

CreditCardXpress[™] Executive Overview

CFXWORKS, INC 2015

http://www.cfxworks.com

CreditCardXpress™ Executive Overview

CreditCardXpress ®

A payment card solution for small to medium size businesses that supports Elavon*

(* formerly NOVA Information Systems)



Executive Overview

Software Version	16.1
Document	CCX_Executive_Overview.pdf
Published	10/12/2010
Updated	02/08/15

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Printed in the United States of America.

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1. Background

For over 16 years CFXWorks has been developing security solutions that support encryption, digital signatures and secure messaging technologies. Our solutions targeted "data-at-rest" and "data-in-flight" data confidentiality and data integrity requirements in cross platform environments involving Windows, Linux, UNIX (Solaris, AIX and HPUX) and IBM's iSeries platforms. In year 2000, CFXWorks began developing payment card gateways. We have developed and shipped credit card gateways that support: Elavon, Vital, Paymentech, Authorize.Net and Bank of America's VirtualPay.

We have over 500 users of our payment gateways. Our customers include merchants from various sectors of business including: retail, wholesale, manufacturing, education, government (state and local), legal and insurance.

Our CreditCardXpress solution is built using our NovaXpress SDK product which we originally developed and certified in year 2000. We have enhanced and updated this offering over fifteen times to keep pace with new customer requirements, changes by Elavon and changes required to address new Payment Card Industry Data Security Standards (PCI DSS) requirements. Each new version of CreditCardXpress is recertified using Elavon's certification process.

For your convenience, Appendix A contains definitions for a number of terms and acronyms that are used in the credit card industry.

The following documentation is available from CFXWorks:

- CreditCardXpress Executive Overview
- CreditCardXpress Fast Path Instllation Guide
- CreditCardXpress Administration Guide
- CreditCardXpress User Guide
- CreditCardXpress Convenience Fee Guide
- CreditCardXpress Marketing Guide
- CreditCardXpress Offering Comparison
- CreditCardXpress Offering Levels

2. MERCHANT'S REQUIREMENTS

Over the last eight years CFXWorks has had the opportunity to talk with hundreds of merchants. A common thread among many merchants was their dissatisfaction and frustration with 3rd party payment solutions. Their dissatisfaction and frustration was focused on the following issues:

- Excessive 3RD party processor fees
- Hidden 3RD party processor fees
- Perormance, reliability and security issues related to 3RD party processors.
- Lack of access to and control over transaction data
- Inability to create customized reports
- How to implement the Payment Card Industry Data Security Standards (PCI DSS)
- Lack of support from their vendors and processor

Merchant Account

When a merchant establishes a "merchant account" they can do it directly through a processor, for example Elavon, or they can do it through a middleman referred to as a 3rd party provider. 3rd party providers are typically resellers of a processor's services. They may or may not have their server in the transaction processing pipeline. If they have their server in the pipeline, then they must relay transactions received from the merchant to the processor through their servers.

When dealing directly with the processor (for example Elavon):

- The merchant negotiates directly with the processor to establish their merchant account and all aspects of the fee structure assigned to the merchant account.
- No middlemen are involved in negotiating this relationship.
- No middlemen are involved in processing transactions. Transactions are sent directly from the merchant's server to the processor.
- There are no middlemen fees or hidden costs in this environment because there are no middlemen.
- There are no performance, reliability or security issues caused by middlemen because there are no middlemen in the pipeline.
- CreditCardXpress solution is designed specifically for this environment.

When dealing with a middleman 3rd party processor:

- The merchant negotiates with the 3rd party processor to establish the fee structure. In this scenario all transactions are ultimately passed to the processor! If this is the case then who pays the processor? Who pays the 3rd party? Ultimately the merchant must pay both the "processor" and the "3rd party processor". This being the case, the merchant should carefully consider what additional services are provided by the 3rd party to justify the added cost.
- In most 3rd party processor situations, transactions are sent first to the 3rd party processor's system and then relayed to the processor. This introduces one more point of failure in the pipeline and may create issues related to performance, security, and of course fees.
- When problems arise who's at fault? Does the issue lie with the "3rd party" or the "actual processor"? With these two entities pointing their finger at each other, the Merchant can be left in a rather precarious situation. Meanwhile, until the issues/problems are resolved the merchant is losing sales as well as potential future customer relationships.
- This is NOT the CreditCardXpress environment.

Other issues that may surface when using a 3rd party processor are:

- **Delayed receipt of funds** a processor, for example Elavon, automatically settles the merchant's account every night. Therefore, the funds are deposited in the merchant's banking account the next day. A 3rd party processor may remit payments only once or twice a month.
- **Risk of non-payment** Since the 3rd party delays payment for some period of time (sometimes several days), the merchant is exposed to loss if the 3rd party is not financially sound.
- Chargeback risk Customers are far more likely to dispute charges on their credit card statements that do not clearly identify the source of the charge. When a merchant account is established directly with the processor, the merchant's organization name and telephone number will typically be displayed on the customers' statement. Charges processed via a 3rd party will typically have the 3rd party's name, which is often not relevant to the cardholder. Often, customers will simply call their credit card company and dispute the charge. This is likely to result in extra charges (called Chargeback fees), as well as extra work for the merchant and the customer that may result in your loss of the sale.
- *Less information about customers* Typically the online forms used by 3rd party processors are very generic and don't allow the merchant to collect additional information about the customers that could be helpful in future solicitations and customer development.

• *Higher costs* - Typically 3rd party processors charge higher transaction processing fees, often 5 to 10 percent of the sale amount vs. the 2 to 3 percent you will incur if you negotiate directly with the processor. They may also hide a significant portion of their fees in what is commonly referred to as "*hidden fees*". Hidden fees relate to monthly, quarterly and annual fees buried deep within the agreement signed by the merchant. For the unsuspecting Merchant these hidden fees can really add up quickly and bite into their bottom line.

Transaction processing fees can add up quickly even if the additional fee is only a few cents per transaction. A review of *Figure 1* reflects how a merchant's processor fees can add up rather quickly.

Amount Lost Each Year							
	vendor fees per transaction						
Number of transactions	5 cents	10 cents	15 cents	20 cents			
1,000	\$50	\$100	\$150	\$200			
10,000	\$500	\$1,000	\$1,500	\$2,000			
100,000	\$5,000	\$10,000	\$15,000	\$20,000			
500,000	\$25,000	\$50,000	\$75,000	\$100,000			
1,000,000	\$50,000	\$100,000	\$150,000	\$200,000			

Figure 1 – Vendor transaction Fees

Note that "hidden fees" should not be taken lightly. They include monthly, quarterly and annual fees charged by both the processor and 3rd party processor. A potential "*hidden fee*", which could be significant, relates to the *fee structure quoted to the Merchant*. The quote may only relate to a best case scenario. For example the quote may apply only to a very low risk transaction scenario (card-present, swipe or full AVS and CVV2). Merchants may choose to accept payment even though the customer does not present certain data as part of their transaction (i.e., AVS and CVV2). Therefore, they end up paying significantly higher transaction processing fees than what they thought they had committed to.

Merchant Requirements

From our discussions with merchants, we created a requirements list which we used as a guideline in developing CreditCardXpress. Here is our list:

- Aggressive Fee Structure merchants want to be offered an aggressive fee structure from their processor with no hidden costs or fees. They also want to negotiate directly (NO 3rd party processor! NO middlemen!) with their processor relative to all processing fees.
- 2. *Next Day Settlement* merchants want transactions settled with funds transferred to their account on the next business day.
- 3. *Reliability* merchants want reliable processing of their transactions.
- 4. *Easy* merchants want a solution that is easy to acquire, install, integrate, maintain, support and use.
- 5. *Scalable Solution* merchants want a solution that can be scaled to meet their needs as their requirements grow without forcing them to make a major investment to redesign, rewrite and redeploy the solution.
- 6. *Processing Speed* merchants want an affordable way to process multiple transactions per minute with less then 3 second latency on a per transaction basis.
- 7. *Single Point of Control* merchants want a single point of control relative to resolving hardware and software issues. A major reason for insisting on "no middlemen" is to eliminate finger pointing when problems occur.
- 8. *Audit Trail* merchants need an audit trail for their own internal purposes as well as to respond to credit card industry regulations.
- 9. *Ownership of Transaction Data* merchants want the ability to retrieve transaction data and/or the ability to store transaction data on their own systems.
- 10. *Export of Transaction Data* merchants want the ability to extract data in many forms, for example in the form of an Excel spread sheet, a Word document, as an Adobe Acrobat pdf file or as a comma delimitated file.
- 11. *PCI DSS* merchants want a credit card solution that is implemented by their vendor consistent with PCI DSS (Payment Card Industry Data Security Standard). PCI DSS

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originally began as five different programs: Visa Card Information Security Program, MasterCard Site Data Protection, American Express Data Security Operating Policy, Discover Information and Compliance, and the JCB Data Security Program. Each company's intentions were roughly similar: to create an additional level of protection for customers by ensuring that merchants meet minimum levels of security when they store, process and transmit cardholder data. A company processing, storing, or transmitting payment card data must be PCI DSS compliant or risk losing their ability to process credit card payments and being audited and/or fined. Merchants and payment card service providers must validate their compliance periodically. This validation gets conducted by auditors - i.e. persons who are the PCI DSS Qualified Security Assessors (QSAs). Although individuals receive QSA status reports, compliance can only be signed off by an individual QSA on behalf of a PCI council approved consultancy. Smaller companies, processing fewer than about 80,000 transactions a year, are allowed to perform a self-assessment questionnaire.

- 12. *Comprehensive Solution* merchants want a solution that can be integrated with their front office, back office, shopping cart, and mail order requirements.
- 13. *Testing Capabilities* merchants want the ability to run test transactions against the processors systems as well as running production transactions.
- 14. *Assistance from their Processor* merchants want to be able to directly call their processor to resolve payment issues related to specific transactions.
- 15. *Services* merchants want to be able to turn to experienced "services providers" who have the expertise to assist them deploy, integrate and manage their credit card solution.

While merchants processing a limited number of transaction with low dollar amounts per transaction tend to focus on only a couple of the above requirements, as their volumes increase they tend to add more of the above requirements to their "must have" list:

3. Target Operating Environment

The first consideration in building CreditCardXpress was to be responsive to the requirements identified in *Section 2* of this document.

Our second consideration was to design and implement a solution that was consistent with PCI DSS. PCI DSS security requirements are so intrusive that implementing them on top of a pre-existing architecture was out of the question. Instead, we pursued a bottoms-up approach building CreditCardXpress on an Identity Access Management (IAM) system to control user authentication and authorization. To be consistent with PCI DSS, we also designed CreditCardXpress so that it could be deployed in an environment similar to the following:



Figure 2 – CreditCardXpress Operating Environment

For a more detailed discussion of PCI DSS please review the CreditCardXpress PCI DSS Guide.

Our third consideration was to design a payment solution that would address the needs of merchants wanting to process "card-not-present" payment transactions using the Internet.

Our fourth consideration was to create APIs for merchants who want to write their own code to integrate CreditCardXpress with their shopping carts and back office systems.

Our final consideration was to implement a robust architecture that would facilitate our ability to add additional capabilities in the future.

4. CreditCardXpress Overview

CreditCardXpress is a software solution that provides merchants the following capabilities:

- CreditCardXpress allows merchants to process payment card (credit, debit, check, purchase and gift cards) transactions using the Internet to connect the merchant's system to Elavon, the fourth largest credit card processor in North America. Elavon processes over a billion transactions annually for nearly a million merchant locations. Elavon is rated the number 1 processing network by MasterCard ® for speed, availability and reliability.
- CreditCardXpress sends transactions directly to Elavon for processing bypassing 3rd party processors. By communicating directly with the Elavon, the merchant eliminates the costs and hassle involved with interacting with 3rd party processors. This also enables the merchant to negotiate their fee structure directly with Elavon rather than with a third party processor who typically adds additional processing and service fees.
- CreditCardXpress has been implemented consistent with the Payment Card Industries Data Security Standards. We use Trustwave as our QSA to perform the necessary source code reviews to verify that our payment solutions are implemented consistent with PCI DSS. The merchant also retains some PCI DSS responsibilities. Our intent is to facilitate and support their efforts to achieve PCI DSS compliance.
- CreditCardXpress provides users a browser based user interface that supports manual entry of payment card transactions. This demo code would normally be tailored by the merchant to fit their specific needs. This demo code is a good fit for "card-not-present" transactions in a mail or phone order environment.
- CreditCardXpress provides a "buy button" interface intended for integration with the merchant's shopping cart. This interface, QuickCharge TM, requires a link from the merchant's shopping cart to enable processing transactions.
- CreditCardXpress supports Elavon's "Host Based" mode of processing and is Elavon certified for market segments "eCommerce", "Retail" and "MOTO". The eCommerce market segment is generally used by merchants wanting to process card-not-present transactions using the Internet. The Retail market segment is generally used by merchants for card-present transactions. The Mail Order Telephone Order market segment is used by merchants accepting orders by mail or over the phone.
- CreditCardXpress supports the following credit and purchase card transaction types: SALE, PRE-AUTHORIZATION, FORCE, CREDIT, and VOID. In addition, for debit cards it supports debit card SALE, CREDIT, CASHBACK and INQUIRY. It also supports the following batch transaction types:

CURRENT, PREVIOUS, PURGE and SETTLEMENT. Several transction types are also supported for gift cards.

- CreditCardXpress supports multiple merchant accounts and multiple Terminal IDs per merchant account.
- CreditCardXpress is built on an Identity Access Management (IAM) base to enforce user authentication and authorization. For example, the merchant's CreditCardXpress administrator assigns users to specific user accounts and assigns each user account a specific role. The role an account is assigned controls what activities and information the user has access to.
- CreditCardXpress supports the following security and quality control features:
 - Elavon certification
 - **IBM certification** for Linux and WebSphere
 - **Data confidentiality features** sensitive data encrypted using the AES algorithm with 256-bit keys and 128-bit initialization vectors.
 - **Data integrity features** selected data is signed using either MD5 or SHA1.
 - Credit card numbers are validated using the LUHN formula (Mod 10).
 - Card numbers (PANs) are masked in all displays and logs
 - Logs implemented consistent with PCI DSS standards
 - Support is included for the Address Verification System (AVS). Full and partial AVS is supported
 - Support is included for CVC2/CVV2/CID.

5. Dependencies

To use CreditCardXpress in **"TEST MODE" the merchant does not need to purchase an Elavon merchant account**. Therefore, the merchant can download CreditCardXpress to their Smart Market platform, have it installed by IBM, run test transactions, and integrate it into their shopping cart before making a purchase decision.

To use CreditCardXpress in "PRODUCTION MODE" the merchant must purchase an Elavon merchant account. We stongly suggest that you purchase your merchant account from one of the following Elavon employees. They are quite familiar with CFXWorks products and are prepared to step you through the process of acquiring your merchant account.

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The contact information at Elavon to establish this account is:

Commercial Accounts: Lewis N. Pergament Relationship Manager Office: (516) 679-5919 Fax: (516) 826-4559 lewis.pergament@Elavon.com Government or Institutional Accounts: Jeremy G. Krahl Regional Manger Office: (865) 693-1231 Fax: (865) 403-5408 Jeremy.krahl@elavon.com

6. Software Appliance

The fourth merchant requirement listed in *Section 2* of this document stated that merchants want a solution that was easy to acquire, install, integrate, maintain, support and use. Most merchants simply don't have all of the skills required to take care of each of these critical steps. With that being the case, how can these objectives be achieved by the Merchant?

Last year Novell launched a SUSE Linux Appliance offering that has been very successful in the Linux market segment. Their initiative is designed to make it easy to acquire, install, integrate, maintain, support and vendor solutions bundled with SUSE Linux. They call these solutions SUSE Linux Software Appliances. CFXWorks is pursuing an agreement with Novell that will lead to our releasing CreditCardXpress and NovaXpress 400 as SUSE Linux Payment Solution Appliances.

7. Resellers and Integrators

Integrators can assist merchants with their payment solution by providing the skills and resources necessary to:

- 1. Design, build and integrate front office and back office capabilities with CreditCardXpress.
- 2. Design, build and integrate features and functions unique to a given Merchant.
- 3. Provide services that achieve maintaining consistency with the PCI DSS standards.

4. CFXWorks maintains relations with several integrators who can assist merchants install, customize and integrate CreditCardXpress with their legacy systems. If you need assistance, please call CFXWorks and perhaps we can assist you find a match.

8. Ten Reasons To Buy CreditCardXpress

- 1. Affordable
- 2. Easy to buy, install, administer, maintain and support.
- 3. Consistent with PCI DSS
- 4. Built on an identity access management system that privides access control and authentication.
- 5. Includes detailed transaction logging capabilities.
- 6. It has a "Buy Button" shopping cart interface designed for merchants who have limited programming capabilities.
- 7. Web interface for users needing to process card-not-present payment transactions.
- 8. Will run on Tomcat or WebSphere Jjava Application Servers.
- 9. Source code has been reviewed by Trustwave to validate that the code is implemented consistent with PCI DSS.
- 10. Certified to Elavons network.

Appendix A - Definitions

Acquiring Bank - An acquiring bank (or acquirer) is the bank or financial institution that accepts payments for the products or services on behalf of a merchant. The term acquirer indicates that the bank accepts or acquires transactions performed using a credit card issued by a bank other than itself.

Annual Fees – Some processors charge merchants an annual fee. This fee typically ranges from fifty dollars per month to about one hundred and fifty dollars per month. It is in addition to the discount rate, monthly fees, quarterly fees and transaction fees paid by the merchant.

AVS - Address Verification System (AVS) is a system used to verify the identity of the person claiming to own the credit card. The system will check the billing address of the credit card provided by the user with the address on file at the credit card company.

Batch - Transactions received during each 24 hour period are accumulated by Elavon in a batch. When the record number for a current batch reaches 950, Elavon will automatically close the batch, increment the batch number, and open a new batch returning a new record number of 001. Normally a merchant elects to have Elavon automatically settle transactions each day. In this case at 2:30 PM EST Elavon "settles" the batch through the banking networks.

Card Association - A card association is a network of issuing banks and acquiring banks that process payment cards of a specific brand.

Card-Present – A payment card transaction where the card is physically presented to the merchant.

Card-Not-Present –A payment card transaction where the card is not physically presented to the merchant. For example a phone or mail order is a card-not-present transaction.

CVV2 - The Card Security Code (CSC), sometimes called Card Verification Value (CVV), Card Verification Value Code (CVVC), Card Verification Code (CVC), or Verification Code (V-Code or V Code) is a security feature for credit or debit transactions, giving increased protection against credit card fraud.

Discount Rate - The fee a merchant pays its acquiring bank/merchant bank for the privilege to deposit the value of each day's payment card purchases. This fee is normally quoted in the range of two to three percent of purchase value. However, the quote is likely to be for a specific type of transaction only under specific conditions. For example it may only apply to "card present" transactions when both AVS and CVV2 are present and verified. Therefore, accepting any quotes

discount rate merchants should verify that the quote fits their specific transaction type and mode of operation.

Elavon – Elavon is the new corporation name for Nova Information Systems. Elavon is the third largest credit card processor in North America. Elavon processes over a billion transactions annually for nearly a million merchant locations. Elavon is rated the number 1 processing network by MasterCard ® for speed, availability and reliability.

IBM Smart Market – Smart market is an IBM initiative intended to provide hardware/software solutions that target the SMB marketplace. This program is unique in that the solutions sold by IBM include IBM hardware and software, a vendor's software, IBM marketing and technical support, IBM electronic delivery, and IBM installation.

Issuing Banks - An issuing bank is a bank that offers card association branded payment cards directly to consumers.

Line of Credit - A line of credit is a credit facility that allows a borrower to take advances, during a defined period, up to the preset limit and repay the advances at the borrower's discretion (with the exception that the entire principal balance plus accrued interest is due on the maturity date.

LUHN - The Luhn algorithm or Luhn formula, also known as the "modulus 10" or "mod 10" algorithm, is a simple checksum formula used to validate a variety of identification numbers including payment card numbers. It was created by IBM scientist Hans Peter Luhn and described in U.S. Patent 2,950,048.

Merchant Account – A merchant account is a contract under which an acquiring bank extends a line of credit to a merchant, who wishes to accept payment card transactions of a particular card association brand. Without such a contract, one cannot accept payments by any of the major credit card brands.

Monthly Fees – Some processors charge merchants a monthly fee. It probably is reflected on the merchants account statement as "Other Fees". This fee typically ranges from a couple of dollars per month to about thirty dollars per month. It is in addition to the discount rate, quarterly fees, annual fees and transaction fees paid by the merchant.

Payment Card - Typically a payment card is backed by an account holding funds belonging to the cardholder, or offering credit to the cardholder. Payment cards can be classified into types depending on how this account is managed. CreditCardXpress supports credit, purchase and debit cards. In the future gift card capability will be added to CreditCardXpress.

PABP – Payment Application Best Practices (PABP) is a set of recommendations developed by Visa to assist software vendors create secure payment applications that help ensure merchant compliance with PCI DSS.

PCI DSS – The Payment Card Industry Data Security Standards (PCI DSS) - PCI DSS is a set of requirements for enhancing payment account data security. It was developed by the founding payment brands of the PCI Security Standards Council, including American Express, Discover Financial Services, JCB International, MasterCard Worldwide and Visa Inc. Inc. International, to help facilitate the broad adoption of consistent data security measures on a global basis.

Payment Processor – an organization like Elavon that offers payment processing solutions.

Processor - A processor **authorizes** and **captures** payment card transactions and submits these transactions to the bank system gateway that links the processor to the banks. The submission of transactions to the bank system gateway results in the transfer of funds for the customer's account to the merchants account.

Production Mode of Operation – A user of CreditCardXpress can choose to run test transactions or production transactions. Production transactions are added to the current production batch and are settled following each business day. Production transactions normally result in the transfer of funds.

Quarterly Fees – Some processors charge merchants a quarterly fee. This fee typically ranges from a couple of dollars per month to about fifty dollars per month. It is in addition to the discount rate, monthly fees, annual fees and transaction fees paid by the merchant.

Test Mode of Operation - A user of CreditCardXpress can choose to run test transactions or production transactions. Test transactions are added to a current test batch and are not settled. Test transactions are used to test connections and for training purposes. Test transactions never result in the transfer of funds.

Terminal ID – To use CreditCardXpress in a production mode each merchant must establish an account with Elavon (see Section 3 of this document). Elavon assigns to each merchant a Merchant ID (MID), one or more Terminal IDs (TIDs) and a Bank Identification Number (BIN) for identification purposes.

TID File – This is an encrypted file created by CFXWorks and sent to the merchant that contains the authorized Terminal IDs and BIN numbers.

Transaction Fees – Some processors charge merchants a fee for each payment card transaction. This fee can range from a few cents to perhaps as high as thirty cents per transaction. It is in addition to the discount rate, monthly, quarterly, and annual fees paid by the merchant.

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