CASH TRANSACTIONS IN A MOBILE WORLD

A TECHNICAL OVERVIEW

Introduction

For two decades, the PC has reigned supreme over POS solutions, operating as point of sale terminals that sit on counters and control various peripherals. However, the need for PC-centric solutions is waning as a more flexible POS model emerges. Leveraging cloud and mobile technologies, this model supports thin client and IP-enabled components such as cash drawers and printers, and isn't locked into a specific operating system.

The new model is more affordable and manageable, and significantly improves the shopping experience. It's a mobile world, after all, and tying the cash drawer to fixed POS stations no longer works in settings where retailers want to offer the convenience of completing transactions at the "point of decision" — literally the place in the store where the customer gets the item and makes the decision to purchase — instead of making shoppers stand in line at a counter.

Key to this model is the implementation of POS systems with agnostic components that eschew proprietary technology in favor of a universal, industry-standards approach. For instance, standalone, IP-enabled cash drawers provide the same functionality and flexibility regardless of operating system, be it Win8, Android or iOS. Such components offer easy implementation and configuration, opening opportunities to integrators and ISVs looking to offer thin, mobile systems to their clients.

From Cash Registers To PCs

In the early 1970s, computerized POS solutions started replacing the cash register, a 19th Century invention that is now more likely to reside in a museum than a store counter. In the 1980s, IBM introduced proprietary PC-based solutions. Early POS solutions were ROM-based systems created by NCR, DTS, and IBM with touch buttons that replaced cash register keys. In the early 1990s,

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APG CASH DRAWER®

the first Microsoft Windows-based POS system entered the market and kicked off a POS revolution.

Numerous POS applications and solutions followed, introducing new levels of customization and functionality specific to the needs of retailers, (big-box, specialty, boutique or mom and pop,) and hospitality (QSR, table service and fine dining). At the center of the typical POS solution is a fixed PC-based station equipped with a cash drawer. The station controls various wired peripherals — printers, barcode scanners and payment card readers — connected to dedicated ports on the POS station through serial or USB interfaces.

The PC for years has remained at the center of the solution, effectively serving as a computerized cash register and controlling the various peripherals. In multiple-workstation environments, POS stations connect to a server at the backend. These typical setups can be costly, especially for smaller retail shops, and in some cases require a fair amount of configuration.

POS Game Changer
Today, a tablet revolution is taking place, with the Android, iOS and Win8 operating systems leading the way. The days of the "fat client" PC-centric POS solution are numbered, thanks to cloud computing and the increasing capabilities of mobile devices such

as tablets and smartphones. A recent Boston Retail Partners study found retailers view mobility as a priority, with 52 percent planning to implement a mobile POS solution within two years. Another 19 percent said they plan to deploy mobile solutions in two years or more.

Thanks to the Internet, consumers are accustomed to shopping in the convenience of their own home, and they want convenience at retail locations as well. Retailers realize they can and need to improve the shopping experience by leveraging cloud and mobile technologies. Why make customers queue up at a counter when you can complete a transaction at the point of decision? For example, a sales associate can initiate a transaction on a tablet in a dressing room, accept a credit card or cash, and complete the sale at a strategically placed cash drawer for a mobile checkout experience. Using the tablet, the associate can complete the transaction and print or email the receipt. Shoppers who enjoy convenience and

speed leave the store happier and are more likely to return for future purchases.

This level of convenience and flexibility is hard to achieve with a POS system constrained by fixed workstations. If components such as cash drawers, printers, and barcode readers are IP-enabled and communicating wirelessly, there's nothing stopping a merchant from offering this kind of flexible service. Store clerks can run transactions from thin-client tablets or smartphones. Where required, security cameras and digital signage displays can be integrated into the POS system, creating a compelling and secure customer experience

POS systems with thin clients and IP components aren't for every setting. Big-box retailers, category killers and supermarkets will continue to need fixed checkouts, but they can leverage mobility in specialty departments, such as shoes, electronics or specialty wine/cheese. In boutique and specialty shops, where a lot of interaction takes place between clerk and patron, this new model is sure to gain traction.

Affordability And Familiarity

The new, thinner POS model is a viable alternative for deploying fully functional POS systems that are far more cost-effective than the traditional POS. Though prices vary, a typical "fat client" POS workstation costs around $3,000. A five-unit rollout would cost $15,000, a hefty price tag for a small retailer.

In comparison, a five-unit deployment with $400 tablets costs under $2,000, and the units are easier to use and have a lower replacement cost. Of course, components such as cash drawers and printers carry their own price tags, but being IP-enabled, fewer are needed because they can be shared. Assuming two IP printers and cash drawers are deployed, the cost of the same five- "station" POS system would be closer to $3,000.

Besides lower costs, IP-enabled POS systems have another advantage — familiarity. Users of tablets and smartphones require less training for similar devices in the workplace. Furthermore, a mobile POS lets retailers stand out from the competition by improving the shopping experience, translating to higher customer loyalty.

The Right Partner

A new POS model, "Thin-bility" is emerging. It combines thin client, mobile and cloud-based technologies to deliver affordable, scalable, reliable, and secure solutions for flexible, convenient shopping. As merchants, restaurateurs and hospitality operators become attuned to the model and its benefits, they start demanding Thin-bility systems from their suppliers. Integrators and ISVs that cannot support the model are turning their backs on new business.

Instead, they should be identifying POS devices and vendors that offer maximum flexibility and simplicity in building

systems. One such vendor is APG Cash Drawer LLC, which leads the industry in IP-enabled cash drawer innovation, offering multiple configurations, sizes and colors for use in a range of industries, including retail, hospitality, restaurants and convenience stores.

IP-enabled cash drawers are fundamental to the Thin-bility approach, releasing businesses from their dependence on expensive PC-centric systems and delivering new levels of functionality to any environment where cash transactions take place. APG's fully customizable IP drawers connect to other system components via wireless and wired Ethernet. The APG NetProTM Model 480 series supports WebSocket Protocol and API methods, making the drawers compatible with browser-based applications — a feature tailor-made for retailers interested in managing systems through a web interface.

NetPRO™ cash drawers capture and store transaction data that helps identify security issues and determine if cashiers are properly trained. Programmable features and reporting capabilities in APG's IP-enabled cash drawers create a wealth of recurring-revenue service opportunities for POS dealers, helping them to add value and boost profits.

APG's Agnostic Approach
APG's NetPRO™ line of IP-enabled cash drawers make thin client and mobile hardware architecture a reality, providing an ideal fit for developers and integrators building Thin-bility systems, regardless of the OS environment they use. The cash drawer is a standalone device and acts as a peer to other POS components, such as

tablets, PCs and printers — an approach that differs from the PC-centric model.

NetPRO™ drawers are compatible with wired or wireless Ethernet subnets and may be engaged by any IP-enabled workstation or tablet on the same subnet. Developed as an agnostic device, the NetPRO™ cash drawer is not dependent upon a specific OS. APG designed the NetPRO™ cash drawers to run without a driver by leveraging the TCP (Transmission Control Protocol) Socket facility provided by every IDE (Integrated Development Environment), including Java, Microsoft Visual Studio, iOS/Python, Android and Cold Fusion. This makes installation and configuration a straightforward process requiring no complex integration work, which can bog down POS implementations.

Further, the NetPRO™ cash drawer need not rely on legacy software standards and tools, such as UPOS, which were originally designed to serve the host/peripheral hardware architecture. In fact, when the NetPRO™ cash drawer is deployed in a truly thin setting, OPOS and JavaPOS drivers become cumbersome to implement and to maintain.

When ordering a NetPRO™ cash drawer, developers and integrators can specify a configuration domain or accept APG's default. APG employs TCP Socket protocols

to expose cash drawer functionality. During installation and configuration, when the cash drawer is connected to a subnet, it is discoverable and configurable through the UDP (User Datagram Protocol) transport control. Once the drawer is discovered, depending on the specific needs of their clients, integrators and developers can programmatically assign domain properties to DHCP or static IP, subnet, and gateway or via the APG a Discovery and Configuration Utility.

The NetPRO™ cash drawer uses both UDP and TCP protocols for specific purposes. Cash drawer discovery and configuration are performed via UDP, and cash drawer control (opening, status reporting, etc.) is performed via TCP. Once configured for the environment, the NetPRO™ cash drawer responds to TCP connection requests from POS software through a simple, standard network socket.

Once a TCP connection is established, the POS application can control the cash drawer using a list of instructions in the APG NetLib Cash Drawer Command library. The library consists of a simple, self-descriptive set of commands that enable cash drawer functionality. TCP connections, once established, persist and will ensure a 1:1 connection because the cash drawer is configured to send keep-alive packets that preserve connection status.

Control And Flexibility
By definition, IP-enabled devices can be controlled from any location. This applies to the NetPRO cash drawer,

Mobile POS using an IP Device Framework
WiFi Client - Enabled Cash Drawers and Other Devices
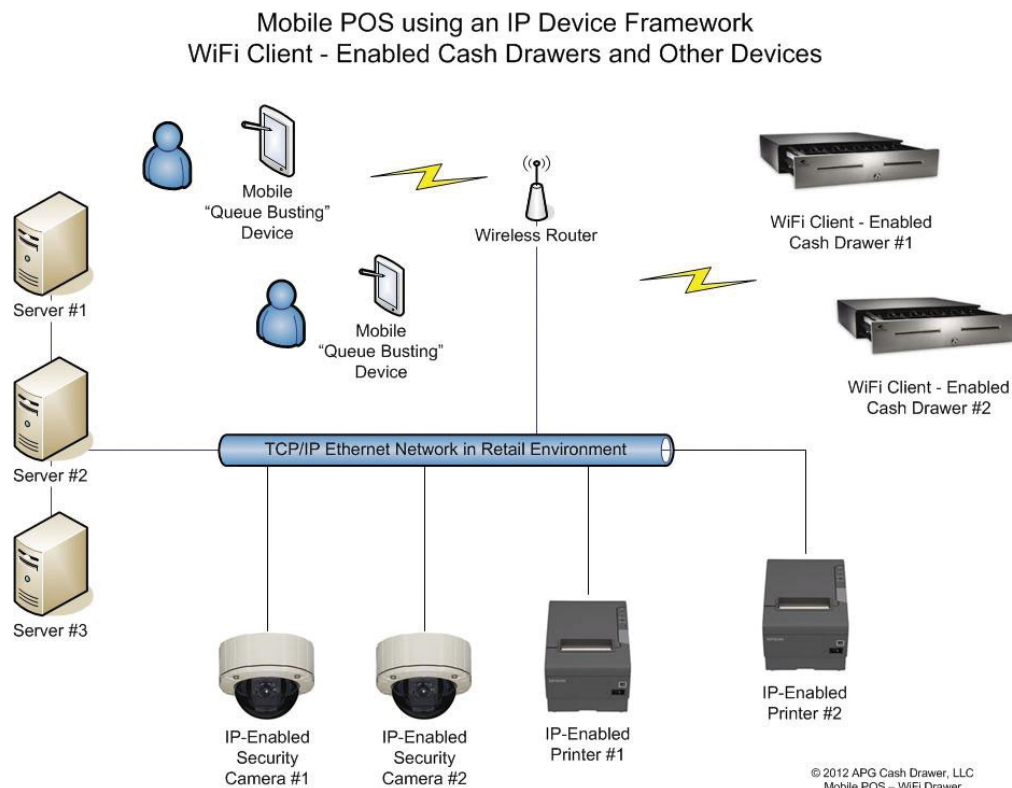
which connects via TCP with other IP devices, including listeners configured to capture exceptional events at the drawer.

Consider a scenario in which the drawer is programmed to open only when a sales associate is nearby. A barcode on the drawer's front panel ensures the associate is in close proximity before opening. When the associate logs a sale on a tablet anywhere in the store, and the customer wants to pay in cash, both must walk to the cash drawer to complete the transaction. The drawer is programmed to open for a predetermined amount of time. If the associate takes too long, the drawer closes on the assumption the associate is no longer nearby. To reopen, the associate must scan the barcode with an ID.

If an associate opens a drawer manually with a key, in contravention of store policy, the system captures the exception for review by managers who can determine if the exception was legitimate or ill-intended. The same goes for when a drawer is unplugged or moved — or if it is opened by someone who is assigned to a different drawer. After reviewing data about exceptions, managers can take appropriate corrective action.

The NetPRO cash drawer can be programmed to issue real-time alerts. For instance, store operators can receive instant email or text alerts when someone opens the cash drawer manually or leaves it open too long. Having instant access to these types of events can help with loss prevention.

Conclusion
The future of POS is mobile and thin. Wherever cash transactions take place, IP-enabled cash drawers linked to other IP components ensure flexibility and convenience. With its agnostic, straightforward approach to implementation and configuration, APG is helping ISVs and integrators leverage this paradigm shift to open new revenue streams and add value.

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About APG Cash Drawer, LLC

APG manufactures a broad range of high-quality cash drawers and other related products for thousands of customers throughout the world. During its 35+ year history, APG has built a reputation as the supplier of choice for highly durable and dependable cash drawers. To learn more about APG products, visit **http://www.cashdrawer.com** or call 763-571-5000.