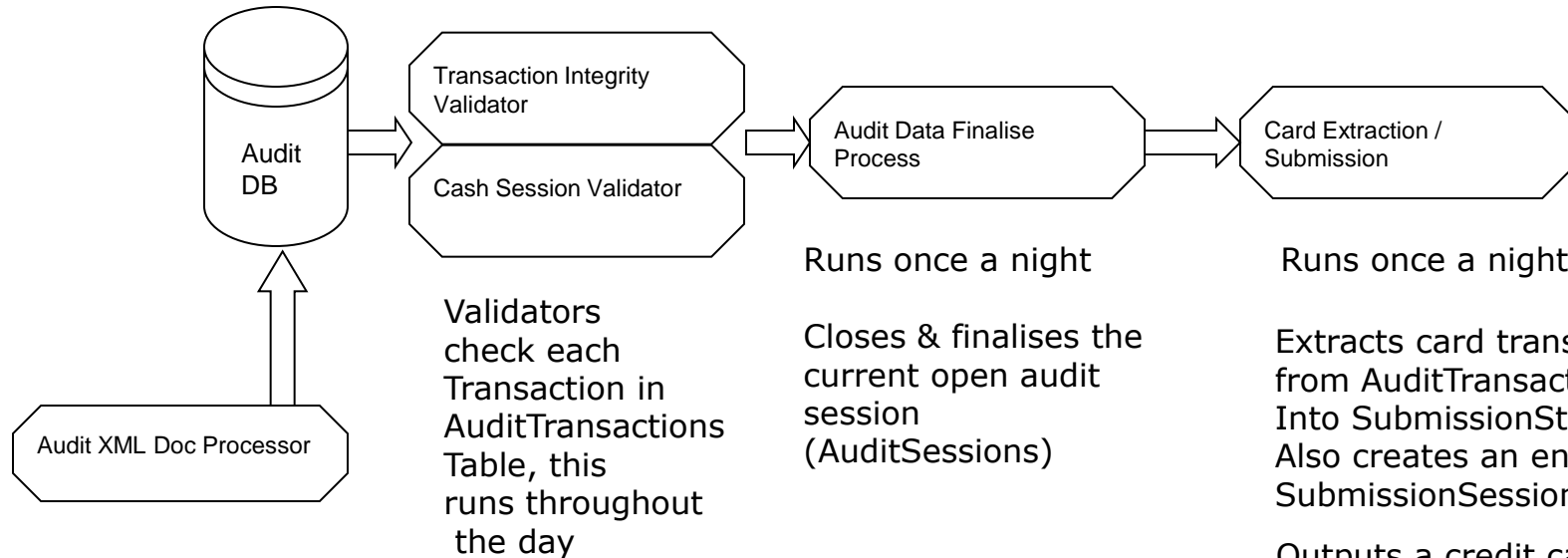
Till passes transaction details to EFT Server and requests an auth

EFT Server connects to bank and requests auth

Result of auth (Auth, Decline, Refer, Error) is sent back to the EFT server

EFT server passes result to till

Card Payments Submission



Runs once a night

Closes & finalises the current open audit session (AuditSessions)

Runs once a night

Extracts card transactions from AuditTransactions Into SubmissionStaging Also creates an entry in SubmissionSessions

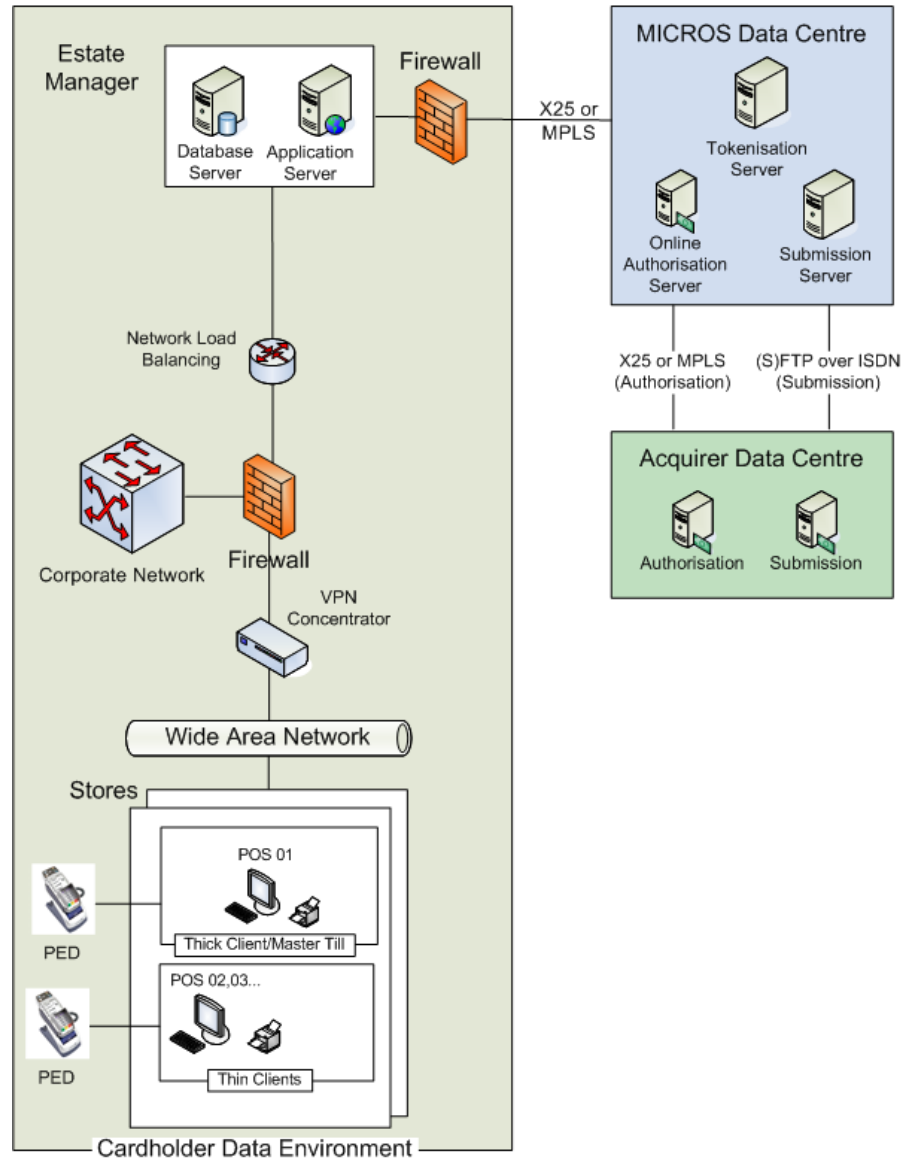
Outputs a credit card file based on SubmissionStaging to file system

Submits file to bank FTP over ISDN and marks SubmissionSession as submitted

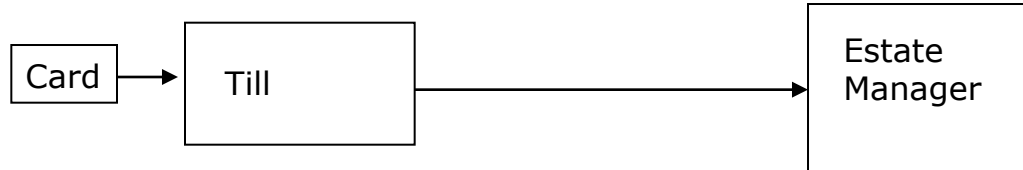
Submission date/time recorded in SubmissionHistory

As transactions arrive AuditXML Doc Proc writes transactions to Audit database (AuditTransactions)

Ultra Secure EFT



Electronic Gift Cards



Card swiped on till



Till makes direct connection to EM using HTTP Servlet and passes card number (+current user & device details)



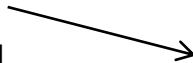
EM checks card is active and responds with current balance



Till allows tender of card (up to account balance)



As soon as tender is confirmed, till makes another direct connection to EM to confirm tender

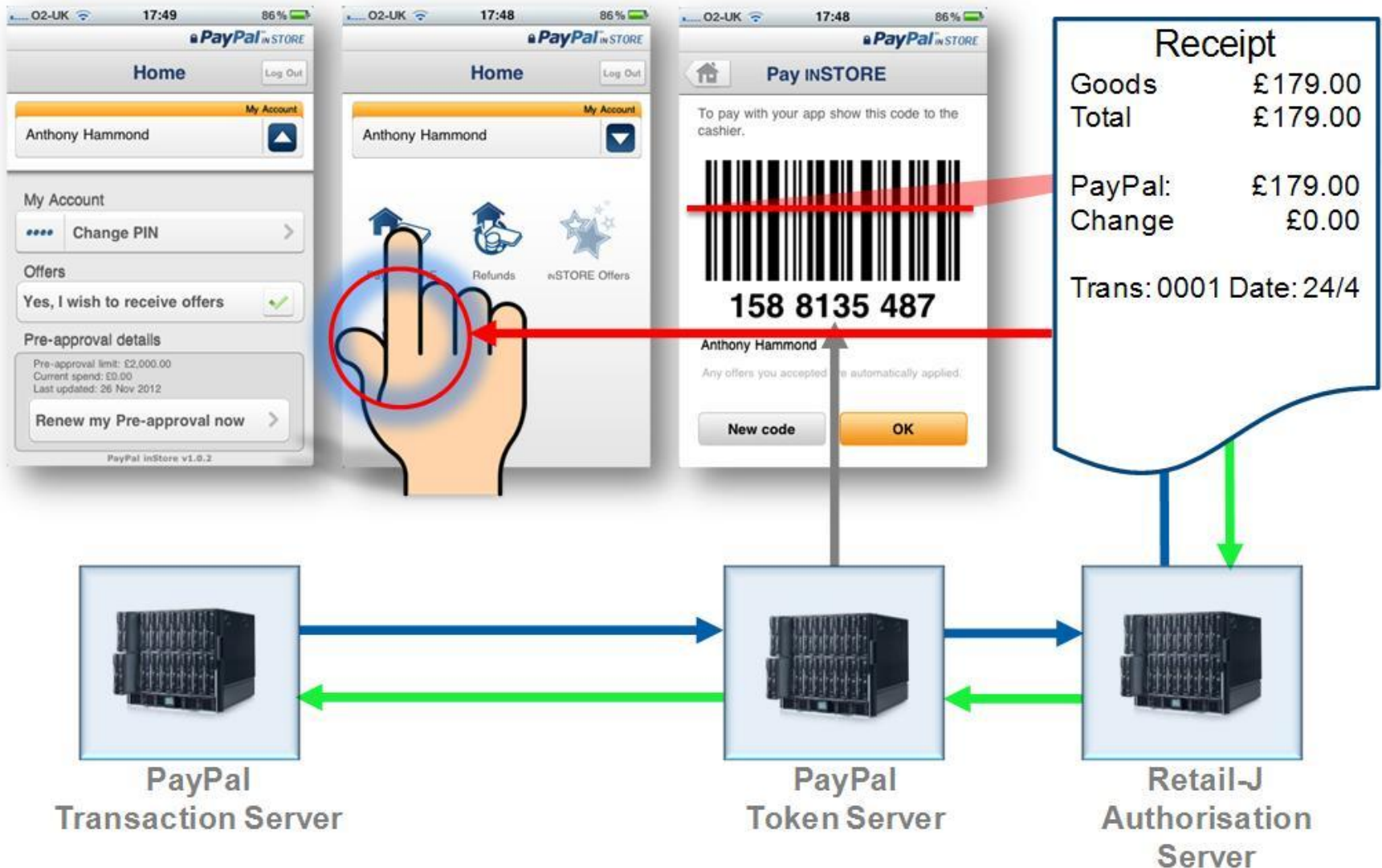


EM deducts tender from card balance And confirms update back to till

When sale reaches EM via normal messaging, the update to the card balance is checked to confirm it has been processed

Payments - PayPal

micros®



Inventory










Inventory Architecture

Browser

Product Inventory Requests

Product Inventory Requests allows you to request items from another stock holding location within your organisation..

Select a location: Type Name

Options	Request ID	Source Name	Status	Date Requested	Products Requested	Quantity Requested
  	PIR0018	AUT Store	New	21/11/06 10:45	2	7
  	PIR0017	AUT Store	New	21/11/06 10:44	2	4
  	PIR0016	UK Store	New	21/11/06 10:44	1	10

New Request →

Terminal

Printed: Java Money

Please enter the cash paid by the customer.

Single-breasted 2pce £149.00
BALANCE DUE £149.00

OK
£149.00
£150.00
£160.00
Cancel

Branch: 00096 Terminal: 0001 Transaction: 0504 Mike Carrell 04/04/02 14:23

Store Server

Web Server

XML Processing/
Forwarding

Database

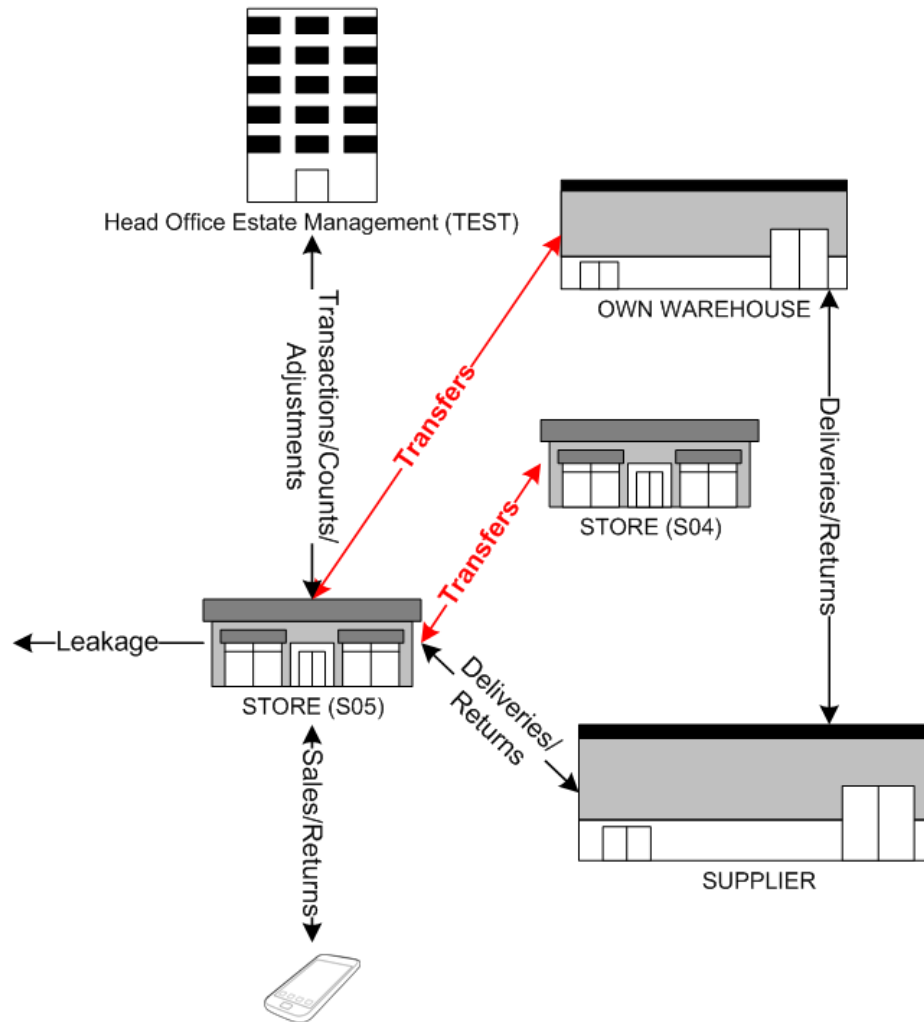
Estate Manager

XML Processing

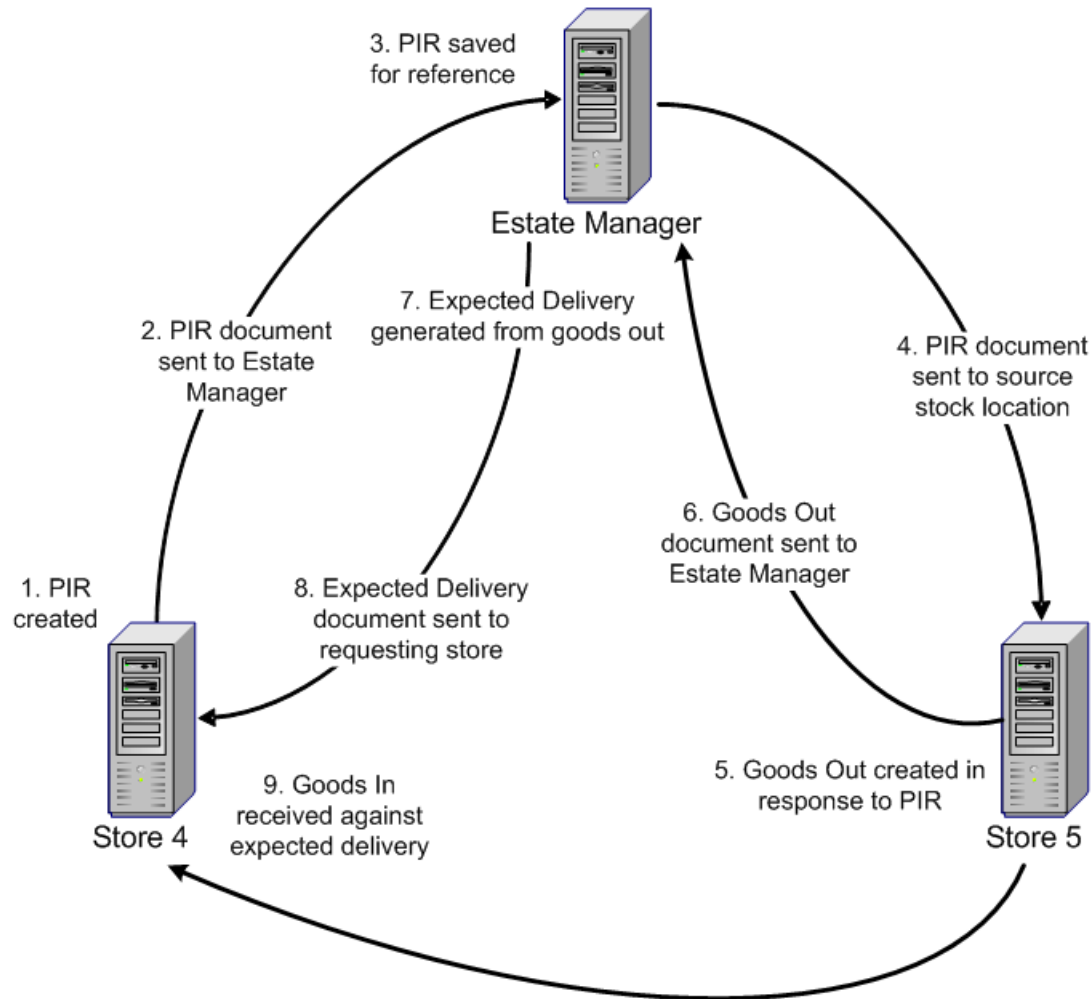
Database

Product Search	Inventory Reservation Request
Stock Enquiry	Product Inventory Allocations
Product Enquiry	Purchase Orders
Product Exporter	Stock Adjustments
Expected Deliveries	Mobile Counting Device
Goods In	Stock Counting
Goods Out	Replenishment Requests
Product Inventory Request	Inventory Reports

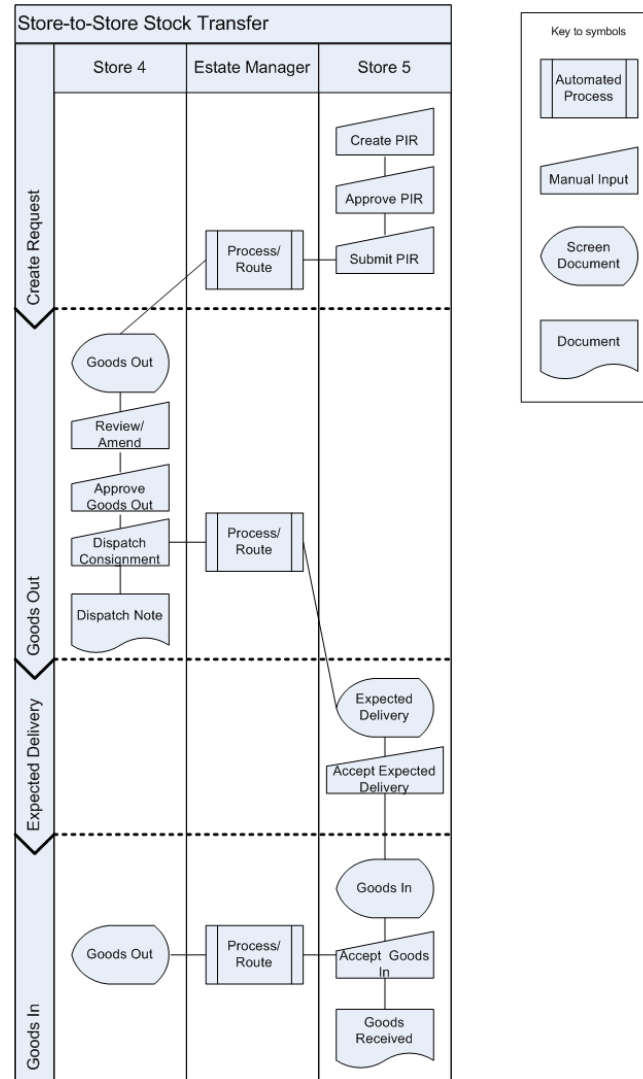
Inventory Flows



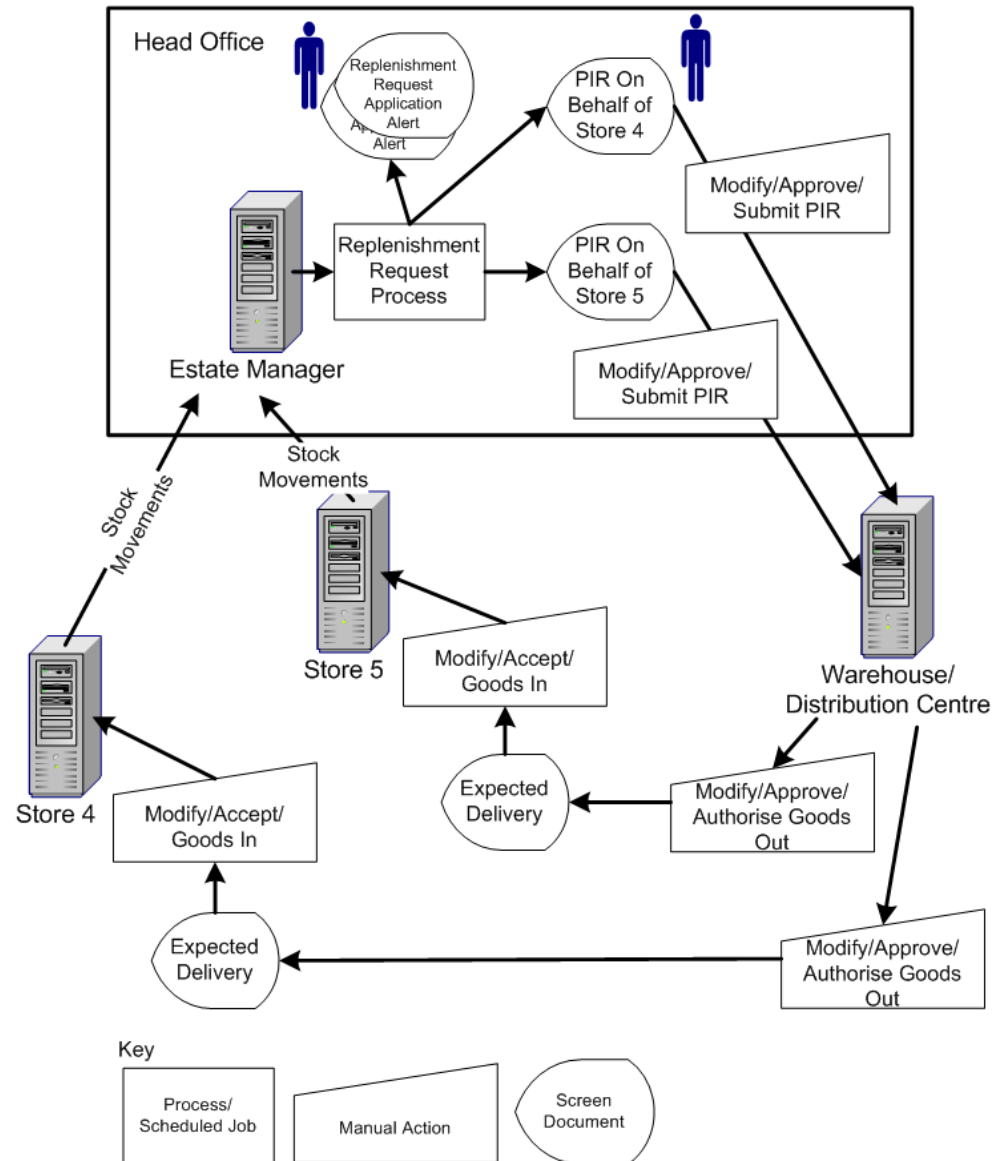
Product Inventory Request



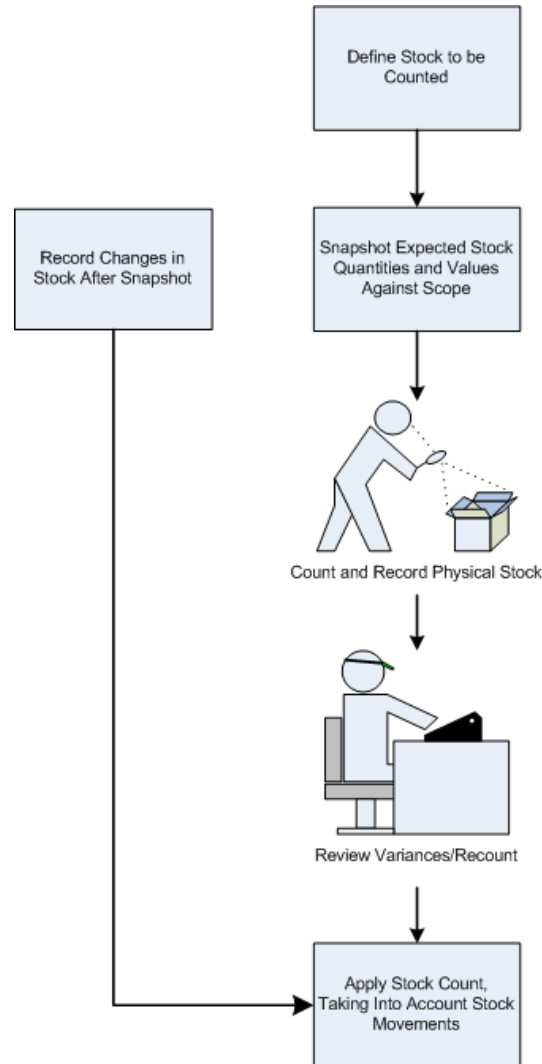
Inter Branch Transfers



Central Replenishment



Stock Count Process



Inventory Reconciliation

Units	Store 1 Product A	Store 2 Product A	Estate Manager Product A	
			Store 1	Store 2
'Opening Stock'	100	200	100	200
Sales	5	10	5	10
Count	90	195	90	195
Adjustment	-5	+5	-5	+5
'Closing Stock'	90	195	90	195

Interfaces

Types of Interface

