

CITY OF LAKELAND PROPOSAL FOR PAYMENT KIOSK SOLUTION

For FLGISA Recognition

This document is intended to serve as a high-level overview of the City of Lakeland ePay / Kiosk project for consideration of recognition by FLGISA as an innovative solution for public use.

OVERVIEW

The City of Lakeland, Florida was charged by its City Commissioners to produce a convenient, real-time payment solution for the City of Lakeland citizenry. This solution needed to be “always-on, 24x7x365”, secure, reliable, user-friendly, cost-effective, and quick to market. The City of Lakeland ePay / Kiosk project commenced to meet this challenge.

The City of Lakeland (COL) and surrounding service areas are communities with diverse needs and our citizens expect quality solutions to meet or exceed those needs. Our commission requested a community-focused solution that would allow our citizens to pay for COL-provisioned utility service charges, citations, and other fees through a mechanism designed to be user-friendly, efficient, cost-effective, and produce real-time results. The result: the COL ePay / Kiosk solution, now presently deployed to the public, provides physical payment kiosks located conveniently in COL community areas with a technology infrastructure created to facilitate the functionality of these kiosks. The following sections of this document serve to describe, at a high level, the anatomy of this technology infrastructure and its benefits to the COL citizenry and internally as an efficient use of COL resources.

HIGH-LEVEL SOLUTION PLAN

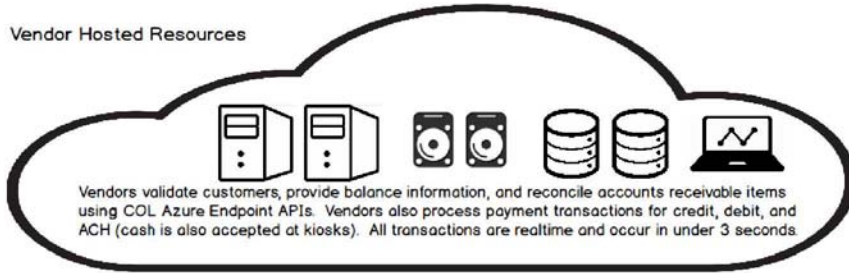
Careful deliberation on overall architecture with security, networking, development, and data integrations teams resulted in a hybrid-cloud architectural design. At a high level, the plan amounted to implementing a real-time transactional hub hosted in Microsoft's Azure Public Cloud. This hub consists of a set of authenticated and encrypted APIs available over the internet for pre-authorized and credentialed vendors to consume. This hub connects over a VPN tunnel to COL resources hosted internally in our datacenter. These internal resources are made available by a second authenticated, encrypted API set designed to facilitate real-time data retrieval and transactions.

Also included in the solution is a “Plan B” feature involving daily packaged data pumps into Azure SQL data-store. In the event of a COL outage or resource failure, the transactional hub API automatically and seamlessly selects the cloud backup data-source in order to offer services during the outage. Another part of “Plan B” involves a software buffering mechanism to store cleared financial transactions until the resolution of the outage. After restoration, the transactions are automatically retrieved and applied to customer accounts and real-time transactional functionality resumes. See diagram below:

Payment Kiosks Located Conveniently Citywide

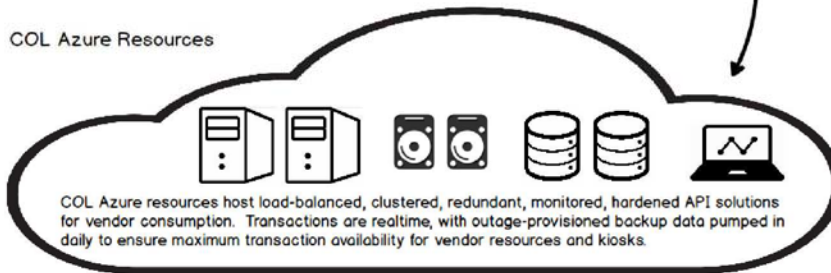


Vendor Hosted Resources



Realtime Customer Lookup and Accounts Receivable Item Processing API Traffic
 TLS-Secured over Internet

COL Azure Resources

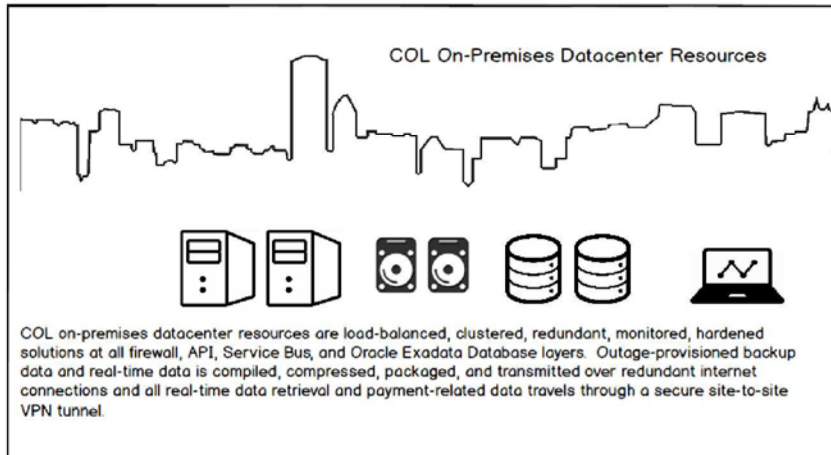


Realtime Customer Lookup and Accounts Receivable Item Processing API Traffic over Secure VPN Tunnel

Queued Payments Polling Service Outbound Traffic TLS Secured over Internet

Backup Data for Outages Daily Data Pump TLS-Secured over Internet

COL On-Premises Datacenter Resources



IMPLEMENTATION FEATURES

Microsoft Azure Public Cloud Infrastructure-as-a-Service (IaaS) Components:

- Site-To-Site VPN Tunnel: Allows secure transfer of encrypted data streams between the cloud transactional hub and the COL networked resources and virtualized representation of cloud resources within defined COL network subnets
- Scale-Out and Scale-Up Virtual Hosts: To accommodate minimization of cost, Azure Web Roles allow configuration of the load-balanced cluster of public API virtual machine hosts at the solution level, by count, load-balancing algorithm, and performance per host, globally available
- Firewalls: Employed at each level of the cloud architecture, configured at the solution level
- Storage: Scalable, globally available, redundant storage of all data related to the Azure IaaS and PaaS resources

Microsoft Azure Public Cloud Platform-as-a-Service (PaaS) Components:

- Azure SQL: Automatically scalable SQL database platform providing Microsoft DBA-managed virtual database engine used for backup-data hosting, transactional buffering and logging
- Microsoft Azure SDK Cloud Service Web Roles: Configured at solution-level design-time and abstracts the web-server setup and configuration to a document included as part of the solution publishing process allowing a DevOps development process oriented around “problem solving through software development” and “click-once” publishing of a solution and its underlying hardware/software dependencies as a single PaaS package

ePay Software Solution Features:

- End-to-End solution programmed in C# using best-practices test-driven, modular design
- WCF SOAP data-contract and operation-contract authenticated API endpoints protecting all sensitive workflow-oriented software and architectural resources.
- Fully-Asynchronous process design allowing maximum transactional throughput and efficiency
- End-to-End Encryption of all data traffic from COL datacenter to Azure Cloud to Endpoint Client
- Quality of Service monitoring at every level of the COL and cloud resource infrastructure
- Real-time and outage-scenario provisioned for maximum availability and uptime

RESULTS AND BENEFITS

The City of Lakeland is proud to announce the ePay / Kiosk solution began public utilization the same day it was released. Our customers for the first time are able to transact real-time balance lookups and payments for their utilities and other services. Further, they can do so conveniently from kiosks located in their neighborhoods, 24 hours per day, using cash, check, debit, or credit. Customers have already prevented utility disconnection and also triggered automatic-reconnection of services as well using real-time payment that posts to their account in under two seconds. Our city benefits internally from this hybrid solution by leveraging our internal resources more efficiently while extracting the cost-effective advantages of the scalable, maintained, and monitored Microsoft Azure platform.