

NonStop Supports Individual Preauthorization of Latin-American Payment Cards

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Transparent to most of us, an incredible number of validation checks take place on each transaction that we make with one of our credit cards or debit cards. Not only must a card be active and the transaction not exceed the card limit or account balance, but restrictions may also extend to certain countries, retailers, transactions, and even point-of-sale (POS) terminals.

Payment Card Preauthorization

A transaction must pass such preauthorization checks before the bank issuing the payment card continues its process of determining whether to authorize the transaction or not. It is a process that may include a further step of fraud detection.

Preauthorization can be so compute-intensive that it is often performed by a separate system acting as a front end to the issuing bank. The financial-transaction switch that routes transactions from transaction sources (POS devices, ATMs, the Internet, and other financial-transaction networks) to the issuing banks is an ideal platform to provide preauthorization services as it can do preauthorization for all of the issuing banks that it serves.

Preauthorization services are made available in the financial-transaction switch of the largest supplier of transaction-switching services in Latin America, PROSA (<http://portal.prosa.com.mx>). Using the OmniPayments preauthorization engine from Opsol Integrators Inc., transactions received for routing to an issuing bank are first tested by PROSA's switch against the bank's preauthorization rules. If a transaction passes these tests, the switch routes it to the issuing bank for authorization. If a transaction fails the tests, the switch returns a reject indication to the terminal that originated the transaction. The issuing bank is not encumbered by having to process the rejected transaction.

PROSA

PROSA provides routing, authorization, clearing, and settlement services for electronic transactions. As the largest supplier of electronic-transaction switching services in Latin America, PROSA manages 200,000 POS terminals and its own large ATM network. It handles 200 million card transactions per month for over 70 million cardholders.

PROSA serves most of the banks in Mexico. Of the approximately fifty Mexican banks, the PROSA network is used by forty of them. It also serves other international banks in Latin America, including those in Brazil, Guatemala, El Salvador, Colombia, Panama, Honduras, Peru, and Puerto Rico.



Individualized Preauthorization

Preauthorization validation rules are established by issuing banks, with each bank setting its own set of rules. The rules

are published in PROSA's preauthorization engine to filter out transactions that will not be processed no matter the status of a card or a cardholder's account. These are transactions that the issuing bank never has to see.

This capability is now being extended by PROSA to individual card holders and to other interested parties. For instance, a business owner can establish charge limits for company cards he issues to employees. He can restrict how much each employee can charge for meals, hotels, cars, and airfares. Executive-level employees may have different limits than other employees, or an employee who is tasked with a great deal of travel might have higher limits.

Families can establish preauthorization rules for their cards. A father might set daily or weekly limits on the amounts that each of his children can charge. He can limit the use of a child's card to certain merchants or certain items. He has the ability to restrict the items for which a card can be used, such as prohibiting the purchase of cigarettes or alcohol. He can restrict the times and days that a card can be used. For instance, perhaps a son's card will be authorized for use only on weekend evenings between 5 PM and Midnight.

Likewise, merchants can set limits on transactions entered into their POS terminals. A daily or weekly maximum limit may be established for any one card or cards to prevent their overuse in the merchant's business. A minimum limit may be established to prevent the payment of transaction fees on very small transactions. Manual entries may be prohibited – if a card's magnetic stripe cannot be read, the card becomes unusable.

PROSA's Financial-Transaction Network

The PROSA financial-transaction network routes Latin American credit- and debit-card transactions for authorization to the issuing banks. Originally based on ACI's BASE24 financial-transaction switch, the switching network offers preauthorization services to its bank customers.

Card transactions originating at ATMs or at POS terminals in retail establishments are captured by the acquiring banks that manage the ATM or POS-terminal networks. If an acquiring bank is not the issuing bank, it transmits the card request over the financial-transaction network to the bank that issued the card. If an issuing bank takes advantage of PROSA's preauthorization services, its card transactions are passed through the switch's preauthorization module. The transaction will be rejected if it fails any of the preauthorization tests specified by the issuing bank. Only those transactions that pass the preauthorization rules are forwarded to the issuing bank.

Once a transaction has passed the preauthorization rules, if any, the issuing bank may authorize or deny the transaction based on various parameters to which it alone is privy, such as available

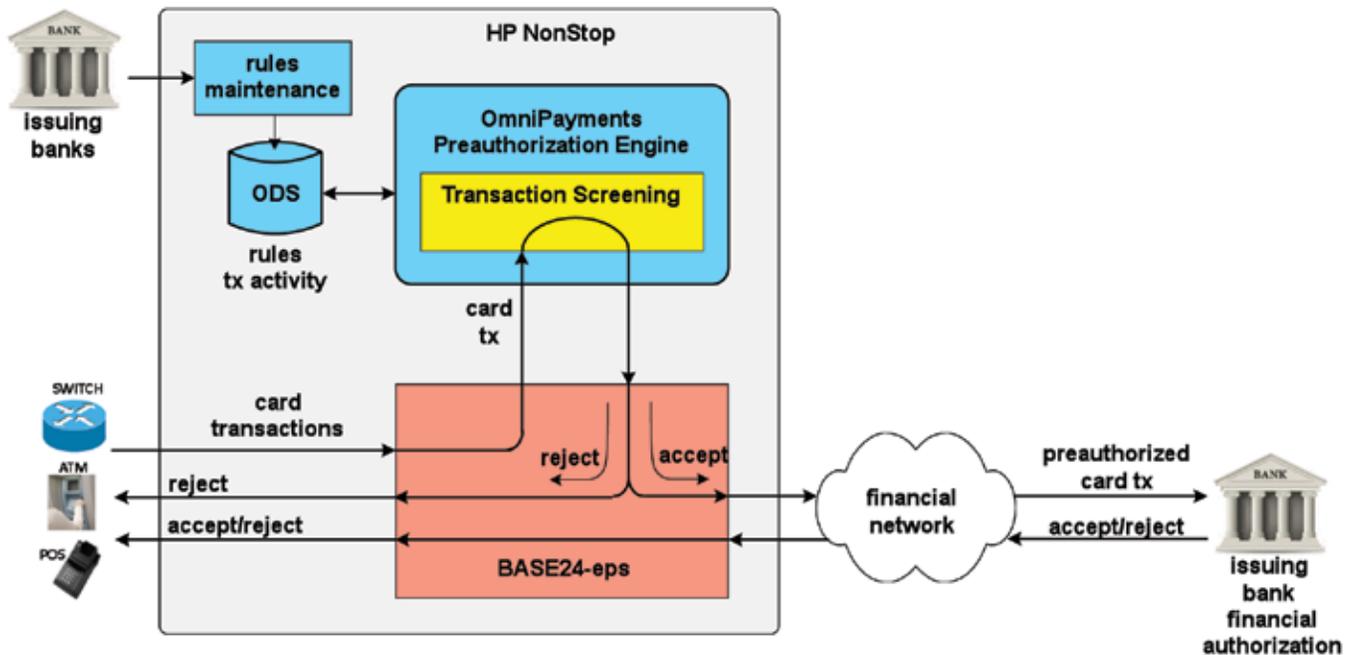


Figure 1 – OmniPayments Preauthorization Engine

credit and usage history. This determination is returned to the ATM or POS terminal via the financial-transaction network to complete or to void the transaction.

At the end of each day, PROSA sends all completed merchant transactions to the acquiring and issuing banks for settlement and clearing.

The Move from BASE24 to BASE24-eps

When ACI announced the end-of-life for its NonStop BASE24 product, PROSA had to upgrade to ACI's new BASE24-eps financial-transaction switch. This entailed the rewrite of hundreds of special modules created by PROSA for its original switch.

One of these modules was the preauthorization module. This module had become extremely large and complex. Moreover, PROSA wanted to significantly extend the preauthorization rule set that it offered its customers. Therefore, it decided not to rewrite the module for BASE24-eps. Rather, it moved this function to the OmniPayments Preauthorization Engine. The integration of the OmniPayments Preauthorization Engine with BASE24-eps is shown in Figure 1.

Each transaction routed to an issuing bank must be validated against an often intricate set of rules before its execution can be authorized. Preauthorization consumes valuable processing resources of the authorizing bank and requires the continual maintenance of authorization rules and parameters. OmniPayments provides preauthorization services via its Transaction Screening Module to fulfill this need and to remove much of the authorization complexity from the issuing banks. It is the responsibility of the OmniPayments Transaction Screening Module to prescreen a transaction before it is sent to the authorizer.

Each issuing bank establishes its own preauthorization rules. These rules can be set up initially via bulk file transfer, and they can then be maintained via a browser interface provided by OmniPayments. The rules are stored in an Operational Data Store (ODS) and are used by the OmniPayments Preauthorization Engine.

Many of the preauthorization rules depend upon card activity. For instance, a particular card may be limited to the number of times that it can be used in one day. Therefore, the Preauthorization Engine also uses the ODS to record card activity.

The BASE24-eps switch routes all financial transactions to the Transaction Screening module of the OmniPayments Preauthorization Engine prior to submitting the transactions to the issuing banks for final authorization. The Preauthorization Engine applies an issuing bank's pertinent rules to each of its incoming transactions. If the transaction satisfies the rules, the Preauthorization Engine returns an "accept" indication to the BASE24-eps system. This allows BASE24-eps to forward the transaction to the issuing bank for financial authorization. If the transaction passes the financial tests of the issuing bank, the bank returns an "accept" indication to BASE24-eps, which forwards it to the initiating ATM, POS, or financial-transaction network to allow the transaction's completion. If the issuing bank denies the transaction, the bank will return to BASE24-eps a "reject" indication, also to be forwarded.

On the other hand, if the Preauthorization Engine determines that the transaction violates one or more of the issuing bank's rules, it will return a "reject" indication to BASE24-eps directly, which will send it to the transaction source to abort the transaction. The transaction will not be forwarded to the issuing bank for authorization.

OmniPayments Transaction Screening

The OmniPayments Transaction Screening preauthorization rules can be quite complex. For instance:

- The card must represent a valid issuing institution.
- The card is current and has not been lost or stolen.
- The retailer and terminal are valid and have not been blocked.
- Certain country codes, zip codes, merchant categories, issuing-institutions, card types, and transaction types can be restricted.
- The day, date, and time during which a transaction is made can

be limited by merchant, institution, terminal, card prefix, and card account number.

- PIN transactions, signature transactions, ATM transactions, and POS transactions can all be controlled.
- Manually entered transactions can be restricted.
- The transaction amount and the number of transactions are checked against the minimum and maximum daily, weekly, biweekly, and monthly limits for the institution, merchant, terminal, and card.
- The transaction amount falls within the card's limits.
- Sufficient funds are in the account to cover the transaction.

As can be seen from the extensive rule set described above, the authorization of transactions is defined by a large Rules Database. The Rules Database involves a number of databases for Prefixes, Institutions, Negative Cards, Positive Cards, Transaction Codes, Retailers, and Terminals. Each transaction type can be configured to use its own set of rules that can vary between issuing institutions, merchants, and even terminals. OmniPayments offloads from issuing institutions the significant task of checking a transaction against the Rules Database. It does so with its powerful Transaction Screening engine that allows rules to be easily created and maintained.

Individual Preauthorization Rules

Until recently, PROSA's preauthorization rules applied only to issuing banks; and the banks set up their own rules with the OmniPayments preauthorization engine. The situation now has grown more complex since individuals will be establishing their own rules for cards. This includes family members, employers, merchants, and anyone else interested in taking advantage of PROSA's new preauthorization service.

How do these groups set up their own rules? They do so by working with their issuing banks – the banks that issued the cards on which restrictions are to be placed. Individuals, merchants, and others must contact their issuing banks and specify the various rules that they would like to establish for their cards. The issuing banks will then update PROSA's Rules Database with the individuals' rules.

Typically, a fee is charged for individual preauthorization services. Part of the fee covers the setup and maintenance costs of the issuing banks, and part of the fee is a processing fee for the switch provider, who is responsible for the preauthorization.

The Benefits of Preauthorization

The authorization of transactions is a complex process based on a large Rules Database. Not only must rules be established for a variety of entities, but they must be maintained.

The PROSA network offloads this significant task from the issuing institutions with OmniPayments' powerful Transaction Screening engine. The preauthorization rules used by the Transaction Screening engine are easily created and maintained by the issuing banks. Specific rules can be provided for different issuing banks, different merchants, and different individual cards. Procedures for establishing rules for the issuing banks are consistent across all institutions, easing the manual effort to keep the rules up-to-date and error-free.

What is OmniPayments?

The OmniPayments financial-transaction switch (www.omnipayments.com) is a product of Opsol Integrators Inc. (www.opsol.com). The switch's architecture is illustrated in Figure 2. OmniPayments is a layered architecture and is built upon the fault-tolerant HP NonStop server. All processes are persistent and are automatically restarted should they abort. All database functions such as logging, card parameters, and others are maintained by the NonStop SQL/MP relational database.

The OmniPayments architecture is based on the modern Service Oriented Architecture (SOA). SOA enables new functionality to be easily added to OmniPayments to meet specific needs of its customer banks.

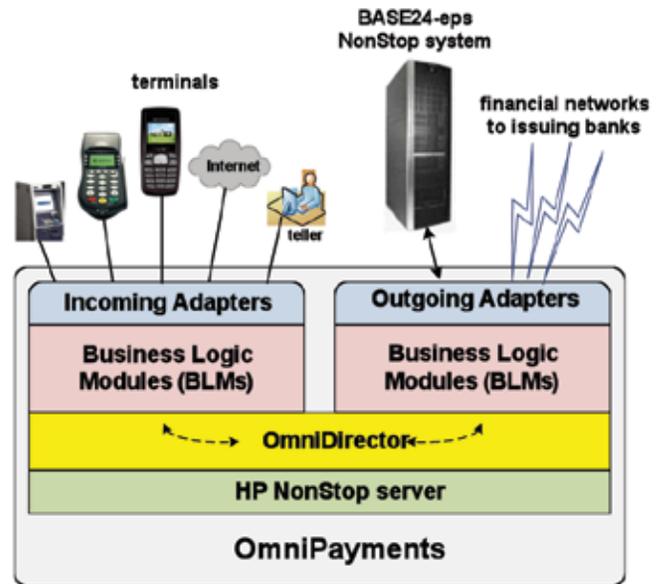


Figure 2 – OmniPayments Financial-Transaction Switch

The core layer of OmniPayments is Opsol's OmniDirector Enterprise Service Bus. OmniDirector services include data transformation, encryption, intelligent routing, and communication-failure recovery. OmniPayments also provides adapters to support the protocols required to communicate with terminals, with the BASE24-eps system, and with other card-interchange networks.

Business logic modules, or BLMs, supply the business functions of OmniPayments. Each BLM is tasked with providing a specific service. For instance, BLMs were written to support the rules functionality needed for preauthorization.

OmniPayments provides complete logging of all transactions. The logs contain the transaction information needed at the end of each day for clearing and settlement.

OmniPayments provides complete security solutions for every financial transaction that it handles, including encryption-at-rest and encryption-in-flight. Available around the clock, OmniPayments will survive any single fault, requires no downtime for maintenance or upgrades, and supports a range of disaster-recovery solutions.

OmniPayments includes a settlement batch-processing module that reconciles transactions between parties at the end of each day. Other modules include OmniCrypto and OmniDash. OmniCrypto handles all security functions,

including PINs, key exchanges, and encryption/decryption. OmniDash is a digital dashboard and administration console that allows a customer to configure OmniPayments and to display drill-down, real-time message-flow statistics and system status via tabular and graphic displays.

Opsol Integrators

With successful implementations at many customer sites, OmniPayments is just one member of the Opsol family of solutions for the financial industry. Opsol Integrators specializes in NonStop mission-critical applications and is HP NonStop's largest system integrator.

Summary

When ACI ended support of its NonStop BASE24 financial-transaction switch, PROSA, the major Latin-American financial-network provider, was required to migrate to ACI's new product, BASE24-eps. Because of the complexity of its BASE24 preauthorization module, PROSA decided to move that function to an OmniPayments Preauthorization Engine. Both BASE24-eps and OmniPayments run in NonStop servers for continuous availability of services.

Initially, the capability to establish preauthorization rules was limited to the issuing banks. PROSA is now extending this service not only to the issuing banks but also to other interested parties such as merchants, employers, and families. This provides a valuable service for individual control of credit cards and debit cards - control that was previously unavailable. [↪](#)

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