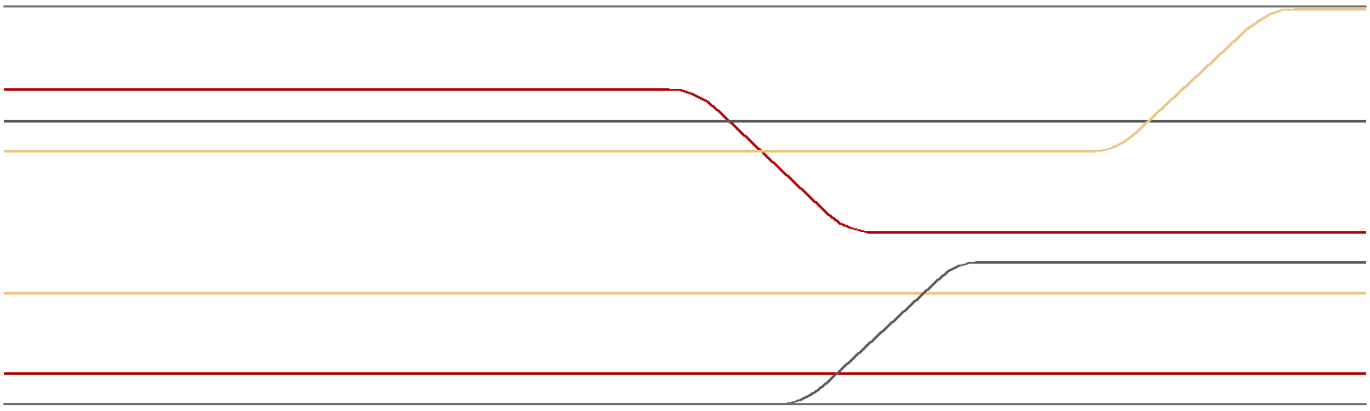
Payment Services

TIM: The SIX ECR Integration Module

1.4



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Version Table

Version	1.3
Date	16.03.2017
Status	Final
Author	C. Anderegg
Classification	internal

Approved By

Function	Name	Date

Amendment Control

Version	Author	Date	Change
1.0	C. Anderegg	09.11.2016	Release version.
1.1	C. Anderegg	16.11.2016	Fixed error.
1.2	C. Anderegg	28.11.2016	Fix in architecture drawing.
1.3	C. Anderegg, M. Beutler	16.03.2017	Added versioning description of *TIM SDK*.
1.4	C. Anderegg	05.04.2017	Added expected arrival times of *TIM SDK*.

Table 1: Amendment control

Open Points

Nr.	Description	PIC	Date / Priority

Table 2: Open Points

Constraints

Nr.	Description	PIC	Date / Priority
1			

Table 3: Constraints

Glossary

Abbreviation / Term	Description
API	Application Programming Interface
ASN.1	Abstract Syntax Notation One
DER	Distinguished Encoding Rules
ECR	Electronic Cash Register
EFT	Electronic Funds Transfer
POS	Point of Sale
SIXml	SIX ECR Integration Protocol
TIM	SIX Till Integration Module

Table 4: Abbreviations and Terms

1 Overview

1.1 Introduction

SIX provides a comprehensive solution to integrate EFT terminals with a POS ECR application.

The standard SIX POS integration architecture is based on the TIM API, the TIM Server and the SIXml and SPECTRE protocol suits providing reliable message transport and integration of foreign ECR protocols into the SIX system.

This document gives an overview of the components of the SIX POS integration environment and how they interact.

1.2 Versioning

The TIM SDK has the following name/version description *TIM SDK 2.2-4-1* which can be explained as follows:

- Name: TIM SDK
- Latest supported SIXml version: 2.2
- Feature release number: 4
- Patch number: 1

The name *TIM SDK* is always the same.

The latest supported SIXml version will change as soon as a new feature release of the SIXml protocol has been implemented, e.g. *SIXml version 2.3*.

The feature release number is incremented if new features have been implemented.

The patch number is incremented for each new build, e.g. is a bugfix has been made.

1.3 References

1.3.1 Basis Documents

Ref.	Document	Version
[B1]	TIM and SIXml Architecture	08/2015

Table 5: Basis Documents

2 Architecture Overview

The TIM Integration Framework is the standard way to integrate SIX EFT terminals into ECR systems.

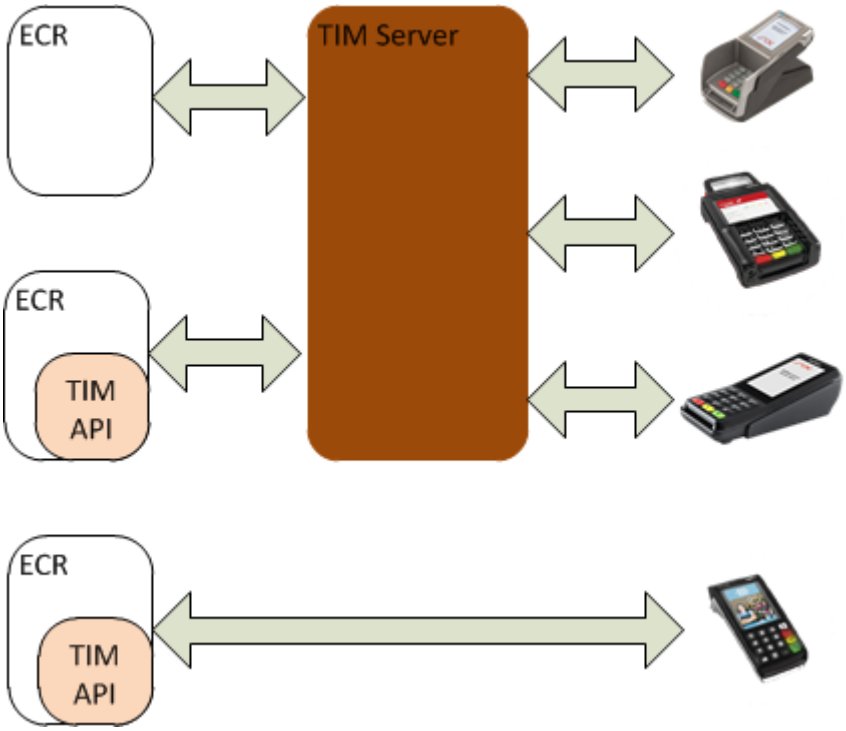

Figure 1: Architecture Overview of the TIM Integration Framework

The TIM Integration Framework consists of three parts:

- TIM API
- TIM Server
- EFT Terminal

The TIM API is a software library and SDK provided by SIX allowing for an easy integration of ECR applications to the SIX EFT terminals. The TIM API library is provided in several versions covering different operating systems and programming environments.

To allow for integration scenarios involving complex network setups, terminal sharing or ECR protocols foreign to SIX the TIM server acts as a bridge between the ECR and EFT terminal.

The communication between TIM API, TIM Server and the EFT terminal uses the SIXml protocol. The protocol can be used over TCP/IP (LAN and Wifi) and Bluetooth connections.

3 TIM API - The ECR Integration Module

TIM API, the Till Integration Module offers an easy access to the SIX EFTPOS environment for ECR developers.

Conceptually TIM API follows a layered approach. The top- and usual entry layer is the TIM API Core. It includes a set of automatisms which can be enabled or disabled according the customer's needs to automatically perform certain functions. Additionally a collection of support packages tailored to the needs of most business categories are provided which shall present the easiest way of an integration. The lowest layer is a collection of output modules connecting to the SIX EFT infrastructure.

Most SIX EFT terminals are accessed through the SIXml protocol.

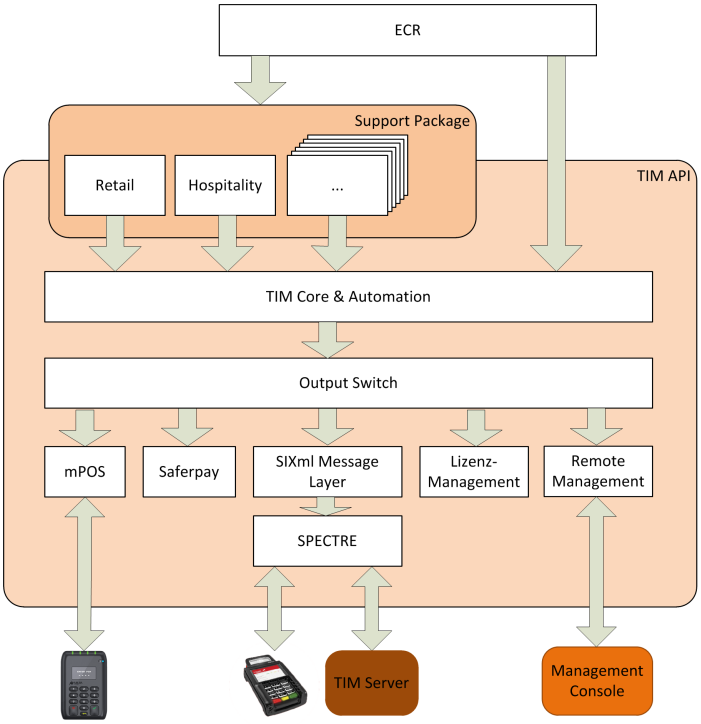

Figure 2: Architecture Overview of TIM API

TIM API is available for multiple programming environments and platforms:

- Java
  - Android
  - Windows
  - Linux
  - Mac OS
- .net (planned Q3/2017)
  - Windows XP-10 (.net Framework 2.0)
  - Windows 7-10 (.net Framework 4.0)
  - Windows 10 UWP
  - Xamarin
- Swift (planned Q3/2017)
  - iOS
  - MacOS

4 TIM Server - The SIX ECR Protocol Translation Module

TIM Server is the SIX solution for the integration of non-SIX and legacy ECR protocols. It operates as a protocol translator and is implemented as a standalone server application (Windows service or Unix daemon).

In a “SIXml in, SIXml out” configuration TIM Server can also serve as a bridge between network segments and enables the sharing of one EFT terminal between multiple ECRs.

Two TIM server instances can be run in a high-availability configuration on two separate machines.

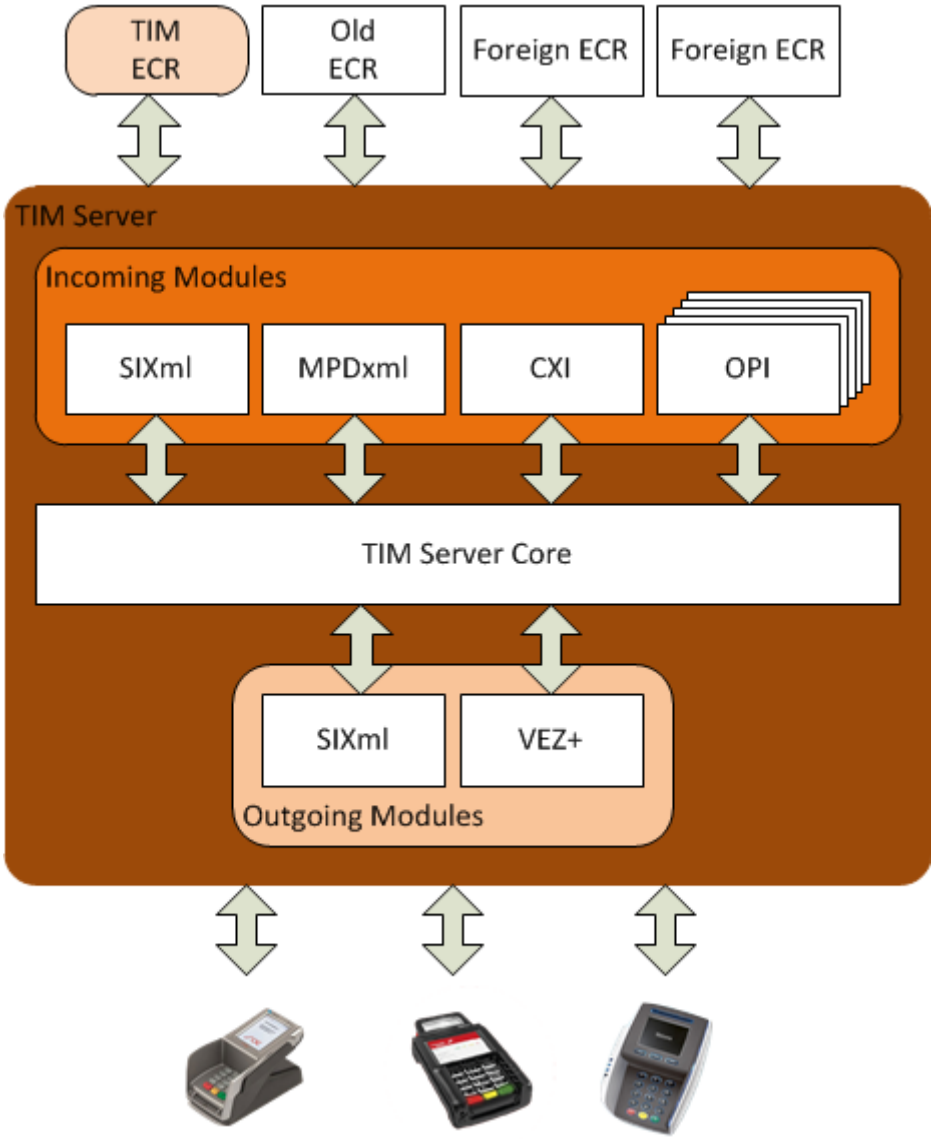

Figure 3: Architecture Overview of TIM Server

TIM Server is available for:

1. Windows
2. Linux

Refer to the server release notes for an up to date list of available incoming foreign protocols.

5 Integration Options

SIX TIM API and TIM Server can be used as a toolbox to enable most common POS integration scenarios. The following chapters show all scenarios supported in the SIX environment.

The integration options available depend on the TIM model licensed by the customer.

7.1 Full Integrated

In full integrated scenarios the merchant side of the EFT terminal is exclusively controlled by one or more ECRs.

7.1.1 Standard Setup

The standard SIX POS integration setup is based on an ECR application that integrates the TIM API. The TIM API gives the ECR access to the full range of the SIX EFT terminal portfolio via the SIXml protocol. The ECR may run either on a classic or mobile operating system.

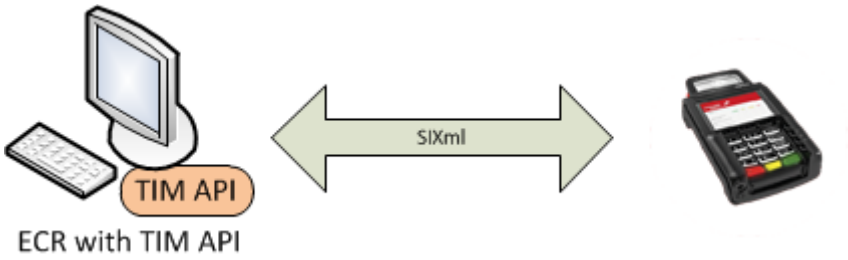

Figure 4: Full Integrated Setup

7.1.2 Multi ECR Setup with TIM Server

For SIXml terminals that do not offer multi ECR capability or in multi network segment scenarios the role of access broker for multiple ECRs to a single EFT terminal can also be taken by the TIM Server module.

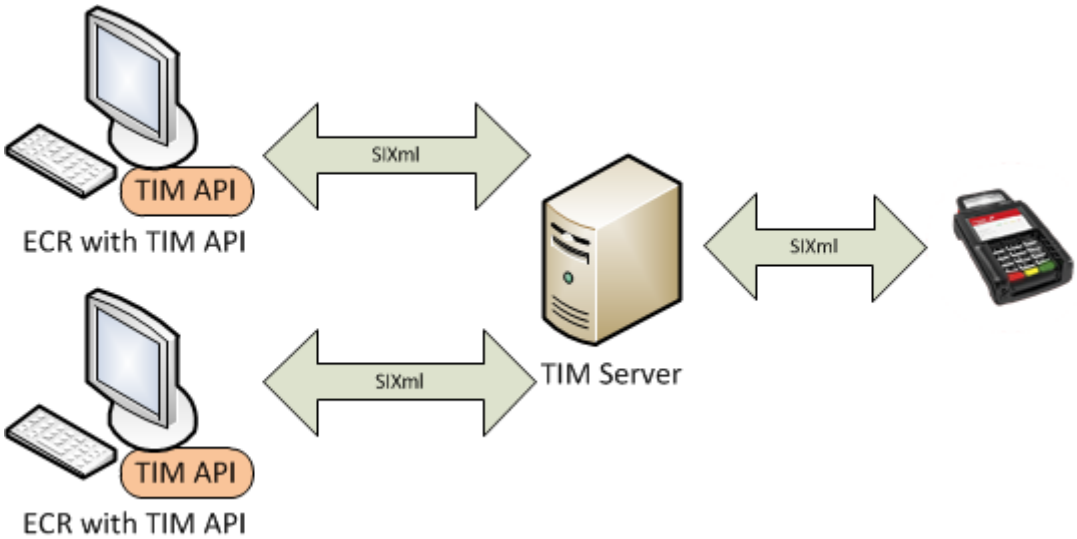

Figure 5: Multiple ECR sharing a EFT Terminal using TIM Server.

7.1.3 Network Segment Separation with TIM Server

If merchants IT requirements demand that the ECRs and the EFT terminals reside in physically separated ethernet network segments but the integration shall still use a TCP/IP connection a network bridge is necessary.

Among other tasks the TIM Server module can act as a central bridge between the network segments, offering the services

of the EFT terminals to the ECRs in the ECR network.

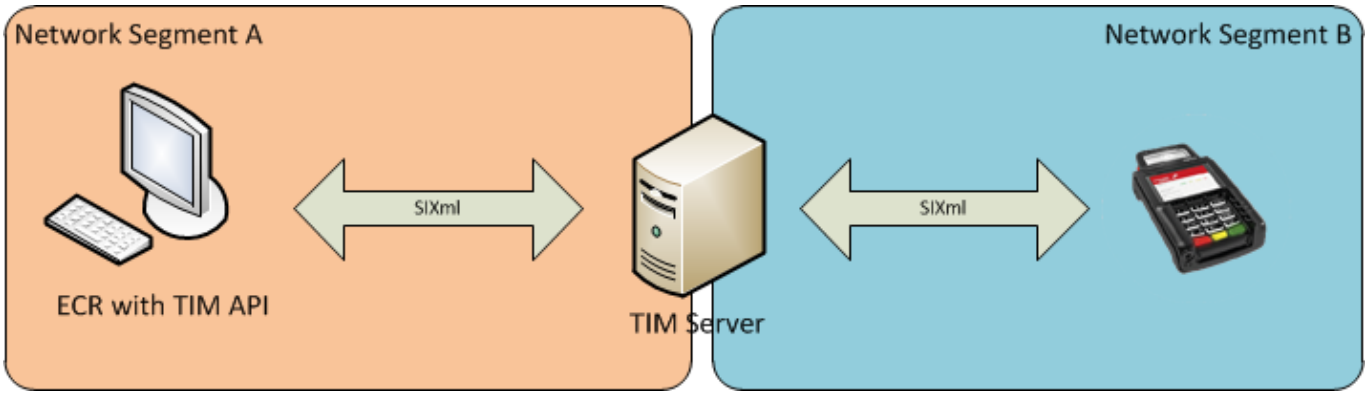

Figure 6: Full Integration with TIM server working as a network bridge.

7.1.4 Foreign ECR Protocol Integration with TIM Server

In order to connect existing ECRs to the SIX EFT terminal infrastructure the TIM Server module can take the role of a protocol converter. TIM Server offers incoming translation units for a number of common ECR protocols.

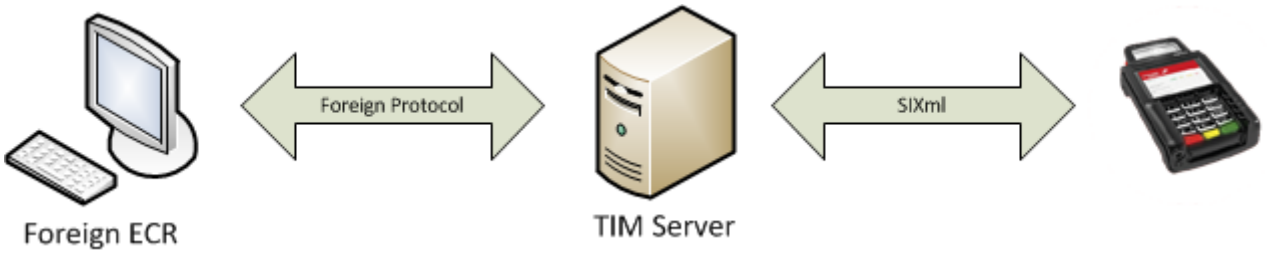

Figure 7: Full Integration with TIM Server translating a foreign protocol.

7.2 Mixed Mode

In mixed mode scenarios a terminal is controlled by both, a merchant unit and by one or more ECRs.

There are two use-cases for this setup. One, the ECR complexity may be reduced to only controlling transaction processing, leaving all administrative functions to the Merchant Unit. Two the Merchant Unit can act as a backup if the ECR is unavailable.

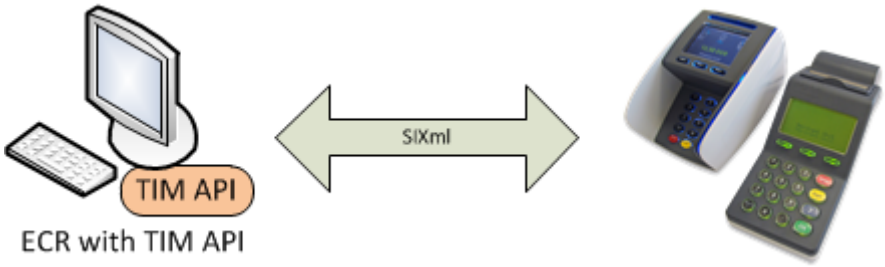

Figure 8: Mixed Mode “Autonom”-Setup

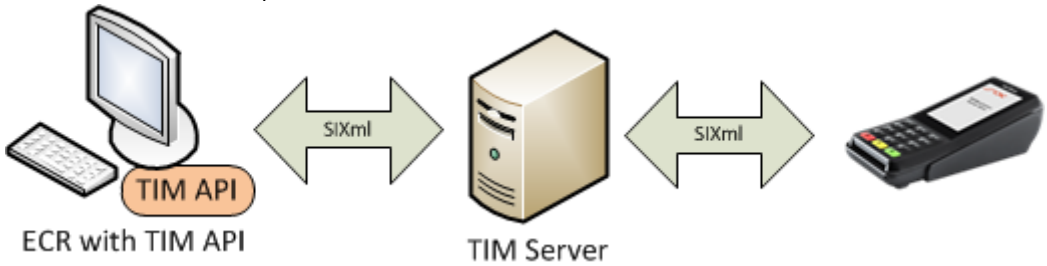

Figure 9: Mixed Mode “Compact”-Setup with ECR connection routed through TIM Server

6 Gateway Mode

Gateway Mode allows a EFT terminal to utilise a connected TIM API or TIM Server as a transparent gateway for TCP/IP traffic. This is useful for EFT terminals that do only have an ECR connection (e.g. mPOS devices with only a Bluetooth connection) to communicate to host systems for payment processing.

8.1 TIM API Acting as a Gateway

TIM API can act as a gateway for data that the EFT terminal generates and forwards it to its destination.

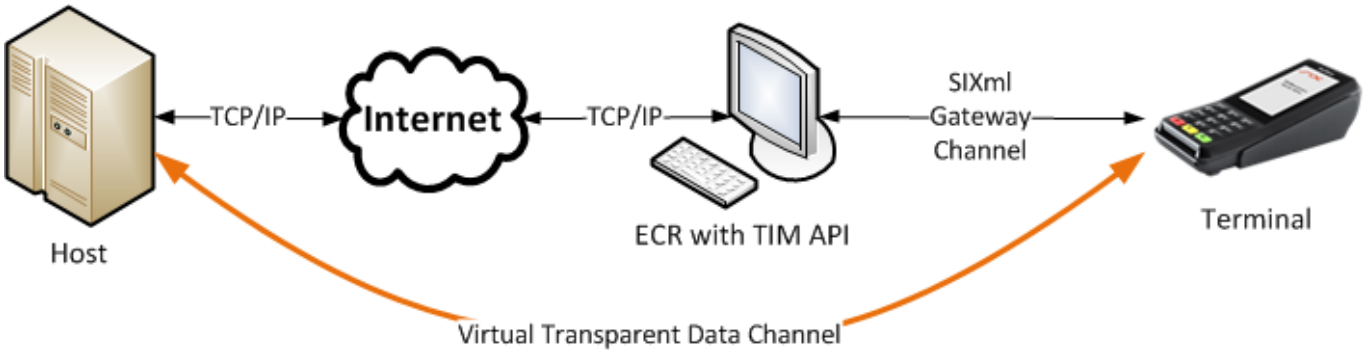

Figure 10: TIM API is the Gateway.

8.2 TIM Server Acting as a Gateway

TIM Server can act as a gateway for data that the EFT terminal generates and forwarsd it to its destination.

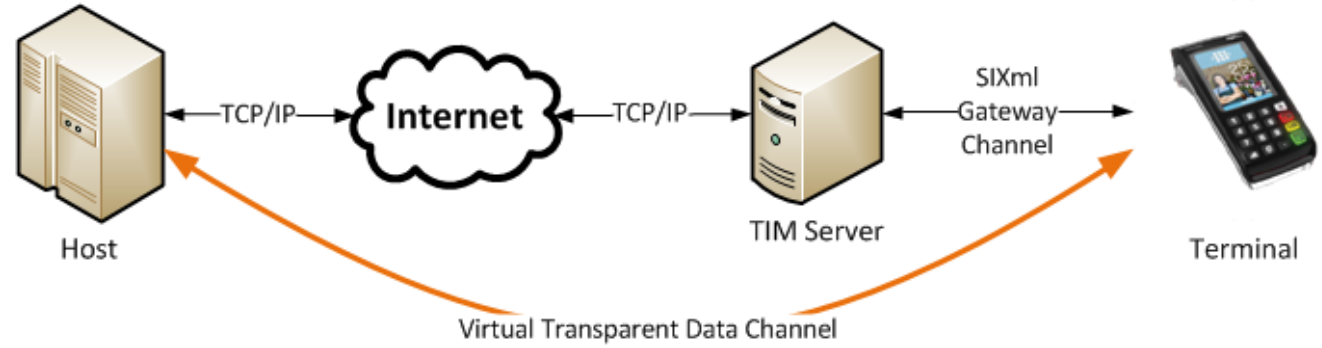

Figure 11: TIM Server is the Gateway.