PAYMENT ENGINE

OVERVIEW

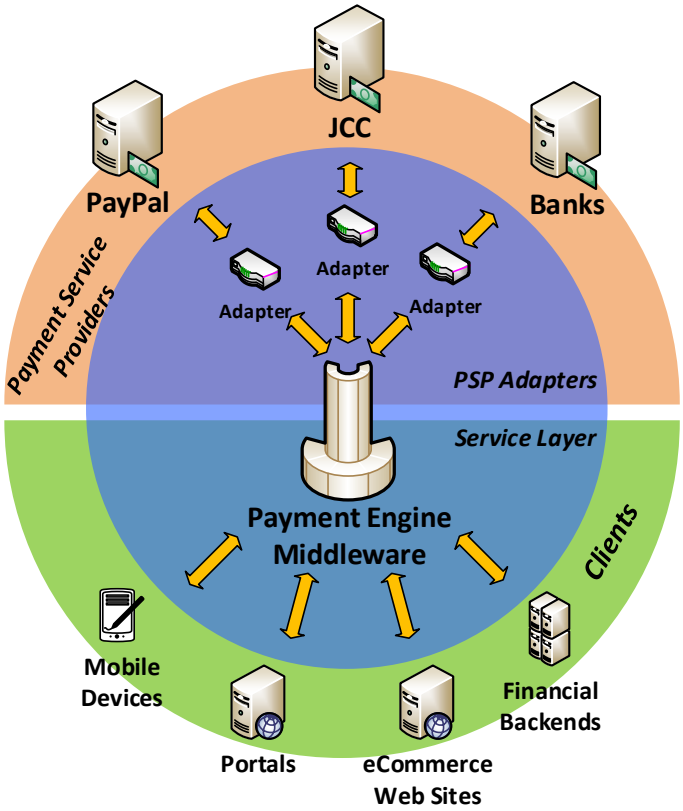
The Logicom Solutions **Payment Engine** enables an organization to facilitate electronic payments for their systems to external customers and partners, in a secure manner with minimal credit risk, effort, and timeframe.

BUSINESS NEED

Currently, there is no single universal industry standard protocol for internet electronic payments and each Payment Service Provider is providing its own implementation. This creates a recurring development overhead and adds complexity for client applications (e.g. e-Commerce sites) that want to provide multiple electronic payment methods. Each payment method implementation is different and must be separately developed, tested, and configured by the client application. This causes recurring development costs and lengthier times to market.

SOLUTION

The Logicom Solutions Payment Engine is a middleware platform that serves as a single channel, integrating client applications with various Payment Service Providers. The Payment Engine provides one universal integration protocol to the client applications for electronic payments. For any additional payment method, the Payment Engine absorbs the complexity of integrating with various Payment Service Providers, thus abstracting that complexity from the client applications. The Payment Engine also handles transaction reconciliation with Payment Service Providers and ensures that transactions are always synchronized and up to date. Moreover, the Payment Engine architecture is pluggable and expandable with new Payment Service Providers, thus making it future proof as a platform, while ensuring that client applications will be able to take advantage of the new payment methods in a seamless manner.



Key Features

- **Asynchronous** Payments (PSP Hosted Payments)
- **Synchronous** Payments (PSP APIs, Credit Card Tokenization, e.g. Saved Cards)
- **Batch** Payments
- Continuous transaction **reconciliation** with Payment Service Providers
- Real Time **Fraud Reduction** Rules and **Reporting**
- **Multi-Currency** enabled
- **Multi-tenant** capability
- **Modular** Architecture (Plugin adapters for PSPs)
- Offered as "On Premise Installation" and as "Cloud Service"

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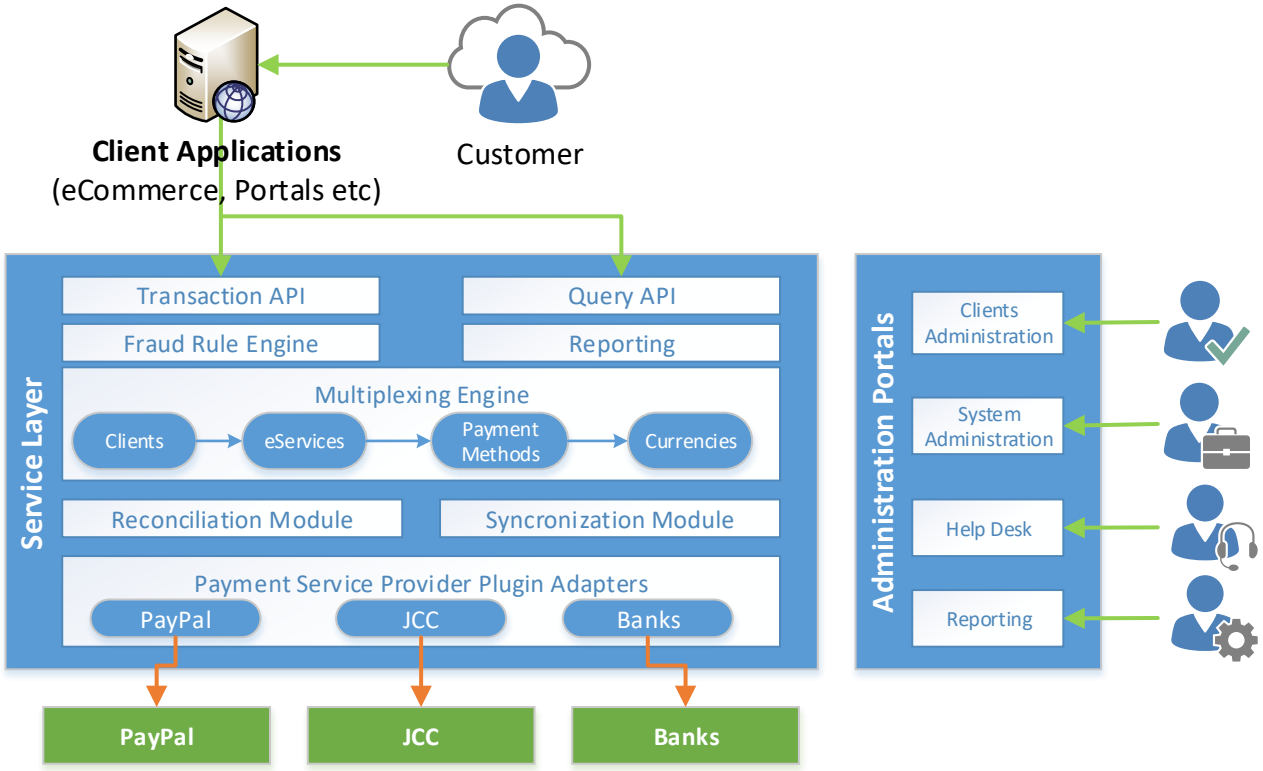
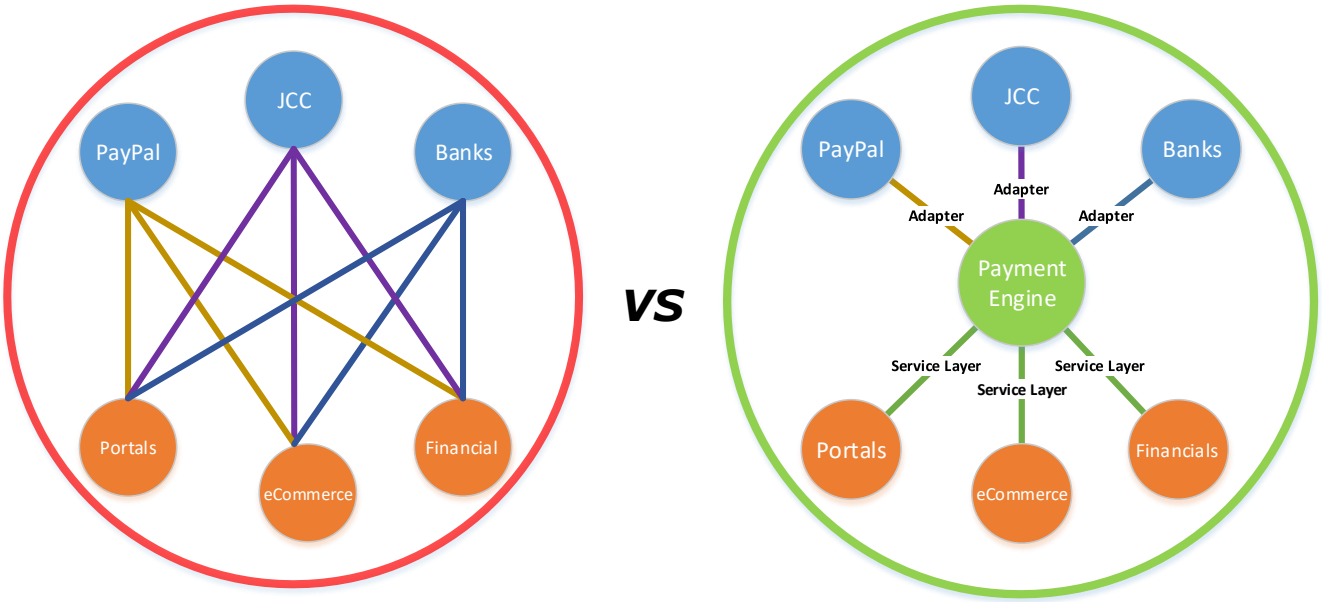
FUNCTIONALITY

- **Asynchronous Online Payment:** End users can perform credit or debit card payments for online e-Services. Payment functionality is triggered through web-services, made from the client portal/application to the payment engine. End users are redirected to the PSP Hosted Payment Page to complete the transaction. The Payment Engine awaits for an authorization from the Payment Service Provider (PSP) and presents the result (payment approval or rejection) to the end user.
- **Synchronous Online Payment:** End users can perform credit or debit card payments for the online e-Services. Payment functionality is triggered through web-services, made from the client portal/application to the Payment Engine. The payment is processed at real-time and the client portal/application awaits for an authorisation from the Payment Service Provider (PSP) and presents the result (payment approval or rejection) to the end user
- **Batch Payments:** Offline processing of batch payments.
- **Reporting:** The Payment Engine generates detailed reports about all payment activities for reconciliation and management purposes.
- **Continuous Reconciliation:** Reconcile on a daily basis all transactions that were processed (reconciliation involves both the payment amount processed and the amount that was finally credited to the bank account of the receiving party)
- **Real Time Fraud Reduction Rules:** Rules for detecting suspicious transactions in order to minimise and prevent fraud such as minimum/maximum amounts, maximum transactions per user per hour.
- **Processing of payments through the administration interface:** System operators can perform payments on behalf of an end user through the administration interface (MOTO).
- **Standard Integration Protocol for Clients:** Payment Engine provides a universal integration protocol to client applications for electronic payments. Protocol is based on XML/SOAP Web Services for cross-platform compatibility.
- **Multi-Currency enabled:** Enables transactions in multiple currencies (as per PSP).
- **Multiplexing Engine:** Client applications can be configured to use any of the available payment methods and currencies. Merchant agreements with PSPs can also be reused for multiple clients



KEY ADVANTAGES

- **Pluggable Architecture:** Payment Service Provider adapters can be plugged in or out of the platform making it future proof. Plugins do not affect the client applications as they are still communicating with the payment engine over a standard protocol.
- **Multi-layered architecture:** A well-known principle, dictating that autonomous and clearly bounded layers should be introduced in an architecture scheme. Each layer defines its boundaries via well-defined and secured interfaces. Typically layers are functionally depended on "lower" levels for most of their services. However this does not prevent a function to be fully implemented in an "upper" layer.
- **Scalability:** Each layer can scale out autonomously.
- **Service Orientation:** Service orientation is a dominant trend in modern architecture designs. Service-orientation is a design paradigm intended for the creation of logic units that are individually shaped so that they can be collectively and repeatedly utilized.
- **Modularity:** This principle is a more fine-grained "layered" principle. According to this principle, each layer is built on modular components. The sum of modules in a layer comprises the functional set of the layer. Modularity has a pivotal role during the design and implementation phase, modules are also autonomous and interact with other modules with code interfaces. In modern designs the term "component" is also frequent. Components are sets of modules that have specific functional roles in each layer.
- **Location transparency:** Payment Service Providers are hidden from the top layers. Client applications use services without knowing where the Payment Service Providers are. Bottom line is that client applications are not aware –and should not care- about the PSPs. The only communication point that client applications are aware of is the set of endpoints provided by the service layer.
- **Multi-Level Security:** There are strict security rules and mechanisms for the communications, message transmission and sensitive information storage.
- **SMS / Notifications:** The Payment Engine can be integrated with the Logicom Solutions **Notification Engine** for notifications over a wide range of protocols including SMS and emails.
- **Hub and Spoke Architecture:** Provides a flexible architectural pattern: The hub-and-spoke concept is easy to understand and work with, yet can be expressed in infinite variations.
    - **Fosters reuse:** One typically develops an interface—called a spoke—from the hub to a given system and then reuses that interface as more systems need to communicate with the first one.
    - **Reduces the number of interfaces:** The practice of spoke reuse fostered by hub-and-spoke architectures dramatically reduces the number of interfaces one needs to build and maintain



Point to Point Integration Architecture ***Hub and Spoke Integration Architecture***

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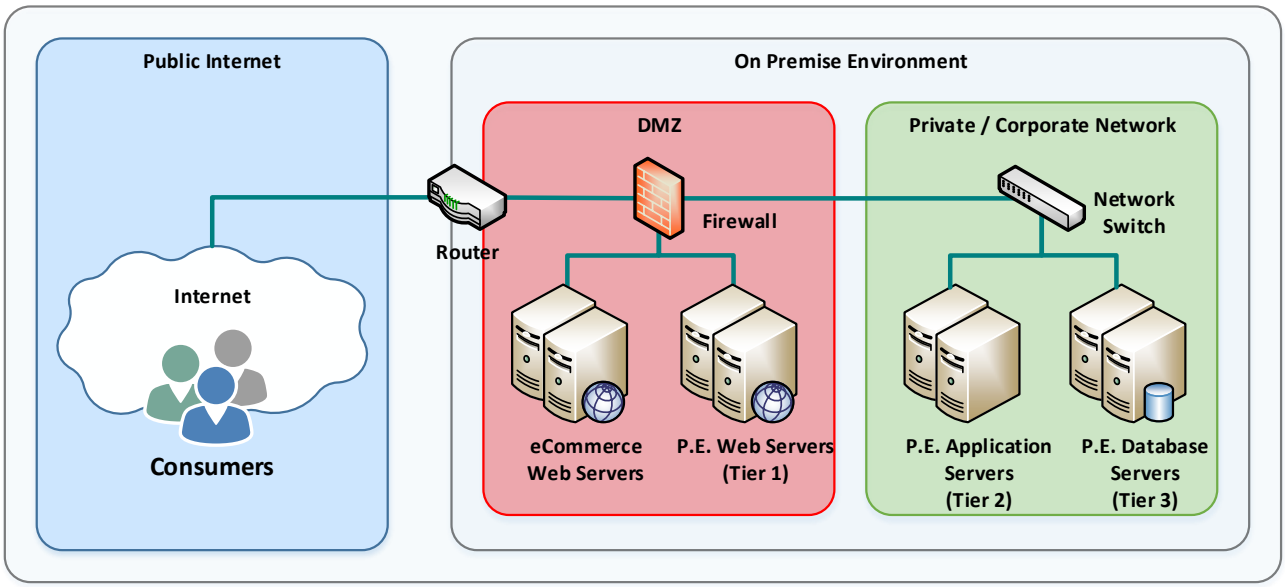
TECHNOLOGY



On-Premise Installation Topology

***Note**: The diagram does not reflect the real sizing of the solution. It defines the different security zones where each layer should be placed. It should not be considered as a complete physical diagram as it only illustrates the minimum requirements. E-Commerce Web Servers are not part of the solution, as they depict existing web applications for the purposes of illustrating the overall solution.*

Technologies

- Microsoft .NET Framework 4.5
- Windows Communication Foundation 4.5
- Microsoft ASP.NET 4.5

Server Products

- Microsoft Windows Server 2012 R2
- Microsoft SQL Server 2014
- Microsoft Windows IIS Server

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