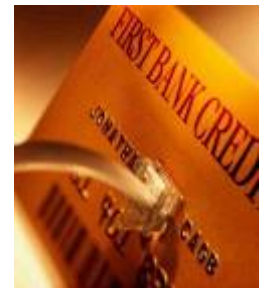


## Update Bulletin

### Resiliency Architecture Enhancements for Connected Payments

May 19, 2008

MTXEPS and StoreNext have improved the Connected Payments resiliency architecture<sup>1</sup> continuing to advance the system, and additional enhancements will be cut in over the next few weeks. In particular, the redundancy process to handle processor and other outages will be made transparent to clerks and shoppers.



Although the current process maintains the necessary security and provides all the redundancy functions, users can get confused by the new lane-based architecture. Store personnel are used to payments being either “up” or “down” across the entire store. But since Connected Payments is lane-independent, one lane could get a time-out/decline from one data center while the next lane over is behaving normally via the alternate data center. The declined lane would retry successfully, but then a third lane could need to retry after its own initial time-out/decline.

In other words, it’s working right but it might not look that way. So we’re improving this aspect in the near-term updates.

#### CONNECTED PAYMENTS RELEASE 128

Recent stoppages at three different processors demonstrated that – although no money, data or transactions have been lost – enhancements will eliminate or reduce confusion, time-outs and retries. In approximately two weeks, the Connected Payments data centers will be live with release 128, providing these enhancements:

- The data centers will provide additional status information to the stores so that the lane can take immediate action. For example, if the data center cannot process a transaction, the POS will be instructed immediately to send transactions to the other data center without having to wait for a time-out.
- The PIN pad will normally display a status explanation or re-try instructions.
- Depending on the problem, the lanes will have predictions how long to send transactions to the alternate data center. This will eliminate or reduce re-occurrences of time-out/declines during the same outage.
- These enhancements require OpenEPS 825 in the lane.<sup>2</sup> The upgrade will be performed from the data center so that dealers do not have to visit the store. However, Connected

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<sup>1</sup> The Three R’s of transaction processing: **Replication** – providing duplicate components to avoid a single point of failure. **Resiliency** – how the system adjusts during a failure to ensure ongoing processing. **Recovery** – how the system returns to normal mode when the failed component is addressed. This all adds up to “Redundancy.”

<sup>2</sup> The 825 version is being generally released for use with Connected Payments – the full 825 WinEPS is still in the customer trial phase.

Payments Support will work with the dealer to schedule the upgrade so that no one is blind-sided.

- A major security advantage: OpenEPS 825 can encrypt transactions from the moment of swipe at the PIN pad to the terminal. This means that all payment transmissions are encrypted throughout the entire enterprise. The feature currently supports Verifone Everest Plus and Omni 7000 PIN pads – the Hypercom L4100, L4150 and L4250 will also support this feature (planned July) as will the Verifone MX series (planned June).

## CONNECTED PAYMENTS RELEASE 129

In mid-July, Connected Payments 129 will go live in the data centers and add further sophistication. The objective is that processor or data center outages will be transparent to the stores.

- Data Centers will proactively notify the lanes of any interruptions at that data center.
- Lanes will receive specific codes from the data centers to take the appropriate actions up-front.
- This will eliminate the first transaction being declined – the lane will not go to a data center that cannot process transactions.
- Since all lanes have the same availability data simultaneously, lane-to-lane behavior will also be optimized in synch, eliminating any confusion from that source.
- This will make resiliency operations transparent to the clerks and shoppers, including off-line stand-in when necessary.

## OTHER REDUNDANCY ARCHITECTURE ENHANCEMENTS

- First Data recently suffered an outage due to a router hardware failure. Although this was addressed in fifteen minutes, First Data has decided to replicate their router setup and will be installing a second set of hardware.
- First Data is also installing additional leased lines. Combined with the new routers, this will enable communications to First Data via the Qwest, ATT, Verizon or Sprint networks.
- Related: two other processors recently suffered internal outages when their hosts failed to switch to their backup processing centers. The problems have been diagnosed and both processors have moved to fix their communication issue.

## INTERRUPTIONS ADDRESSED

Although research has confirmed that no transactions, data or funds have been lost or compromised by switch-overs or service interruptions, better resilience and transparency will certainly enhance in-store operations.

- Processor-specific outages – the past three weeks have seen four or five interruptions specific to individual processor operations. Obviously, Connected Payments itself cannot keep a processor's host up and running, but the enhancements made internally by these processors combined with the resiliency enhancements already made or scheduled in Connected Payments would have prevented all in-store impact from any of these problems.



- Disk or data system malfunction – architecture changes already in place ensure that this type of problem (as experienced for about 15 minutes in April) will not cause a time-out at the store. Additional scheduled changes will make any such problems invisible to the store.

## KEEPING CAPABILITY AHEAD OF CAPACITY

New stores are being added rapidly: about 250 additional stores connected and went live in the data centers just in the past 30 days. However, the server architecture in the Connected Payments data centers is optimized for scaling, so that additional horsepower can be added to any of the data center functions Lego-style without software changes or operational risk.

The Connected Payments data centers have never experienced any capacity-oriented problems. This is because incremental processing power is installed in the data centers whenever the standard processing load reaches about 35% of capacity. This policy ensures that just one of the data centers can process all transactions from the installed base with about 50% additional headroom to handle activity spikes without compromising response times.

Based on the projected install rate, a major hardware addition will be installed the week of May 19<sup>th</sup>. The new server technology uses RAID6 and stripes data across an array of 48 high-performance enterprise drives. In combination with further planned hardware extensions, this will provide capacity to handle more than 3,500 transactions per second, sufficient for the next 5,000+ stores.

