Oracle® Retail EFTLink

Framework Installation and Configuration Guide

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Oracle Retail EFTLink Framework Installation and Configuration Guide, Release 22.0

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Preface

The *Oracle Retail EFTLink Framework Installation and Configuration Guide* describes the requirements and procedures to install this Oracle Retail EFTLink release.

Audience

This Installation Guide is for the following audiences:

- System administrators and operations personnel
- Database administrators
- System analysts and programmers
- Integrators and implementation staff personnel

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Related Documents

For more information, see the following documents in the Oracle Retail EFTLink Release 22.0 documentation set:

- *Oracle Retail EFTLink Release Notes*
- *Oracle Retail EFTLink Core Configuration Guide*
- *Oracle Retail EFTLink Framework Advanced Features Guide*
- *Oracle Retail EFTLink Security Guide*
- *Oracle Retail EFTLink Rest API Guide*
- *Oracle Retail EFTLink Xstore Compatibility Guide*
- *Oracle Retail EFTLink Validated Partners Guide*
- *Oracle Retail EFTLink Validated OPI Partners Guide*

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Review Patch Documentation

When you install the application for the first time, you install either a base release (for example, 22.0) or a later patch release (for example, 22.0.x). If you are installing the base release, additional patch, and bundled hot fix releases, read the documentation for all releases that have occurred since the base release before you begin installation. Documentation for patch and bundled hot fix releases can contain critical information related to the base release, as well as information about code changes since the base release.

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1 Overview

This chapter provides an Installation Guide Overview a Product Overview, and an Architectural Overview.

Installation Guide Overview

Installation of EFTLink consists of the following steps:

1. Extract the EFTLink files from a zip - `eftlink_v22.0 zip` to a folder on your system.
2. Select one specific core to connect to the EFT system or terminal to be used. Separate batch and script files are provided to do this for each core from a command line for both Windows and Linux.
3. Install EFTLink as a service – a batch file is provided for Windows. For Linux either the EFTLink application can be called at start up or set up as a daemon.
4. Configure the specific core.

The *Oracle Retail EFTLink Framework Installation Guide* covers the installation and configuration of the framework for EFTLink. A companion volume, the *Oracle Retail EFTLink Core Configuration Guide*, details the specific settings required to configure each Core to communicate with a specific payment system.

Product Overview

There are multiple manufacturers of Point of Sale (POS) terminals on the market. There are also large numbers of manufacturers of card readers and PIN Entry Devices (PEDs). These card readers can accept a wide variety of cards including debit cards, credit cards, loyalty cards and fuel cards for motor vehicles. These cards are provided by a wide range of issuing organizations each with their own Electronic Payment Systems (EPS). Interconnecting the POS systems, card readers and EPSs is a complex task.

EFTLink is an efficient, platform independent way of providing the connection. It is written in Java, distributed as a Java library and readily added to the software of individual POS terminals.

EFTLink is a router and protocol converter that presents a standard interface to a payment client (typically for a POS) and links to any card readers or authorization systems in use at the retailer. The interface with the authorization system is therefore separate from the POS, removing any impact of country-specific or server-specific requirements from the POS itself.

EFTLink comes in two parts:

- The EFTLink Framework
- EFTLink Cores

The EFTLink Framework provides a system-independent execution environment (a framework) for a targeted EFT solution. The EFTLink Core for a specific terminal or payment system is implemented as a plug-in module that runs within that framework.

Oracle can provide cores for many of the most used card readers or PEDs. Cores can also readily be written for any other card readers or PEDs that require them. Once a core is available for a specific device it will normally work on a range of POSs without further modification.

The POS/EFTLink interface conforms to the Open Payment Initiative (OPI). This is an open standard, widely used in the retail industry. Over time, the original OPI specification has been adopted, extended and maintained by the International Forecourt Standards Forum (IFSF). This enhanced IFSF POS-EPS version is now taken as the definitive specification.

EFTLink is not a full implementation of the IFSF POS-EPS specification. Instead, it uses those parts of the base specification that are pertinent to the sales of dry goods in the retail sector and to the sale of wet goods in petrol (gas) stations. EFTLink includes all the main messages from the IFSF POS-EPS specification and those messages contain all mandatory elements and attributes. EFTLink also includes optional elements and attributes that are commonly used by retailers.

EFTLink can also be extended beyond the IFSF POS-EPS specification. This allows additional features to be included to deal with extended payment or loyalty requirements being driven by new initiatives in retail. This gives considerable flexibility in dealing with the evolving requirements of the future.

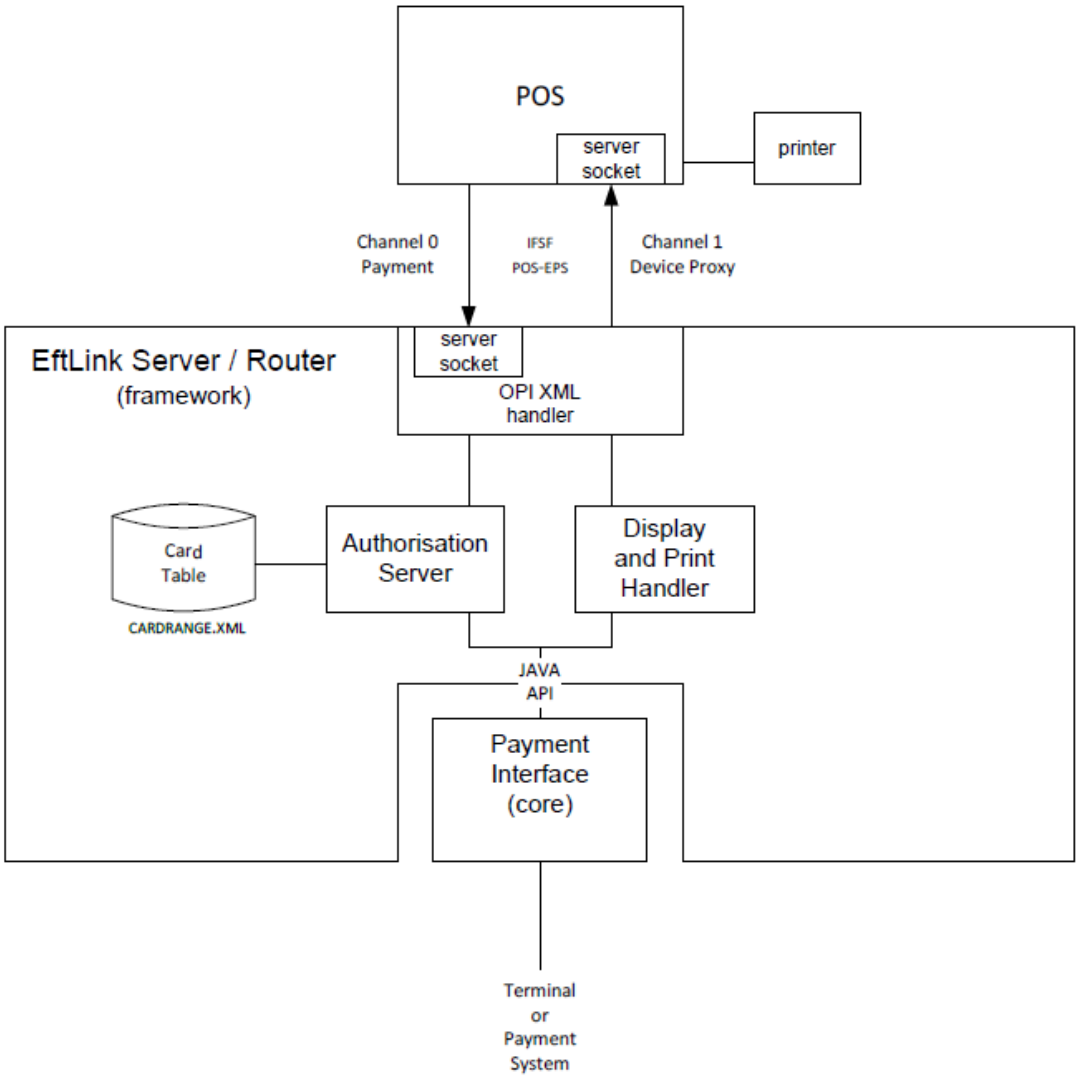
Examples of where EFTLink is used include:

- Payment, Refund, Reversal, Pre-authorization and Completion.
- Loyalty Award and Redemption, Balance inquiry, Discount voucher/coupon, IOUs.
- Stored Value Cards – Load, Redeem, Balance inquiry, Activate and so on.
- Online Agents – E-top-up and utilities payments.
- Tokenization, Gratuity, Cashback, DCC, Ad-hoc card read.
- Combined Payment and POS receipts.
- Maintenance functions.
- EPS/PED pooling.

Architectural Overview

EFTLink is a router and protocol converter, presenting an IFSF/OPI interface to a payment client (typically a POS), and linking to whatever authorization system (or systems) the customer uses. The adoption of a standard IFSF/OPI interface makes EFTLink portable to other POS or payment environments. EFTLink is not in itself a complete solution. What it provides is a system-independent execution environment (a framework) for a targeted EFT solution. The core implementation for a specific terminal or payment system is implemented as a plug-in module that runs within that framework.

Figure 1-1 Oracle EFTLink OPI Server/Router



Miscellaneous Data Disclaimer

EFTLink along with some selected Cores, has the ability for additional data to be sent and received in a field called `<MiscellaneousData>`.

This can be used by System Implementers (SIs) and Payment Service Providers (PSPs) to pass additional data in the messages between Xstore and the Payment Providers, using custom code.

Typically, this is used to add directives which we can trigger different payment workflows. However, it can also be used to capture additional payment data for downstream processing for the Retailer's to use for reconciliation or financial purposes.

Under no circumstances should any PCI or potentially sensitive PII data be placed in this field. Oracle will not be responsible for any issues caused by integration changes made by SIs, Retailers and Payment Providers, that enable sensitive data to be added into this field.

2
Installation

This chapter describes the installation of EFTLink and covers the following topics:

Skillset Required

To install EFTLink successfully system implementers must:

- Understand the requirements of the specific EFT system being used, and the POS software that will be connecting to EFTLink.
- Understand the configuration settings held in property files which control how EFTLink, and the selected core behave. System implementers must know how to add or modify properties within property files with their chosen text editor.
  - Java properties are case sensitive, and never contain spaces in the property name. They usually do not contain spaces in the property value – there are sometimes exceptions in lists.
  - A space is allowed before and after the = that separates the property from its value.
  - Case sensitivity does not apply to Boolean values – True is the same as true.
  - Each property = value is a separate line.
  - Lines prefixed with # are comments.

Prerequisites

EFTLink can be installed on Windows or Linux operating systems, but the procedure will differ accordingly.

> **Note:**
>
> Oracle Retail assumes that the retailer has ensured its Operating System has been patched with all applicable Windows updates.

POS System Requirements

The POS system should meet the following minimum requirements.

- 256MB RAM
- Intel Celeron 1GHz or equivalent CPU

- 1GB disk space.

Supported Operating Systems

EFTLink is supported on the following Operating Systems:

- Oracle Enterprise Linux 7
- Windows POSReady 7
- Windows 7
- Windows 10
- Windows 10 IOT Enterprise LTSB 2016 (1607)

Java

EFTLink framework will run with any version of Java from 1. 8. All strategic cores except for the PayByLink core are binary compatible to Java 1.7 whereas the PayByLink core requires Java 1.11.

EFTLink by default expects Java JRE to exist in the folder location C:\jre (*on Windows*) or /opt/jre (*on a Linux kernel*).

To change the default location of java you will need to update either `include-eftlink-windows.conf` or *include-eftlink-linux.conf* which are located in `<installation directory>\wrapper\conf`.

This may be required in situations where a specific version of JRE is required, such as where a different version of the JRE is required to that which is being used by the POS, which may also be using the location c:\jre. See the *Oracle Retail EFTLink Core Configuration Guide* for any core JRE requirements.

Installing EFTLink

Runnable Installer/Upgrader Jar

> **Note:**
>
> This section describes how to install EFTLink using the installer jar.
>
> Follow the steps below to install EFTLink.

The `eftlink-22.x-installer.jar` and `eftlink-22.x-upgrader.jar` are runnable and if executed will perform a silent installation/upgrade by default.

To perform a silent installation requires a pre-populated `ant.install.properties` file to exist within the same directory as the runnable jars.

Property Settings

Lists each mandatory setting for the `ant.install.properties` file.

Table 2-1 Mandatory Installer Settings

Setting	Description	Example
installDir	Installs EFTLink to the directory specified. Note: When upgrading EFTLink the installDir property setting must point to the existing directory where EFTLink is installed.	`C\:\\eftlink`
eftlinkChannelZeroPortNumber	Configures EFTLink eftlinkConfig.properties ServerChannel0 property setting. Note: This setting is not applicable when running the `eftlink-22.x-upgrader.jar`.	`10100`
eftlinkChannelOnePortNumber	Configures EFTLink eftlinkConfig.properties ServerChannel1 property setting. Note: This setting is not applicable when running the `eftlink-22.x-upgrader.jar`.	`10101`
selectedCore	EFTLink will install and automatically configure itself to use the class path entered here. Note: This setting is not applicable when running the `eftlink-22.x-upgrader.jar`.	`manito.eft.tenderretail.TenderRetailCore`

Performing an Install/Upgrade

1. Unzip the `vxx.x.x.xxx.installer.zip` file somewhere other than the desired target directory which is typically `C:\eftlink` or `/opt/eftlink` for Linux.
2. Make sure that Java is on the path of the system. In Linux, JAVA_HOME is also required to be set.
3. Navigate to the path where you extracted the installer zip file.

   For example, `C:\<user>\Downloads` or `~/Downloads`).
4. Review the supplied `ant.install.properties` file and make changes if necessary. For example, if performing an upgrade then ensure the installDir property setting points to the existing directory where EFTLink is currently installed.
5. Open a terminal (using elevated privilege) ensuring the directory is set to where the install/upgrader jars are located.

   Running the installer:

   a. Command to launch the installer.

*(Windows) `eftlink-(xx.x.x.x)-installer.jar` or

(Linux) `sudo . eftlink-(xx.x.x.x)-installer.jar`

* if preferred the installer jar has a graphical user interface which can be accessed during installation by adding "gui" to the end of the command statement (separated by a space). For example `eftlink-(xx.x.x.x)-installer.jar gui`.

b. The installation will end with the OPI Service being installed.

c. Within the EFTLink installation directory, copy from `C:\<eftlink installation folder>\keys` folder the pos.private.jks and eftlink.public.jks files to the POS (for example, `C:\xstoredata\xstore\keys`, or prior to version 22 of Xstore in `C:\xstore\keys`).

Running the upgrader:

a. Command to launch the upgrader.

*(Windows) `eftlink-(xx.x.x.x)-upgrader.jar` or

(Linux) `sudo . eftlink-(xx.x.x.x)-upgrader.jar`

b. Once the upgrade is complete your eftlink installation directory should be updated but all configuration properties settings should have been retained.

6. Close the terminal and remove installations files / backup files if necessary.

7. Start EFTLink. In the terminal, navigate to the installation directory, for example, `C:\eftlink` or `/opt/eftlink`.

*Windows: `start eftlink.bat`

Linux: `./eftlink.sh start`

*In Windows, you can also start the **OPI Server** in the services panel.

Manual Installation

This section describes the installation sequence of EFTLink using the binary files.

- Step 1 - Creating the EFTLink Folder
- Step 2 - Install the Files
- Step 3 - Run the Installation Script
- Step 4 - Copy TLS Communication Keys

Step 1 - Creating the EFTLink Folder

A folder should be created or designated for the EFTLink package. This folder can be any name and location, the only restriction is that there should be no spaces in the path. Conventionally you may wish to use the name `eftlink`.

Step 2 - Install the Files

EFTLink is supplied as a zip file, which, should be unzipped into the designated folder. All files needed, including the entire set of core files are included.

Once unzipped, the following files and folders should be present in the designated EFTLink folder:

Table 2-2 List of Unzipped Files and Folders

Files/Folder	Comment
apidocs	Folder containing the API documentation for the framework.
cores	Each core sub-directory contains the core jar file, and reference copies of that core's property file(s).
lib	The lib folder contains supporting files for EFTLink.
linux	Folder containing files for tanuki wrapper.
linux_64	Folder containing files for tanuki wrapper.
log	Folder containing the log files.
tmp	Working folder for EFTLink.
windows	
windows 64	
wrapper	
CardRange.xml	The default tender mapping and card identification file.
CreateKeys.bat	A batch file used to create encryption keys to ensure secure communications between POS and EFTLink.
CreateKeys.sh	A Linux script used to create encryption keys to ensure secure communications between POS and EFTLink.
eftlink.bat	A batch file used to launch the eftlink application.
eftlink.sh	A Linux script used to launch the eftlink application.
eftlink.jar	The main executable code of the EFTLink framework.
EftLinkConfig.properties	Carries the settings for the framework.
EftlinkConfig_PED_Pool.properties	Carries the framework settings for use with PED pooling mode.
EftlinkConfig_Static_Server.properties	
EftlinkXstore_Mobile.properties	
Eftlink-rest-api.bat	A batch file used to launch the rest API application.
Eftlink-rest-api.jar	Executable code of the rest API application.
Eftlink-rest-api.properties	
Eftlink-rest-api.sh	A Linux shell script used to launch the rest API application.
Eftlink-rest-api-log4j2.xml	Log4j2 configuration file.
installcore.bat	A windows batch file script which sets one of cores (contained within the cores folder) as active.
installcore.sh	A Linux shell script which sets one of cores (contained within the cores folder) as active.
Jetty.xml	
LangCN.properties	Language files.
LangDE.properties	

Table 2-2 (Cont.) List of Unzipped Files and Folders

Files/Folder	Comment
LangEN.properties	
LangES.properties	
LangFR.properties	
LangIT.properties	
LangJP.properties	
LangNL.properties	
LangPT.properties	
LangRU.properties	
LangSV.properties	
Log4j2.xml	Log4j2 configuration file.

Step 3 - Run the Installation Script

To setup EFTLink with an active core:

Table 2-3

Core Name (Case insensitive)	Description
Adyen	Adyen
Cayan	Cayan
FIPay	AJB FIPay
OciusSentinel	Verifone Ocius Sentinel
OPIRetail	OPIRetail
PayByLink	PayByLink (as secondary core only)
PayPal	PayPal (supports Ewallet transactions only)
PointUS	Verifone Point (US)
SixPay	Six Payment Services MPD
SolveConnect	The Logic Group SolveConnect
TenderRetail	TenderRetail
WorldPay	WorldPay

For **Windows**,

- From the run line type:`<installation directory\installcore.bat` (Advanced setup)
- From a command terminal:`<installation directory\installcore.bat <CoreName>` (Legacy setup)

For **Linux**,

open a terminal and change the directory to the EFTLink installation path and type: `installcore.sh <coreName>`

Follow the on-screen instructions. The batch or script file does two things:

- Configures EftlinkConfig.properties with the desired core(s).
- Copies the selected core property file from the specific core folder to the main EFTLink folder, where it will be the active file.
- Installs EFTLink as a Windows Service.
- Creates TLS Communication Keys.

The table below lists the full classpath to the supplied core application.

Table 2-4 Core Classpath

Core	Classpath
Adyen	manito.eft.adyen.AdyenCore
AJB FIPay	manito.eft.ajb.FIPayCore
Cayan	manito.eft.cayan.CayanCore
OPI Retail	oracle.eftlink.opiretail.OPIRetailCore
PayPal	oracle.eftlink.paypal.PayPalCore
Six Payment Services MPD	manito.eft.sixpay.SixpayMPDOPIClient
Tender Retail	manito.eft.tenderretail.TenderRetailCore
The Logic Group SolveConnect	manito.eft.solveconnect.SolveConnectCore
Verifone Ocius Sentinel	manito.eft.ocius_sentinel.OciusSentinelCore
Verifone Point US	manito.eft.pointus.PointUSCore
WorldPay	manito.eft.worldpay.WorldPayCore

Step 4 - Copy TLS Communication Keys

Within the EFTLink installation directory, copy from C:\<eftlink installation folder>\keys folder the * pos.private.jks and eftlink.public.jks files to the POS (for example C:\xstore\keys).

Post Installation Steps

By default, in Windows, the 'OPI Server' service is using the Local system account user. In order to ensure for EFTLink service to create dynamic key store files, a user with an administrative privilege is needed. This is only applicable for cores like PointUS and Cayan. In the services panel, right click on the OPI Server service. Select the **Properties** option. Select the **Log on** tab. Select **This account:**Input the user's credentials and select **OK**.

- Adyen: The POS_JNI jar which is provided by Adyen is also required. This needs to be copied to `C:\eftlink\cores\Adyen` or `/opt/eftlink/cores/Adyen` for Linux. Refer to the **Third Party** section of the Adyen core in the *Oracle Retail EFTLink Core Configuration Guide* located on OHC for more details.
- AJB FiPay: The `AJBComm.jar` component needs to be copied to `C:\eftlink\cores\FIPay` or `/opt/eftlink/cores/FIPay` for Linux. Refer to the **FileSet** section of the AJB core in the *Oracle Retail EFTLink Core Configuration Guide* located on OHC for more details.

- Cayan: The merchant credentials which are supplied by Cayan team are needed to be setup. This can be done in Xstore's back office through the EFTLink Admin functions. Refer to the **Account Information Entry** section of the Cayan core in the *Oracle Retail EFTLink Core Configuration Guide* located on OHC for more details.
- VerifoneUS: The PED needs to be paired with EFTLink prior to use. This can be done through Xstore's back office in the EFTLink Admin functions. Refer to the **Administration Functions** section of PointUS core in the *Oracle Retail EFTLink Core Configuration Guide* located on OHC for more details.

Altering the Windows Service

By default, EFTLink is install as a window service (OPI Server). Below commands can be run post * installation to either alter the services state or remove it altogether.

Windows Configuration

To stop, check the status or to restart EFTLink from a terminal, type one of the following commands:

- `eftlink.bat console` - run the application with a console
- `eftlink.bat start` - start eftlink once installed as a Windows service
- `eftlink.bat restart` - restart eftlink once installed as a Windows service
- `eftlink.bat stop` - stop eftlink once installed as a Windows service
- `eftlink.bat install` - install eftlink as a Windows service
- `eftlink.bat remove` - uninstall eftlink as a Windows service
- `eftlink.bat help` - show this message

Linux

`sudo./eftlink.sh stop` - stop eftlink service

`sudo./eftlink.sh status` - service status

`sudo./eftlink.sh restart` - restart service

`sudo./eftlink.sh condrestart` - only starts the daemon if it is currently running

Securing Communication by Creating TLS Communication Keys

Although TLS communication Keys are generated by default. You may wish to regenerate your keys. A batch file, CreateKeys.bat, and a Linux script, CreateKeys.sh is included in the EFTLink project to facilitate creation of encryption keys.

1. Locate the `CreateKeys.bat / CreateKeys.sh` file in the EFTLink folder

   .

2. From a terminal, run the CreateKeys script file with an appropriate set of parameters to create encryption keys.

   ```
   CreateKeys.bat    -e <algorithm> <bitlength> <signAlgorithm>
   <daysValidity> [-dname]
   ```

```
CreateKeys.sh    -e <algorithm> <bitlength> <signAlgorithm> <daysValidity> [-dname]
```

For example, `CreateKeys.bat-e RSA 4096 SHA256withRSA 750`

For example, `CreateKeys.bat-e RSA 4096 SHA256withRSA 750 –dname`

Table 2-5 SelfSigned Certificate Parameters

Switch	Parameter	Description	Supported Value
-e	<algorithm>	Algorithm used for TLS keys encryption.	EC,DSA,RSA
	<bitlength>	Number of bits - higher values equate to a higher level of encryption.	256 (when using EC), 1024,2048 (when using DSA), 1024,2048,3072,4096,7680,8192,15360 (when using RSA)
	<signAlgorithm>	Signature Algorithm used.	SHA256withECDSA, SHA384withECDSA, SHA512withECDSA (when using EC), SHA256withDSA (when using DSA), SHA256withRSA, SHA384withRSA, SHA512withRSA (when using RSA)
	<daysValidity>	Number of days after creation that the certificate will remain valid.	100 to 750 days
	[-dname]	Prompt for POS and Eftlink keystores certificate Distinguished Name information.	

3. Once encryption keys are created, five files will be present on the system in the keys subfolder of EFTLink:

   `pos.private.jks` to be MOVED to the POS client

   `pos.public.jks` - to remain on the EFTLink Server

   `eftlink.private.jks` - to remain on the EFTLink Server

   `eftlink.public.jks` - to be MOVED to the POS client

   `comms.keystore.properties` - required to be held on both POS and EFTLink Server

4. The following files should be REMOVED from the EFTLink system and placed on the POS in the folder [xstore root]\keys, where xstore root is the main POS client folder. For example, `C:\xstoredata\xstore\keys`, or prior to version 22 of Xstore in `C:\xstore\keys)`.

   `pos.private.jks`

   `eftlink.public.jks`

5. The following file should be COPIED from the EFTLink system and placed on the POS in the folder [xstore root]\keys, where xstore root is the main POS client folder. For example, `C:\xstoredata\xstore\keys`, or prior to version 22 of Xstore in `C:\xstore\keys)`:

   `comms.keystore.properties`

6. This will leave the following three files on the EFTLink server in the folder [eftlink root] \keys:

```
eftlink.private.jks

pos.public.jks

comms.keystore.properties
```

7. The removal of the appropriate files from the EFTLink server is to limit the availability of TLS keys only to where they are required, and in order to reduce the possibility of the keys being obtained and used to monitor traffic between POS and EFTLink server.

   These instructions are repeated by the CreateKeys script file when keys are generated.

> **Note:**
>
> From V20 onwards, expiry of TLS certificates is enforced by default. Self-signed certificates will be valid for a maximum of 750 days.

8. Clear warnings will be placed in log files when certificates are due to expire. Expired certificates will not result in loss of communication between POS and EFTLink.

CA Certificates

Optionally, the EFTLink application TLS encryption keys for secure communication between POS client and EFTLink server may be signed by a CA. A batch file, CreateKeys.bat, and a Linux script, CreateKeys.sh is included in the EFTLink project to facilitate creation of encryption keys, generation of signing request and import of the signed certificates.

1. Locate the `CreateKeys.bat / CreateKeys.sh` file in the EFTLink folder.
2. From a terminal, run the CreateKeys script file with an appropriate set of parameters to create encryption keys. The parameters are like those when used to generate self-signed certificates but specify the first parameter as -s.

```
CreateKeys.bat    -s <algorithm> <bitlength> <signAlgorithm>
<daysValidity> [-dname]

CreateKeys.sh    -s <algorithm> <bitlength> <signAlgorithm> <daysValidity> [-
dname]
```

   For example,

```
CreateKeys.bat-s RSA 4096 SHA256withRSA 750

CreateKeys.bat-s RSA 4096 SHA256withRSA 750 -dname
```

Table 2-6 CA Certificate Parameters

Switch	Parameter	Description	Supported Value
-s	<algorithm>	Algorithm used for TLS keys encryption.	EC,DSA,RSA

Table 2-6 (Cont.) CA Certificate Parameters

Switch	Parameter	Description	Supported Value
	<bitlength>	Number of bits - higher values equate to a higher level of encryption.	256 (when using EC), 1024,2048 (when using DSA), 1024,2048,3072,4096,7680,8192,15360 (when using RSA)
	<signAlgorithm>	Signature Algorithm used.	SHA256withECDSA, SHA384withECDSA, SHA512withECDSA (when using EC), SHA256withDSA (when using DSA), SHA256withRSA, SHA384withRSA, SHA512withRSA (when using RSA)
	<daysValidity>	Number of days after creation that the certificate will remain valid.	100 to 750 days
	[-dname]	Prompt for POS and Eftlink keystores certificate Distinguished Name information.	

3. Once encryption keys are created, a sub-folder based on the current date/time is created containing the encryption keys along with signing requests:

   For example,

   Folder name: keys20200710115046

   `Eftlink.private.jks` - selfsigned file

   `Pos.private.jks` - selfsigned file

   `Eftlink.private.csr` - certificate signing request

   `Pos.private.csr` - certificate signing request

   `Eftlink.private.jks` - backup of selfsigned file

   `Pos.private.jks` - backup of selfsigned file

   `comms.keystore.properties` - keystore encryption data file

   The backup files are required for the situation where a subsequent import is attempted but does not give the required results - further attempts may be made at importing the signed certificates received from the CA.

   For this reason, do not remove the backup files.

   File are held in this temporary folder rather than the keys folder as the signing process may take some time, and several sets of signed keys can be handled.

4. Deliver to your CA the following files:

   `Eftlink.private.csr`

   `Pos.private.csr`

   In reply, you should receive the following files (filenames may vary):

`Eftlink.private.cer.der` - signing of EFTLink.private.csr

`Pos.private.cer.der` - signing of POS.private.csr

`Root.cer` - root certificate used to sign

`Optional Intermediate.cer` - one or more intermediate certificates

5. Import the signed certificates into the keystores, by placing the signed files and root certificate (plus optional intermediate certificates) in the temporary signing keys folder keys[date] then running the following command.

```
Createkeys -I <foldername> <root cert> <eftlink signed file> <pos
signed file> <(optional) intermediate certificate 1><(optional)
intermediate certificate 2>
```

Table 2-7 Signed Files, Root Certificates and Intermediate Certificates

Switch	Parameter	Description	Supported
-e	<foldername>	Temporary keys Subfolder name. Do not provide the full path, just the foldername.	18 character folder name
	<root cert>	The root certificate provided by the CA	Security certificate
	<eftlink signed file>	Signed file returned by CA	Security certificate
	<pos signed file>	Signed file returned by CA	Security certificate
	<intermediate certificate 1>	CA Intermediate certificate	Optional Security certificate
	<intermediate certificate 2>	CA Intermediate certificate	Optional Security certificate

For example, `createkeys -i keys20200101010101 ca_root.cer eftlink.private.der.cer pos.private.der.cer ca_intermediate1.cer ca_intermediate2.cer`

6. Archive the temporary keys[date] folder to a safe location as this contains sensitive information.

7. The following files should be REMOVED from the EFTLink system and placed on the POS in the folder [xstore root]\keys, where xstore root is the main POS client folder. For example, `C:\xstoredata\xstore\keys`, or prior to version 22 of Xstore in `C:\xstore\keys`):

   `pos.private.jks`

   `eftlink.public.jks`

8. The following file should be COPIED from the EFTLink system and placed on the POS in the folder [xstore root]\keys, where xstore root is the main POS client folder. For example, `C:\xstoredata\xstore\keys`, or prior to version 22 of Xstore in `C:\xstore\keys`):

   `comms.keystore.properties`

9. This will leave the following three files on the EFTLink server in the folder [eftlink root]\keys:

   `eftlink.private.jks`

```
pos.public.jks

comms.keystore.properties
```

10. The removal of the appropriate files from the EFTLink server is to limit the availability of TLS keys only to where they are required, and to reduce the possibility of the keys being obtained and used to monitor traffic between POS and EFTLink server. These instructions are repeated by the CreateKeys script file when keys are generated.

> **Note:**
>
> From version 20 onwards, expiry of TLS certificates is enforced by default. Self-signed certificates will be valid for a maximum of 750 days.

11. Clear warnings will be placed in log files when certificates are due to expire. Expired certificates will not result in loss of communication between POS and EFTLink.

Deploying EFTLink within a Docker Container

Prerequisites

This docker file uses an Oracle Linux OS which is held at https://container-registry.oracle.com/

Create the Docker Image

1. Obtain the EFTlink installation file.
2. Extract the container.zip.
3. Copy the v22.0.0.<nnn>.zip to the extracted container folder.
4. Copy in a jre.zip file (You can use the xstore JRE utility provided in the OracleRetailXstoreCommon_<version>_XST_0_0_0.zip) to the container folder.
5. Either copy the container folder to your docker environment or ensure it is accessible.
6. Within you docker environment change the working directory to the container folder.
7. Type:

   docker build --build-arg eftlink_zip=<zip file containing eftlink build> --build-arg jre_zip=<zip file containing jre zip> --build-arg eftlink_user_uid=<user uid> --build-arg eftlink_user_gid=<user gid> -f Dockerfile -t eftlink:latest .

   For example,

   docker build --build-arg eftlink_zip=v22.0.0.326.zip --build-arg jre_zip=jre11.zip --build-arg eftlink_user_uid=9090 --build-arg eftlink_user_gid=9090 -f Dockerfile -t eftlink:latest.

Running the Docker Container

Before running the docker container you will need to copy files from a working eftlink installation and make them persistent.

If running in a docker swarm you can do this by using Docker volumes and Docker Configs or you could use a simple bind mount as shown below.

The recommended files and folders to persist are as follows:

- EftlinkConfig.properties
- eftlink-rest-api.properties
- jetty.xml
- log4j2.xml
- eftlink-rest-api-log4j2.xml
- keys/comms.keystore.properties
- keys/eftlink.private.jks
- keys/eftlink.public.jks
- keys/pos.private.jks
- keys/pos.public.jks
- logs
- core properties files for example, opiretail.properties and LangEN_OPIRetail.properties

Command example which will run a container with simple bind mounts:

docker run --name eftlink --user eftlink --publish 10100:10100 --publish 8443:8443 /

--volume <path to directory on the host machine>:/opt/eftlink/tmp /

--volume <path to directory on the host machine>:/opt/eftlink/keys

--volume <path to directory on the host machine>:/opt/eftlink/log /

--volume <path to file on the host machine>:/opt/eftlink/opiretail.properties /

--volume <path to file on the host machine>:/opt/eftlink/LangEN_OPIRetail.properties /

--volume <path to file on the host machine>:/opt/eftlink/EftlinkConfig.properties /

--volume <path to file on the host machine>:/opt/eftlink/eftlink-rest-api.properties /

--volume <path to file on the host machine>:/opt/eftlink/jetty.xml /

--tty --rm --interactive --workdir /opt/eftlink eftlink

EFTLink Advanced Configuration Features

See the *Oracle Retail EFTLink Framework Advanced Features Guide* located on OHC and refer to the chapter for the specific feature enrichment.

3
EFTLink Configurable Properties

This chapter describes the EFTLink properties:

Configuration Settings

The full set of configuration properties are defined and commented in `EftlinkConfig.properties`.

Key Settings

These settings must be set for all POS.

Table 3-1 Key Settings

Setting	Description	Example
EPSCore0	Name of EPS subsystem. Plugin cores must be specified by their full package name, and the package must also be added to the execution class path. EPSCore0 is mandatory. Note: EPSCore0 is set by `installcore.bat` / `installcore.sh`.	`EPSCore0 = manito.eft.pointus.PointUSCore`
DisplayLanguage	Language for display texts. For whichever country code is set, there must be a matching `LangXX.properties` file. A hierarchy is implied for example EN_US is taken as an extension of EN.	`DisplayLanguage = EN`
LanguageFolder	The location of the `Lang<CC>_<Core>.properties` files exist. Support relative path. Not permitted to traverse outside of installation folder.	`./lang`

Secondary Settings

These settings are normally correct at their default values, but can be overridden if necessary:

Table 3-2 Secondary Settings

Setting	Description	Default	Example
NumEPSCores	The number of active EPS cores list specified by EPSCore<n>	1	`NumEPSCores = 2`
ServerChannel0	Socket that EFTLink listens on for incoming Channel 0 requests from POS.	10100	`ServerChannel0 = 10100`
ServerChannel1	Socket that EFTLink uses to send Channel 1 Device Requests to POS.	10101	`ServerChannel1 = 10101`
Channel1IP	IP that EFTLink uses to send Channel 1 Device Requests to POS.	localhost	`Channel1IP = IP ADDRESS`
TLSEnabled	Whether to use Transport Layer Security (TLS) between the core and the framework.	true	`TLSEnabled = true`
TLSExpiry	Specify whether to enforce expiry of TLS certificates, based on expiry date. Note. Self-certified certificates created by the "CreateKeys" script files will expire after a maximum of 750 days.	true	`TLSExpiry = false`
TLSExpiryWarningLogDays	Specify the number of days prior to TLS certificate expiry that clear warnings will be included in log files during communication sessions.	90	`TLSExpiryWarningLogDays = 180`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
TLSExpiryWarningMessageDays	Specify the number of days that clear warnings presented to the operator at start of day prior to TLS certificate expiry.	90	`TLSExpiryWarningMessageDays = 90`
OPIServerDelegate	Allows the OPIServer operation to be delegated to an alternate class		`OPIServerDelegate = manito.eft.tlog.TLogOPIServer`
InvalidCorePromptTimeout	Timeout in seconds for displaying the TXT_INVALID_CORE message to the operator.	10	`InvalidCorePromptTimeout = 5`
SingleSocket	Whether EFTLink is to be accessed via a single common server socket, with messages routed by POS ID Note: In this mode, channel 1 will run on the same client socket as channel 0.	false	`SingleSocket = true`
LineDisplayEnabled	If set to false, all Sale State Notifications will be ignored and not passed on to any active EPSCore.	true	`LineDisplayEnabled = false`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
DelegateLineDisplay	If set to true a delegated list will be used to control which core receives Sale State Notification requests. Applicable only when 'DelegateLineDisplay' is set to true.	false	`DelegateLineDisplay = true`
LineDisplayDelegateList	A comma separated list of all cores that are to receive Sale State Notification requests.		`LineDisplayDelegateList = 0,1,2`
EwalletCore	A particular core can be designated to handle EWallet operations.	0	`EwalletCore = 1`
GiftCardCore	A particular core can be designated to handle Gift Card operations.	0	`GiftCardCore = 1`
CustomFormCore	A particular core can be designated to handle custom forms operations.	0	`CustomFormCore = 1`
ReferralCore	A particular core can be designated to handle Referrals.	0	`ReferralCore = 1`
SelfReferralEnabled	Whether to allow a core to handle its own referral.	false	`SelfReferralEnabled = true`
NumServers	Determines how many instances of the OPIServer to enable in server mode. In normal stand alone or non-server mode, set this to 0.	0	`NumServers = 1`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
PEDPoolEnabled	Whether to enable PED pooling in server mode. The NumServers should be set to a number greater than zero. In PED pooling mode, the PEDs can be shared among POS clients.	false	`PEDPoolEnabled = true`
PEDPoolOneCatchAllChannel0	Whether to open just one port for channel zero in PED pooling mode.	false	`PEDPoolOneCatchAllChannel0 = true`
Server<n>.description	The list of server or PED identifier. This is mandatory when in PED pooling. *n is a positive number starting at 1 and up to NumServers above.		`c`
NumClients	Determines how many potential clients when using PED pooling. This is mandatory in PED pooling.	2	`NumClients = 1`
posN.description	The list of POS identifier where N is a positive number starting at 1. This is mandatory in PED pooling.		`pos1.description = POS 1`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
posN.subpool	Restrict the list of server or PED for a particular POS where N is the workstation ID. A default association can also be specified by prefixing the server ID with '*'.	null	`pos1.subpool = *EFT 1, EFT 2 pos2.subpool = EFT 1, EFT 2` In the above example, register 1 by default will use EFT 1 if it's free. Both EFT 1 and EFT 2 servers is available for both registers (1 and 2).
ProtocolsWhiteList	Restricts the protocols which are permissible in the connection between POS and EFTLink Server. Default only allows for TLS 1.2 security.	SSLv2Hello,TLSv1.2	`ProtocolsWhiteList=SSLv2Hello, TLSv1.2`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
CipherWhiteList	Restricts the ciphers which are permissible in the connection between POS and EFTLink Server. The whitelist only includes ciphers which are approved under Oracle Approved Technologies: Security Protocols.	TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256, TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384, TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256, TLS_AES_128_GCM_SHA256, TLS_CHACHA20_POLY1305_SHA256, TLS_AES_128_CCM_SHA256, TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384, TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256, TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256,TLS_ECDHE_ECDSA_WITH_AES_256_CCM, TLS_ECDHE_ECDSA_WITH_AES_128_CCM, TLS_DHE_RSA_WITH_AES_128_GCM_SHA256, TLS_DHE_RSA_WITH_AES_256_GCM_SHA384, TLS_DHE_RSA_WITH_AES_256_CCM, TLS_DHE_RSA_WITH_AES_128_CCM, TLS_DHE_DSS_WITH_AES_256_GCM_SHA384, TLS_DHE_DSS_WITH_AES_128_GCM_SHA256, TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256	CipherWhiteList = TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256, TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384, TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256, TLS_AES_128_GCM_SHA256, TLS_AES_256_GCM_SHA384, TLS_CHACHA20_POLY1305_SHA256, TLS_AES_128_CCM_SHA256, TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384, TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256, TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256, TLS_ECDHE_ECDSA_WITH_AES_256_CCM, TLS_ECDHE_ECDSA_WITH_AES_128_CCM,TLS_DHE_RSA_WITH_AES_128_GCM_SHA256, TLS_DHE_RSA_WITH_AES_256_GCM_SHA384, TLS_DHE_RSA_WITH_AES_256_CCM,TLS_DHE_RSA_WITH_AES_128_CCM, TLS_DHE_DSS_WITH_AES_256_GCM_SHA384, TLS_DHE_DSS_WITH_AES_128_GCM_SHA256, TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example

CipherBlackList	CipherBlackList	SSL_.*,
		TLS_EMPTY_.*,
		.*_SHA,
		.*_3DES_.*,
		.*_DES_.*,
		.*_WITH_NULL_.*,
		.*_anon_.*,
		.*EXPORT.*,
		.*LOW.*,
		.*MD5.*,
		.*DES.*,
		.*RC2.*,
		.*RC4.*,
		.*PSK.*
		TLS_DH_.*
			`CipherBlackList=`
			`SSL_.*,`
			`TLS_EMPTY_.*,`
			`.*_SHA,`
			`.*_3DES_.*,`
			`.*_DES_.*,`
			`.*_WITH_NULL_.*,`
			`.*_anon_.*,`
			`.*EXPORT.*,`
			`.*LOW.*,`
			`.*MD5.*,`
			`.*DES.*,`
			`.*RC2.*,`
			`.*RC4.*,`
			`.*PSK.*,`
			`TLS_DH_.*`

PosType	POS type that EftLink is connected to. This can be set explicitly (for example, Lucas, Retail-J, Oscar) or set to "Auto" for the POS type to be deduced from the OPI	Auto	`PosType = Auto`
Dynamic Configuration	Static/Dynamic Configuration EFTLink can be configured to pick up its configuration dynamically from POS messages. A default setting is implied by the POS type setting, but this can be overridden.	false	`DynamicConfiguration = false`
PosIfsfCompliance	The level of IFSF compliance for the POS interface - IFSF or LUCAS.	Lucas	`PosIfsfCompliance = Lucas`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
Decimal Places	Number of decimal places to show.	2	`DecimalPlaces = 2`
DelegatedDisplay	Whether to use a display server delegate class to control pop-up dialogs directly from EFTLink instead of via Channel1.	false	`DelegatedDisplay = true`
DelegatedDisplayHandler	Class implementing pop-up dialogs.	manito.deviceproxy.DeviceProxy	`DelegatedDisplayHandler = manito.deviceproxy.DeviceProxy`
DelegatedDisplayOverride	Optional override to revert some display operations back to the POS.	0	`DelegatedDisplayOverride = 0`
ShowPrintingDialog	Whether to precede each print request with a TXT_PRINTING (for example, "Printing. Please Wait") dialog.	false	`ShowPrintingDialog = false`
ForcedInput	Whether to request forced input (no cancellation) on input requests to the POS, if not explicitly set by the core.	false	`ForcedInput = true`
DeviceEvents	Whether device events such as CardInserted are supported by the POS. Default false.	false	`DeviceEvents = false`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
PrinterPoolEnabled	Whether to run a pool of printers shared between POSs. (many-many link) Printer pool is accessed via the "master" channel 0. Channel 1 will run on the same client socket as channel 0.	false	`PrinterPoolEnabled = true`
PaymentWithLoyalty	Whether combined payment with loyalty is supported. Combined payment with loyalty is automatically disabled if a part payment is detected.	true	`PaymentWithLoyalty = false`
ValidateItemValues	Whether the basket content should be validated to ensure that the sum of the items matches the overall value. Default true.	true	`ValidateItemValues = true`
PrinterImpliedOnline	Whether the printer can be assumed to be online and available, that is, if the POS can only send requests when the printer is online and with paper, there is no need to do an explicit check.	false	`PrinterImpliedOnline = false`
ClearDisplayAfterTimeout	Whether to clear the display by sending an empty prompt to the POS after a timeout.	false	`ClearDisplayAfterTimeout = false`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
CURRENCY_<currency symbol>	Currency symbol conversion list.		`CURRENCY_156 = GBPCURRENCY_163 = GBPCURRENCY_164 = EURCURRENCY_213 = EUR`
DespoolOnLogon	Spooled reports are automatically printed on next logon.	false	`DespoolOnLogon = true`
DespoolOnMaintenance	Spooled reports are automatically printed on next maintenance/ administration use.	true	`DespoolOnMaintenance = false`
DespoolOnReconciliation	Spooled reports are automatically printed at next shift close.	true	`DespoolOnReconciliation = false`
DistributedDayend	Whether EFTLink is to relay POS reconciliation message on to other instances of EFTLink. # If set true, EFTLink uses the same day end client list as for manito.eft.opi.server.Dayend	false	`DistributedDayend = false`
NumDayendClients	List of client systems to which a reconciliation message should be sent by the manito.eft.opi.server.Dayend operation. Number of clients to be processed.	0	`NumDayendClients = 1`
DayendClient<n>IP	IP of remote system where EFTLink is running.		`DayendClient0IP = xxx.x.x.x`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
DayendClient<n>Channel0	Port which EFTLink is running.		`DayendClient0Channel = 10100DayendClient1Channel0= 10100DayendClient2Channel0= 10100DayendClient3Channel0= 10100DayendClient4Channel0= 10100`
DayendClient<n>Batch	Batch file to be run locally instead of sending message.		`DayendClient0Batch = dayend.bat`
DayendClient<n>Core	Specific individual core to send the request to.		`DayendClient0Core = EftDevice`
AllowMapMachineNameToSystemAccount	Allow the application to correctly secure access to data folders when running under the Windows Local System Account. It is strongly recommended that the application is not configured to run using the Windows Local System account, instead use the Windows Local Service account when use of a local Windows machine account is desired. Note that the Windows Network Service account should not be used.	false	`AllowMapMachineNameToSystemAccount = false`
https.proxyHost	Sets the https proxy host.		`https.proxyHost=adc-proxy.example.com`
https.proxyPort	Sets the https proxy port.		`https.proxyPort=80`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
http.proxyHost	Sets the http proxy host.		`http.proxyHost=adc-proxy.example.com`
http.proxyPort	Sets the http proxy port.		`http.proxyPort=80`
ImagePathWhitelist	Comma delimited list of permissible paths for image files used in device request XML. For example, c:/Images,c:/eftfolder/resources/images 'Any' or a blank can be used but having no entry serves the same purpose.		`ImagePathWhitelist = Any`
DisplayListOfPEDForFailure	In PED pooling mode, this determines if Eftlink displays the list of PEDs when the request failed or declined using the default PED. This is to give the user an option to select another PED in the next request.	false	`DisplayListOfPEDForFailure = false`
CardRangeFile	The name and location of the range xml file.	Defaults to cardrange.xml file located within the root of the eftlink installation directory	`./rangefile/cardrange.xml`
SystemInformationLoggingEnabled	Enable logging of system information at startup	True	`SystemInformationLoggingEnabled = true`
communications.keystore.iterations	Specify number of iterations. Valid range 10000 to 100000	10000	`communications.keystore.iterations = 10000`
communications.keystore.hashbytesize	Specify hash byte size. Valid values 256, 384, 512	384	`communications.keystore.hashbytesize = 384`

Table 3-2 (Cont.) Secondary Settings

Setting	Description	Default	Example
communications.keystore.digest	Specify digest Valid values SHA-256, SHA-384, SHA-512	SHA-512	`communications.keystore.digest = SHA-512`
communications.keystore.secretkeyspec	Specify keyspec, currently only AES supported.	AES	`communications.keystore.secretkeyspec = AES`
communications.keystore.factoryinstance	Specify factory, currently only PBKDF2WithHmacSHA512 supported.	PBKDF2WithHmacSHA512	`communications.keystore.factoryinstance = PBKDF2WithHmacSHA512`
communications.keystore.keystoretype	Specify Keystore type. Currently only JKS is supported.	JKS	`communications.keystore.keystoretype = JKS`
ContentMaskList	Comma delimited list of XML fields to be masked on log.		`ContentMaskList= StoreName, StoreAddress1`
OriginalPSPNamesToBypassPSPChecking	Comma delimited list of EPSCore names to skip for checking that takes place on follow on transaction (Voids and Referenced Refunds).		`OriginalPSPNamesToBypassPSPChecking= Simulated, oracle.eftlink.opiretail.OPIRetailCore`

4

EFTLink General Information

This chapter provides general information about EFTLink:

Tender Mapping

EFTLink provides a table - CardRange.xml - for mapping EFT cards to POS tenders. This is done by card IIN range, or, where that is not possible, by card name (also known as card circuit). The resulting numeric code is returned to the POS so that it can determine which tender to allocate the payment to. By default, the table maps all card to a single "type" (or tender) by a simple wildcard catchall. This can be used as-is, but if a more detailed breakdown of card type is needed; the relevant card ranges must be added to the file.

CardRange.xml can also be used to map cards by range to a suitable description for display on the receipt. CardRange.xml includes comments to explain the layout.

It is anticipated that each POS development team will want to prepare a suitable CardRange.xml for their specific POS requirements, in which case the file can be replaced as required.

> **Note:**
>
> For more information, see the *Oracle Retail EFTLink CardRange.xml Guide* available on My Oracle Support (Doc ID 2266221.1) using the following link:
>
> `https://support.oracle.com/rs?type=doc&id=2266221.1`

For eWallet tenders, EFTLink supports the following codes on CSRequest.WalletData.WalletType field:

Table 4-1 Supported eWallet Tenders

Code	Description
ACIPAYAFTER	ACIPayAfter
AFFIRM	Affirm
AFRICAN_EWALLETS	African eWallets
AFTERPAY	AfterPay
AIRTEL	Airtel
ALIPAY	AliPay

Table 4-1 (Cont.) Supported eWallet Tenders

Code	Description
ALLIED_WALLET	Allied Wallet
AMAZON_PAY	Amazon Pay
AME	AME
ANDROID_PAY	Android Pay
APPLE_PAY	Apple Pay
ATOME	Atome
CHASE_PAY	Chase Pay
DANA	DANA
DWOLLA	Dwolla
FOURALL	4All
GCASH	GCash
GENERIC_EWALLET	Generic eWallet
GOOGLE_PAY	Google Pay
GRAB_PAY	GrabPay
IZPAY	Izpay
KAKAO_PAY	KakaoPay
KLARNA	Klarna
LAYBUY	LayBuy
LINE	Line
LYF_PAY	Lyf Pay
MASTERPASS	MasterPass
MERCADO_PAGO	Mercado Pago
MOBIKWIK	MobiKwik
MOBILEPAY	MobilePay
MOMO_WALLET	MoMo Wallet
OPENPAY	OpenPay
PAGSEGURO	PagSeguro
PAY_BY_BANK_APP	Pay By Bank app
PAYBACK	PayBack
PAYLIB	Paylib
PAYMAYA	PayMaya
PAYPAL	PayPal
PAYTM	Paytm
PAYUNIQUE	PayUnique
PICPAY	PicPay
PIX	PIX
QUADPAY	QuadPay
RESERVE_1	Reserve 1

Table 4-1 (Cont.) Supported eWallet Tenders

Code	Description
RESERVE_2	Reserve 2
RESERVE_3	Reserve 3
RESERVE_4	Reserve 4
RESERVE_5	Reserve 5
RESERVE_6	Reserve 6
RESERVE_7	Reserve 7
RESERVE_8	Reserve 8
RESERVE_9	Reserve 9
RIACHUELO	Riachuelo
SAMSUNG_PAY	Samsung Pay
SEMPARAR	SemParar
SEQR	SEQR
SEZZLE	Sezzle
SPLITIT	SplitIt
SWISH	Swish
TAPAGO	TáPago
TICKETLOG	TicketLog
TROCO_SIMPLES	Troco Simples
TWINT	Twint
UNKNOWN	Unknown
VEEDIGITAL	VeeDigital
VENMO	Venmo
VIPPS	Vipps
WECHAT_PAY	WeChat Pay
YOYO_WALLET	Yoyo Wallet
ZIP	Zip

Logging - EFTLink Framework and Core

EFTLink uses a standard java logging package - `log4j2`. It maintains a daily log file - `eftlink_YYYY-MM-DD.log` - and deletes log files after 30 days. Both the framework and the core log into this file.

Log files are in the log subdirectory and are created as soon as EFTLink starts. By default, info level logging is enabled. This means that key information is logged but the files are kept as small as possible.

To keep files for longer, or increase the logging level, set `log4j2.xml` appropriately. Edit the `log4j2.xml` configuration file which is in the main EFTLink directory.

For debug logging change the following entry:

```
<Root level="info">
```

to

```
<Root level="debug">
```

Logging at debug level does not noticeably affect system performance but does generate larger log files. To retain log files for longer, edit:

```
<Delete basePath="log" maxDepth="1"> <IfLastModified age="30d" /></Delete>
```

and alter the age parameter to several days to keep files after the current day (default is 30d).

Consider available disk space when choosing several days to retain log files.

Multiple log files are configured in the standard `log4j2.xml` configuration file:

- EFTLinkGlobal - contains log information from all sources
- EFTLink - contains log information from the framework

A core may have its own `log4j2.xml` configuration file copied in during install to log to additional files for 3rd party libraries.

After installing EFTLink as a service, then starting the service, the log file will show about 16 lines, with some basic information, and log that it is deferring all initialization until POS type is known. Once a POS starts, you see details of the core started, with the settings used by the core and initialization progress logged, along with subsequent processing data.

In the case of a MultiServerLauncher / PedPooling installation, the standard `log4j2.xml` file requires alteration to include server appenders/loggers. See installation document for further details.

Translation

Translation is the process of interpreting and adapting text from one language into another. Although the code itself is not translated, components of the application that are translated may include the following, among others:

- Graphical user interface (GUI)
- Error messages

The following components are not usually translated:

- Documentation (for example, Online Help, Release Notes, Installation Guide, User Guide, Operations Guide)
- Batch programs and messages
- Log files
- Configuration Tools
- Reports
- Demo data
- Training Materials

Most display messages are generated by the core in use or by the host, in which case they are displayed without change. There are also some display messages generated

by EFTLink itself. These are defined in `LangEN.properties`, which is held externally in the root folder of EFTLink - if necessary, the file in the EFTLink root folder can be edited.

The EFTLink framework supports several other languages. Setting EFTLink framework to use one of these is in `EftLinkConfig.properties`

```
DisplayLanguage = EN
```

Possible values include:

Table 4-2 Display Language Settings

Language	Setting
Chinese (Simplified)	CN
German	DE
English	EN
Spanish	ES
French	FR
Italian	IT
Japanese	JP
Dutch	NL
Portuguese	PT
Russian	RU
Swedish	SV

Each of these has its own language property file, for example `LangDE.properties`. The file is held in the root EFTLink folder where it can be edited.

> **Note:**
>
> The languages that do not use the Latin alphabet have the characters defined in Unicode in their property file. To display messages in Chinese, Japanese or Russian the operating system must support those languages.

Setting the value `DisplayLanguage =`

in `EftlinkConfig.properties` will also control which language a core will use for core specific translations.

Table 4-3 Core Specific Translations

Core	Language Included
Adyen	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
AJB FiPay	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
Cayan	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish

Table 4-3 (Cont.) Core Specific Translations

Core	Language Included
OPI Retail	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
PaybyLink	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
PayPal	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish

Table 4-3 (Cont.) Core Specific Translations

Core	Language Included
SixPayment Services MPD	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
Tender Retail	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
The Logic Group SolveConnect	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
Verifone Ocius Sentinel	No translation included

Table 4-3 (Cont.) Core Specific Translations

Core	Language Included
Verifone Point US	Chinese (Simplified) German English Spanish French Italian Japanese Dutch Portuguese Russian Swedish
World Pay	No translation included

A

Appendix: Installation Order

This section provides a guideline as to the order in which the Oracle Retail applications should be installed. If a retailer has chosen to use some, but not all, of the applications the order is still valid less the applications not being installed.

> **Note:**
>
> The installation order is not meant to imply integration between products.

Enterprise Installation Order

1. Oracle Retail Merchandising System (RMS), Oracle Retail Trade Management (RTM)
2. Oracle Retail Sales Audit (ReSA)
3. Oracle Retail Extract, Transform, Load (RETL)
4. Oracle Retail Warehouse Management System (RWMS)
5. Oracle Retail Invoice Matching (ReIM)
6. Oracle Retail Price Management (RPM)
7. Oracle Retail Allocation
8. Oracle Retail Mobile Merchandising (ORMM)
9. Oracle Retail Customer Engagement (ORCE)
10. Oracle Retail Xstore Office
11. Oracle Retail Xstore Point-of-Service, including Xstore Point-of-Service for Grocery, and including Xstore Mobile
12. Oracle Retail Xstore Environment
13. Oracle Retail EFTLink
14. Oracle Retail Store Inventory Management (SIM), including Mobile SIM
15. Oracle Retail Predictive Application Server (RPAS)
16. Oracle Retail Predictive Application Server Batch Script Architecture (RPAS BSA)
17. Oracle Retail Demand Forecasting (RDF)
18. Oracle Retail Category Management Planning and Optimization/Macro Space Optimization (CMPO/MSO)
19. Oracle Retail Replenishment Optimization (RO)
20. Oracle Retail Regular Price Optimization (RPO)
21. Oracle Retail Merchandise Financial Planning (MFP)
22. Oracle Retail Size Profile Optimization (SPO)

23. Oracle Retail Assortment Planning (AP)
24. Oracle Retail Item Planning (IP)
25. Oracle Retail Item Planning Configured for COE (IP COE)
26. Oracle Retail Advanced Inventory Planning (AIP)
27. Oracle Retail Integration Bus (RIB)
28. Oracle Retail Service Backbone (RSB)
29. Oracle Retail Financial Integration (ORFI)
30. Oracle Retail Bulk Data Integration (BDI)
31. Oracle Retail Integration Console (RIC)
32. Oracle Commerce Retail Extension Module (ORXM)
33. Oracle Retail Data Extractor for Merchandising
34. Oracle Retail Clearance Optimization Engine (COE)
35. Oracle Retail Analytic Parameter Calculator for Regular Price Optimization (APC-RPO)
36. Oracle Retail Insights, including Retail Merchandising Insights (previously Retail Merchandising Analytics) and Retail Customer Insights (previously Retail Customer Analytics)
37. Oracle Retail Order Broker

Glossary

Card Circuit

A textual description of the card returned by the payment system, often where the payment system does not return a card IIN

Card IIN

The first few numbers of a card PAN that will identify the card type

IFSF

International Forecourt Standards Forum

DCC

Dynamic Currency Conversion. Converting a sale into the home currency of the card holder by the EFT payment system

JVM

Java Virtual Machine

PED

Pin entry device

PED Pooling

Where the EFTLink Server is used to manage a pool of PEDs to be shared between the POSs and allocated dynamically

Print Pooling

Where the EFTLink Server is used to manage a pool of printers to be shared between the POSs and allocated dynamically

Tender

A description or grouping of a payment type. Sometimes called a MOP (Method of Payment)