Re-Thinking IT for Retail:
Wireless Networks and Mobile Applications Take the Lead

A Farpoint Group White Paper

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The retail storefront in principle is simple: provide a location and an inventory of products, advertise, and service consumers as they seek solutions to their individual needs. Given, however, the simplicity of this concept, competitive advantage in retail is increasingly obtained via the application of *information technology*, in the process making the best use of resources, both human and capital, and providing a customer experience that builds trust and loyalty. Key to this objective is *personalization*, a concept that has rapidly matured thanks to the World Wide Web shopping experience, itself fundamentally enabled via advances in IT. Consumers now expect Web-like personal service in traditional retail storefronts, with this requirement often met via the "clicks-and-mortar" strategy being implemented by many successful retailers.

Retailers are consequently investing significant sums in information systems to streamline and enhance branch operations. Ultimately, advances in information technology, and particularly with respect to the application of contemporary wireless and mobile application-delivery technologies, we believe, are the keys to long-term success in retail – the subject of this Farpoint Group White Paper.

Making Retail More Like the Web – Only Better

Beyond local competition, perhaps the most fundamental challenge to retail has come from the Web, now a significant platform for commerce of all forms. In many ways, the Web is simply the evolution of traditional mail-order shopping, only now, instead of filling out and mailing in a paper form, or placing an order via the telephone, consumers comparison shop and then simply point and click to complete their order. While costs can be lower than in the case of a storefront, the primary downside from the perspective of Web-based retailers is perfect knowledge on the part of consumers as to pricing and (usually) availability, resulting in commoditization of the shopping experience. And while most consumers enjoy the information-rich environment of the Web, the inherent limitations of Web-based commerce, including latency in delivery, delivery expense, errors in ordering or fulfillment, the occasional need for and expense inherent in returns, and the occasional disappointing Web-based retailer, place a renewed emphasis on the value of the retail storefront, but not without a new set of expectations on the part of the customer. As we'll illustrate in the next section of this document, consumers are looking for a similar "connected" shopping experience enabled, as is the case with Web-based commerce, via advances in IT for retail.

And the need is clear: we also find that consumers often take issue with many aspects of retail storefronts, including difficulty in finding a particular item (especially in larger stores), finding sales staff knowledgeable in the consumer's requirements and able to provide appropriate advice or assistance, long wait times for help or checkout, and many more. As we'll discuss in the remainder of this Farpoint Group White Paper, advances in wireless-centric networking services - and new applications - can effectively address these issues and bring physical retail more in-line with the advantages of Web-based shopping, yielding the best of both worlds for the consumer.

It's clear at this point, then, is that physical retail stores have a very bright future – if they can combine the best attributes of the traditional retail model, most notably product availability, with wireless-enabled mobility and the information-rich features of Web-based commerce that improve and enhance the consumer shopping experience.

Information-Driven Retail Operations

There are many elements of storefront retail that can benefit from advances in information technology and especially mobile access to information resources, including:

- *Supply chain* – Managing suppliers, inventory, transportation, logistics and many other elements of the supply chain is critical to overall success, and mobility gives branch management personnel the flexibility and convenience required to optimize productivity across the board here.

- *Back office* – While much of IT in retail is centralized in data centers, local processing is in concert with the decoupled and real-time nature of distributed enterprise essential to retail success. We're therefore seeing much more IT functionality resident in the branch, while remaining, of course, centrally managed.

- *Selling floor* – Access to information needed to satisfy a customer inquiry can be provisioned without having to leave the customer's location. In-store collaboration and other communications, including voice, are enabled. Management can have real-time visibility into activities on the floor, and priority and emergency situations can be quickly addressed.

- *Customer experience* – Increasingly, customers are taking advantage of local (and often mobile or at least wireless) retail branch IT capabilities, such as self-scanning of barcodes and kiosk-based information and ordering. Centralized management of and distributed access to customer data is also of obvious value, as data captured on the Web is carried over to the physical store experience. A key element in personalization is the elimination of the need to re-enter information that a consumer has already provided. Connecting to a store's network via a retailer-provided app can accomplish just that, as well as enabling such functions as guidance to the location of a desired item, summoning help from store personnel, accessing informative or instructional videos (with bookmarks for later review), accessing shopping history, providing expedited or automated checkout, checking order status, processing returns, and automating direct-to-consumer shipping for large or out-of-stock items.

As with any enterprise, core objectives in retail include enhancing productivity, building traffic, customer satisfaction and loyalty, and, of course, profitability. Retail will always be typified by a complex set of relationships, involving suppliers, the overall supply chain (transportation, logistics, inventory management, etc.), local branch management

and staff, and, most importantly, the customer. Given that ranking, then, the overall objective of retail IT today must be to support the greater integration of customer-centric IT capabilities into the retail experience, creating a truly *connected customer*.

Mobility and Wireless in Retail: Current Challenges

Despite the obvious inherent and fundamental disadvantages, Web-based retailing is clearly here to stay. As we noted above, a successful storefront retail operation, then, is often defined by the seamless clicks-and-mortar experience, integrating the best of the Web with the clear and sustainable advantages of a storefront. Merging the best of the Web and storefront IT domains is often the first step in establishing this reality.

But there are a number of current barriers to this very desirable future, with the most important of these as follows:

- *Legacy wireless networks* – As we spend a lot of time on mobile and wireless issues here at Farpoint Group, our first observation is that many wireless LAN networks deployed in retail environments today are nearing the end of their useful lives, and an upgrade is likely in order. Systems based on 802.11n typically offer up to *six times* the throughput of 802.11g, and modern enterprise-class systems open the vast expanse of spectrum above 5 GHz. to organizations starved for capacity. Even retail operations that have traditionally limited their wireless activities to barcode-based inventory management and related activities will, we believe, need significant new capacity to handle voice, data, video, location and tracking, and a wide variety of other staff-empowering and customer-facing applications, including many based on the requirement for time-bounded traffic, to enhance the shopping experience – again, bringing the advantages of the Web to the retail storefront.

- *Complex solutions* – Today's branch-resident retail IT solutions are often the result of years of legacy installations coupled with minor upgrades, resulting in a disjoint set of limited-function boxes that are expensive to maintain, hard to manage, and generally unsuited to bringing new information-centric features to the branch (see Figure 1). Many of these products are based on closed architectures, lack flexibility, and will not scale in anything close to a cost-effective fashion. Reliability can be a problem, systems integration challenging, and adaptability to new missions often non-existent. And system and network management, essential if both efficiencies and advanced services are to be realized, is often limited, complex, and far from cost-effective as well.

- *Limited applications* – Because legacy implementations can be so difficult to grow and adapt, adding new applications can be more than problematic – indeed, a re-thinking of branch IT requirements is *required*. But successful retail operations will, we believe, make the investments necessary to improve the shopping experience, and, as has been the case with computers and especially

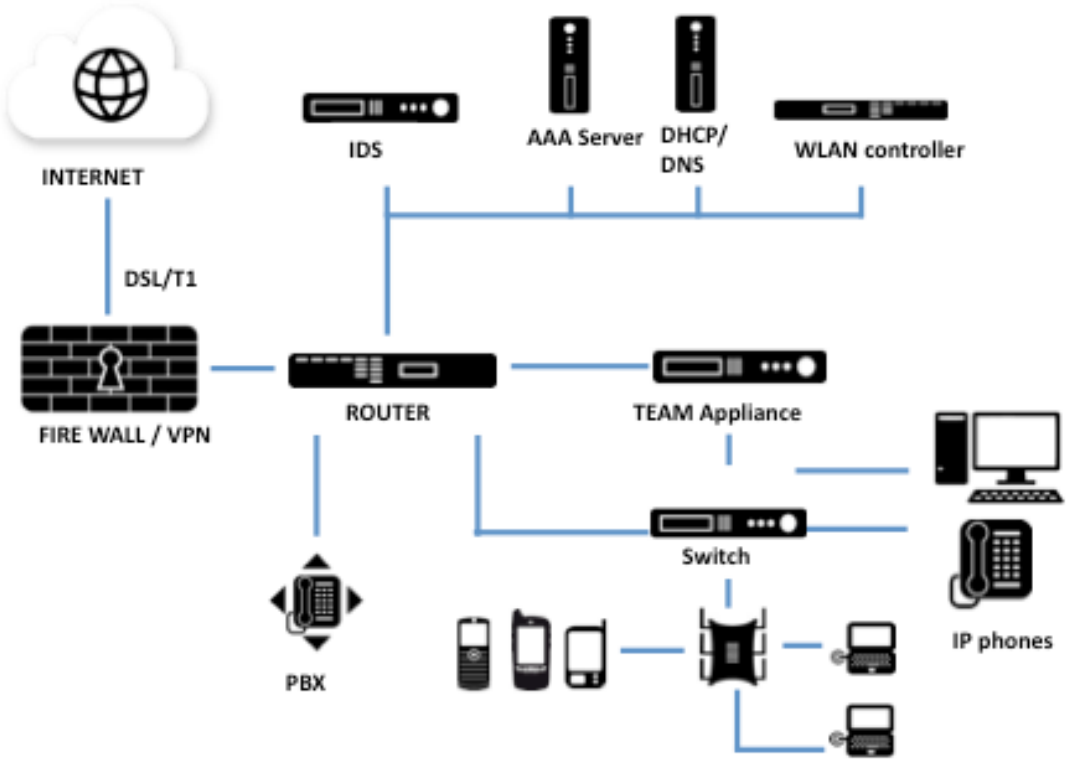

Figure 1 – A surprisingly large number of distinct limited-function units is often required in branch retail installations, usually the result of legacy installations, upgrades, and opportunistic, as opposed to strategic, incremental changes. *Source*: Motorola Solutions, Inc.

mobile devices in recent years, many of these will be the result of deploying new *applications* that expand and enhance both local operations and provide direct benefits for customers.

- *Constrained budgets* – While we wish the news here were better, it does appear that one legacy of the current recession that will be with us for some time is the need for significantly improved efficiency in IT budgets. And this reality will bring new focus to *total cost of ownership (TCO)*, which includes not just the *capital expense (CapEx)* involved in purchasing and installing new equipment, but also the recurring *operating expense (OpEx)* required to keep IT systems on the air. The very good news here, however, is that contemporary IT solutions designed for branch operations can have excellent price/performance ratios, excellent return on investment, and, via functional consolidation enabled via new technologies and IT products, far lower operating costs than is the case with the complex, multi-box solutions we noted above. It therefore makes sense, even with (or perhaps especially because of!) constrained budgets to look at recent advances in branch IT – unified wireless and wireless communications, integrated local processing, robust and flexible retail-centric applications, and more. Indeed, upgrades in branch IT capabilities can literally pay for themselves (and then

some) in the form of increased performance, operational efficiencies, and the internal and customer-facing benefits from the new services provisioned - and often over a very short payback period, if not immediately.

Re-Thinking Branch Retail IT – New Opportunities

As we noted above, *advances in wireless-LAN technology* alone can have a dramatic effect on both operational efficiency and in the ability to provide Web-like benefits to storefront retail shoppers. Note that Wi-Fi performance is not just about throughput or range alone, but rather the combination of the two – what is called *rate-vs.-range performance*. We are still seeing significant variability in this parameter among products from differing vendors, and we often suggest examining both higher-level architectural features (which can have a far greater impact on aggregate performance than radios alone) and system management and integration capabilities when looking for meaningful product differentiation. We also suggest that an emphasis on time-bounded services, most notably voice (telephony and messaging) but also increasingly video, should be a consideration in any wireless LAN installed in a retail environment. Wireless LANs, especially given the rate-vs.-range performance and improved reliability of 802.11n, are well-suited to provisioning these vital services very cost-effectively even in large retail settings.

The next key opportunity is in the *consolidation of branch IT functionality* into a much smaller number of physical units. This is a key trend we've noted lately – the integration of a broad range of networking and IT functions including those of the wireless LAN controller into what is often called a *services platform*, and is very much in concert with our theme of reducing complexity and thus cost. So, in minimal rack space (with minimal power and cooling requirements as well), it is now possible to have a wireless-LAN controller, power-over-Ethernet switch, router, wired and wireless security, and a platform for enterprise-authored and third-party software, among many other functions, all in a single functional unit with excellent price/performance (see Figure 2). A wide variety of Wi-Fi assurance tools, including spectral analysis, forensics, remote troubleshooting, and many more can also be integrated and managed remotely if desired. And, of course, it is also possible in some cases for local IT infrastructure to consist of little more than a single access point (in smaller venues, of course), with all other required processing in the cloud and thus extremely cost-effective operations the result – and with no compromise in functionality.

And, as we mentioned the cloud above, it is important to point out that such a strategy is very much in keeping with our ultimate goal here: *to bring the advantages of Web-based shopping to the storefront retail experience*. The commonality in IT infrastructure required, along with the fundamental cost-effectiveness of a cloud-based IT strategy, is instrumental in easing the implementation of this vision. Note also that all of this fits nicely with two other key trends in enterprise IT today, *virtualization* and the *cloud services*. Thus, once again, it may very well be possible in many cases to justify a new

installation yielding the benefits discussed above with said benefits literally paying for the effort involved – a win/win strategy with broad appeal for any retail enterprise today.

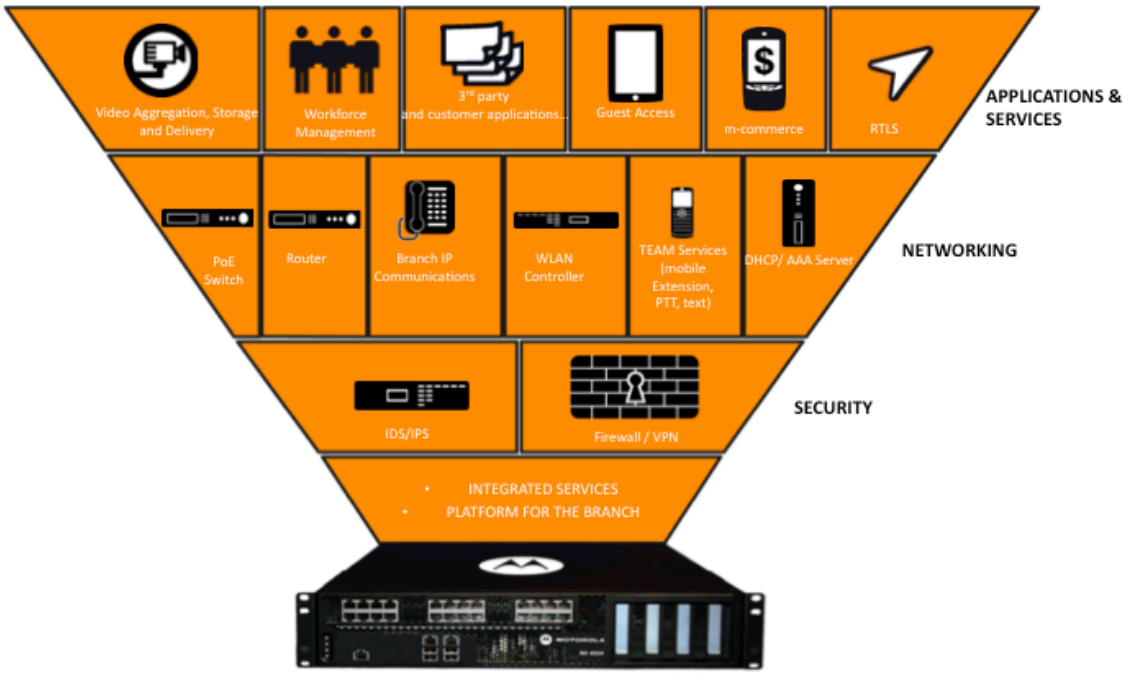

Figure 2 – Advances in wireless-LAN technology have resulted in highly-integrated products that include functionality far beyond that of a wireless-LAN controller alone. This example from Motorola Solutions details an *Integrated Services Platform* designed specifically for distributed branch retail operations, and able to address essentially every IT requirement even in larger stores. *Source*: Motorola Solutions, Inc.

From Vision to Reality: Requirements for Success

So far, we've established that the IT capabilities of storefront retail can be brought, via appropriate applications, to the point where Web-like services can be provisioned, that advances in wireless-LAN technology can provide the performance and cost-effectiveness required, and that consolidated, unified wired/wireless networking architectures incorporating a broad range of functionality, including the hosting of applications, have the power and flexibility to meet essentially any local retail IT challenge. A few additional requirements are also worth noting here:

- *Rich content* – What used to be called *multimedia* is today synonymous with engaging data presentation, support for voice (including telephony, vital in a highly-mobile environment like a store), and, as we noted, increasingly video as well. Video can be used to provide educational presentations for customers, surveillance for security and shrinkage-reduction initiatives, and can even be used to augment the resolution of location and tracking capabilities (see below).

- *Support for multiple clients and platforms* – It's critical in a "bring your own device" (BYOD) world, where associates and customers alike may wish to use their handsets and related mobile devices on the store's wireless LAN, to be as device- and platform-independent as possible. Restrictions as to supported devices, operating systems, or browsers should be avoided wherever possible. Customer "guest" access may be desirable in many cases, if for no other reason than to enable customer use of a retailer-specific app.

- *Workforce productivity* – It goes without saying that any capability enhancing worker productivity, particularly for our purposes here with respect to applications, must be supported in any viable branch IT solution.

- *Location and tracking* – Farpoint Group believes that the location and tracking systems available with (and often integrated into) contemporary enterprise-class wireless LANs will see increasing application in inventory management, directing customers to desired locations, location-based services, security, and monitoring operations. Location and tracking can work with unmodified client (including consumer) devices, and can be augmented with other technologies, like video, to improve accuracy and expand the utility and value of the technology.

- *Applications* – As we noted above, retail, like most other areas of IT, is today all about the apps. Branch IT systems, also as we noted above, can even host local apps, sourced both in-house as well as via third-parties. As the utility and efficiency of local operations can be dramatically enhanced through the effective use of software, this capability will, we believe, become *paramount* over the next few years. We also believe that real-time *analytics*, based on data gathered from the wireless network, will become a vital element in competitive success.

- *Flexibility* – Appropriate wireless LAN capability is key to addressing new requirements in a cost-effective manner, including self-checkout, kiosks of various forms, mobile couponing, accessing a common customer database, and many more services that can be implemented, deployed, and managed quickly, location-independently, and inexpensively. A flexible architecture also allows for simplified scalability, critical as growth is always a major challenge in retail.

- *Management* – And, finally, it is vital to consider the systems- and network-management capabilities of the local wireless network. This includes forensics, assurance tools for intrusion detection and prevention, and more. Management will, we believe, along with the flexibility of a given vendor's system architecture, become a key differentiator over the next few years. And, of course, central network and operations management are critical in any branch-focused enterprise, like retail.

An Interview with Motorola Solutions' Imran Akbar

One network-equipment vendor that has put a significant emphasis on retail systems and applications is *Motorola Solutions*, a company that can trace its roots back to the very early days of wireless LANs – both with its own innovations and via the acquisition of industry pioneer and retail-systems leader Symbol Technologies. Today's wireless LANs and other network products from Motorola Solutions include a broad range of products centered on the firm's recently-announced *NX Integrated Services Platform*, which has a core objective of both simplifying retail operations and enabling and hosting innovative applications designed to provide new cost, capability, and competitive benefits for Motorola's customers.

As applications are key to the vision we've outlined in this White Paper, we recently jumped at the opportunity to speak with Imran Akbar, VP & GM, Enterprise Networks & Communications at Motorola Solutions, about their recent announcements and the importance of innovation in retail IT. "Retail is the largest vertical market in the economy overall, and still growing rapidly - and IT is now at the very core of retail," Mr. Akbar told us. "The keys to meeting the needs of retail IT include mobility within the premises, collaboration capabilities for employees, and facilities that connect the consumer to the store, with all of these addressed with simplicity, cost-effectiveness, and flexibility as key goals."

With respect to flexibility, Mr. Akbar noted that applications are now essential to success in retail IT, just as they are in many other areas of both business and consumer IT. "Applications provide everything from new and enhanced functionality to management visibility," Mr. Akbar said. "From our own TEAM apps to a wide variety of third-party applications available from our partners, branch IT is now the key platform that will enable retail to prosper going forward."

Realizing the Benefits

The bottom line in retail today, we believe, is an *engaged customer* who looks not just for the best price, but also appreciates the value of services that can only be delivered in a storefront setting. In fact, as has been noted for many years, the lowest price alone is a poor differentiator if personal service and a pleasant shopping experience are sacrificed. The availability of staff who in turn have access to answers (and, for that matter, access to *knowledge*), personalized services, convenience, and a productive (and, of course, pleasant) store environment all show a respect for the customer and their time that builds loyalty and encourages return visits. Innovation in branch IT will go a long way, we believe, toward making these benefits a reality, again blending the best of storefront retail with the best of the Web.

And all of this can be accomplished in a surprisingly cost-effective manner, thanks to new unified wired/wireless technology aimed at branch operations and consolidating and simplifying function while expanding the range of possibilities for retail. Cost-effective growth, easily adding new applications, improved workforce management, mobile commence and Web integration, improved security and reliability, increased competitiveness, and, of course, improved bottom-line results can all be realized via the appropriate application of IT – again, based at its core on advanced, high-performance mobility-centric systems and technologies. Retail may, in fact, present some of the most exciting opportunities in all of wireless and mobility going forward.

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