Whitepaper

A Unified Approach to Retail Networks

Making the Retail Revolution a Little Less Revolting

An ancient Chinese curse goes something like this: "May you live in interesting times." Certainly these times for the retail industry are interesting, but while some retailers will see this as a curse, others will seize the opportunities that sweeping technological changes always offer.

Today, retailers are barraged by a cacophony of discordant voices, each with its own pet IT solution. "E-commerce is the only way to go." "ERP will cut costs and increase profits." "Don't forget the human touch!" Unfortunately, just as there is no free lunch in a capitalistic economy, there is no panacea when it comes to addressing the technology needs of retailers. Implementing patchwork solutions often leaves the retailer with a patchwork of problems. Tomorrow's successful retailers will begin today to transform compartmentalized IT processes into unified solutions. The problem often is: Where does the process start?

In times as interesting as these, a conceptual reexamination of ones roots forces us to hold onto what has contributed to our past successes while we learn to deal with the changing models and shifting paradigms which the inexorable advancements in technology always bring. In the world of retail IT, the roots we deal with are those infrastructure technologies upon which applications and management control systems are based. Without a solid foundation at the infrastructure level, applications and management systems are bound, at the very least, to falter, and, quite possibly, they will fail altogether. This paper will examine unified IT solutions for retailers. That is, infrastructures, applications and management control systems linked seamlessly and directed toward the only objective that counts, a thriving and prosperous retail organization.

This whitepaper addresses a number of topics of critical interest to retailers:

Changing Models, Shifting Paradigms	E-commerce Call Centers Voice over IP
Keeping the Customer First	Customer Service
Square One: In-store operations	POS Infrastructure In-Store Wireless Small-format networks Large-format networks Employee training Virtual Private Networks (VPN)
Enterprise Networking	ERP Infrastructures LAN/WAN Corporate Networks Distribution Centers
Network Management	Tools with a Strategic Purpose
In Conclusion…	Unified Solutions

E-commerce: Changing models, shifting paradigms

Much has been said and written about the e-commerce revolution. Although a full treatment of e-commerce lies beyond the scope of this whitepaper (See Nortel Networks' "Building an E-Commerce Network" whitepaper.), it is important to point out that e-commerce can be either revolutionary or evolutionary. For the established bricks-and-mortar retailer, e-commerce should be perceived not as a threat, but rather, as an opportunity to expand one's business presence without adding physical retail outlets. Some of the technologies that are making e-commerce possible have tremendous potential for complementing a retailer's traditional store network.

Personalization techniques, for example, are now being used in e-commerce which automatically customize a World Wide Web site to the preferences and tastes of each individual customer, in much the same way that experienced sales associates remember a regular customer's tastes and steer him to the appropriate merchandise.

Prosperous retailers will succeed at combining the traditional bricks-and-mortar retail network and the brave new world of e-commerce if they can embrace today's powerful new e-commerce techniques and select those techniques that are consistent with the retailer's strategic positioning and which complement the retailer's traditional way of doing business. The systems in Nortel Networks' new portfolio of Internet Protocol (IP)-based telephony solutions, which is derived from the Internet Communications Architecture and known as Inca, have the flexibility and strategic capabilities retailers of the future will need. You will hear more about Inca as you read through the remainder of this whitepaper.

Building relationships electronically: Call Centers

Sometimes the complexity of retailing belies its simplicity. It doesn't matter whether the prospective buyer comes to the retailer in person, over the telephone or through the Internet. What does matter is the relationship that the retail enterprise builds with each individual. How well the retailer and consumer connect on all levels – physically, economically, culturally and others – will determine when or if the consumer returns.

The call centers of today, where 98 percent of customer interaction is conducted over the telephone, are evolving into much more productive multimedia customer care centers with agents interacting with customers in a variety of ways, including e-mail, faxes, direct interaction through a web site and one-on-one voice interaction. Of course implementing a unified system of customer care that improves customer loyalty can also present the retailer with a set of technological challenges. Nortel Networks' Symposium Call Center Server's client-server architecture offers flexibility, scalability, customized applications and special call routing and treatment. And the Symposium Interactive Voice Response platform offers a wide spectrum of capabilities, including highly sophisticated computer/telephony integration (CTI).

Retailers' call center operations are implementing multimedia applications for the return on their investments. At a time when call center labor costs are growing at an annual rate of 30 percent (Source: Murray Institutional Research, 1998), some retailers are figuring out how to harness the power of the World Wide Web with the personal interaction of call centers. A key technology affecting customer care centers of the future will be voice over the Internet protocol (VOIP). More than a whiz-bang technical feat, VOIP lets retailers put a human face on what can be a very cold, impersonal process. Clicking on a button on the screen can instantaneously connect the consumer with call center personnel. The results have been promising indeed. Customer satisfaction increases and, by humanizing

what is essentially a self-service process, the retailer encourages greater use, which, in turn, makes customer care personnel more productive. A study by Forester Research (1998) predicts that web-enabled call centers will have a cost structure 43 percent lower than typical call centers.

Keeping the customer first: Customer Service

The inherited wisdom of centuries of retailing says that successful retailers place the customer first. Quality customer service in all of its many different meanings and nuances is indeed one of those basic infrastructure concepts that all long-standing retail organizations are built upon. And yet, retailers often follow a precarious balancing act between customer service and competitiveness. The two concepts are not necessarily exclusive of each other, but they often fight a tug-of-war on the balance sheet.

Improving customer service carries a price tag in terms of hiring more sales associates, instigating better training for back-office support personnel, adding to the in-store inventory or any number of costly programs. For retailers joined in battle with low-cost competitors, the thought of decreasing costs by skimping on customer service is tempting, because the alternative -- higher costs and either less profit or less business -- leads to a weaker competitive position in the marketplace.

Information, networking and communications technology based on a solid infrastructure can tip the balance between customer service and competitiveness in favor of the adept retailer. Obviously, an IT infrastructure carries its own price tag, but IT investments will pay off in more productive personnel. So, instead of hiring more sales associates to improve customer service, an in-store wireless communication system like the Companion series from Nortel Networks can make each sales associate more productive and each customer feel like they're the most important sale of the day. And, at the high-end, IP-based telephony solutions such as the Inca systems can unify voice, data and video applications for additional operational cost savings.

In a global economic environment, retailers are realizing that customer service can be just as potent a differentiator as price. A recent study by the Gartner Group emphasized the importance of customer service for retailers. "Through the year 2000 and beyond, providing world class customer service and support will be a critical success factor for all organizations, regardless of industry or status, in their ability to compete and survive." (Source: Gartner Group)

Square One: In-Store Operations

No one would debate that enterprise-wide systems are important to the health and well being of retail organizations, but savvy retailers know that the success of the entire enterprise rests on the success of each and every location, whether it be a physical bricks-and-mortar location or a site in cyberspace. The most effective systems possible at the enterprise level can not make up for inefficient systems at the local level.

The key to planning in-store systems is that they must be planned in relation to enterprise systems so that the whole is unified and seamless. In the event that the enterprise plan is still evolving, relying on systems that are based on industry-accepted open standards will ensure that local systems can be effectively melded into larger global systems in the future.

In many ways, the retail battle is won or lost at the store or web-site level because that's where the most critical customer interaction occurs.

First impressions are made here, expectations are set, and relationships are either built or they just never get going. Reliable, scalable, flexible and extensible voice/data/video systems are integral to this first line of defense for retailers. Sales associates or their web-site surrogates armed with advanced communications and computing systems are able to effectively manage the customer relationship so that it grows and deepens over time.

Most in-store systems have a hierarchical relation to each other with the point-of-sale (POS) and credit card authorization systems as the most mission-critical. The reliability, responsiveness and integrity of a retail operation's POS are operational imperatives. Other customer-oriented systems, such as the gift registry or a self-service kiosk system follow the store's POS in importance. Then

back-office functions like labor scheduling, inventory management and others provide critical functionality, but are not as mission-critical as the customer-interaction systems.

The fact that all of these in-store systems are today being made easier to use is both good news and bad. Being easier to use means that in-store systems will be more effective, making sales associates more efficient. The bad news is that in order to make these systems easier to use, they have become increasingly graphical, much more intuitive and, in many instances, Java-based, which translates into an insatiable need for more bandwidth for a store's voice/data system.

Systems such as the Norstar key system and the Passport data switches offer retailers the kind of flexibility, bandwidth, scalability and

voice/data/video integration they need to implement in-store systems that will form the foundation for a going concern. With a solid infrastructure as a foundation, other customer-interaction applications like wireless connectivity through the Companion system to sales associates anywhere on the store floor can be added in the future without straining the capabilities of in-store systems. Mobility has already become a critical functionality for many retail operations. Wireless handsets that give store personnel access to inventory and pricing information means that customer questions can be answered immediately from anywhere in the store. This speeds the retail transaction process along to completion and the first steps are taken toward building an on-going relationship with a satisfied customer.

A fit for stores of all sizes

Some of the exciting new Internet-related technologies, such as virtual private networks (VPNs) and VOIP, certainly can and will be used effectively by all types of retailers, but as retail organizations grow, they reach a certain critical mass where dependence on dial-up connections to the public switched telephone network (PSTN) are not adequate. This often leads to hybrid solutions and eventually dedicated

networks for global retailers with large-format facilities. Many small-format and regional retailers are finding that VPNs, which use the Internet as the connecting media, are a very cost-effective WAN alternative. For example, PC PBX multi-service platforms, LAN PBXs and hybrid IP-enabled PBXs can form the in-store basis for a VPN linking geographically dispersed locations to a central call center where e-commerce or call-in orders are handled.

Customers can place orders through an e-commerce site on the World Wide Web or use an 800 number to reach the firm's centralized e-commerce call center. The center then routes the order over an Internet-based VPN to the store closest to the e-commerce customer or caller. The savings in long-distance telephone charges alone can be significant.

As a retail network grows and the applications used by each

location become more graphical, mid-level retailers may begin to encounter bandwidth limitations with dial-in-oriented VPNs. In search of an effective solution, medium-sized retailers can turn to hybrid networks involving a combination of technologies. Norstar voice and data gateways or any of the Accelar routing switches offer small site connectivity to an organization's LAN/WAN infrastructure. Intelligent in-store routers, which automatically find new communications links to alternative Internet service providers (ISPs) in the event of disruptions in the PSTN, can also be used to assure high availability of mission-critical retail systems.

At the high-end of the retail spectrum, global retailers with large-format stores and graphically robust, bandwidth-hungry applications will have a greater need for dedicated or semi-dedicated, high-bandwidth networks. Many satellite-based frame relay networks can not offer the bandwidth or redundancy needed by global retailers. In addition, combining VOIP and resource-demanding video communications over the same VPN may not result in the quality-of-service needed by the retailer. To address these quandaries, new infrastructure configurations are being devised. For example, some large-format stores now have an ATM switch for voice and data communications. This switch is connected directly to a public service ATM network. As a backup to such a network, voice communications can be rerouted through standard PBX channels while data and video are sent through ISDN dial-up connections. The Inca Communications Systems (Inca M1, M10, M100, M7500 and others) as well as the Meridian SL-100 systems offer integrated IP and large-bandwidth connectivity that can form the basis for an organization's WAN infrastructure.

Connecting with your employees

Finding qualified in-store or e-commerce personnel has become more difficult and more expensive for retailers as the pool of available labor shrinks. Retaining qualified employees once they are found is exacerbated by the nature of most retail organizations. Assuring a feeling of success and engendering a sense of connectedness among employees in far-flung retail companies is difficult at best, but absolutely necessary for retaining satisfied employees.

Large bandwidth integrated voice, data and video connections through a VPN, intranet or the public WAN using Nortel Networks' Meridian systems or Passport series of internetworking platforms can provide the basis for an in-store computer-based training (CBT) network that would help retailers train new employees and make them more productive faster. Training courses can be dispersed from a central location and administered at relatively simple facilities in each store. On-going training can be rapidly deployed as new merchandise is stocked in inventory or as seasonal promotions are rolled out.

Following an initial training period, many store associates in remote store locations quickly develop a sense of isolation or even alienation from the organization. Some progressive retailers have committed to real-time video-based supervision, which can alleviate these problems. The retailer's supervisory staff can remotely monitor the process at the point of sale to offer training tips to individual sales associates to increase their chances for success. If handled correctly, new employees can learn by doing and the organization can take advantage of techniques like up-selling and cross-selling on a consistent basis.

Enterprise Networking

The rage these days among firms from all sorts of industries is enterprise resource planning (ERP). This $23 billion-a-year market is expected to explode through the year 2002 to an $84 billion segment (Source: AMR Research, Cambridge, Mass.). The reason behind such phenomenal growth is simple. ERP software systems can improve the efficiency of virtually every aspect of an enterprise's operation, including manufacturing, finance, sales, marketing, human resources, supply chain management, and especially

the new world of electronic commerce.

What ERP software can't do is improve the underlying communications and computer systems upon which it depends. Not every retailer will choose to implement an ERP system, which costs a Fortune 500 company an estimated $30 million in licensing fees and another $200 million in consulting fees (Source: Fortune Magazine, December 7, 1998). But improving the components that make up a retailer's communication and computer infrastructure are within the

grasp of enterprises both large and small. For enterprises implementing ERP or those just striving to improve their operating efficiencies in order to maintain their competitiveness, a unified and effective infrastructure is imperative. Solutions might come in the form of improving the firm's communications capabilities with powerful worldwide PBX functionality through the Meridian SL100 systems or intelligent applications that empower people, like CallPilot Unified messaging or the Symposium Customer Care Center suite of applications.

LAN/WAN: Where the rubber meets the road

Throughout every business day and well into the night after the store has closed, retail locations are constantly exchanging information with the world outside their bricks-and-mortar location. For many retailers the LAN/WAN system they have used in the past is hitting a performance wall. Frame relay networks over leased telephone lines or satellite connections are often inflexible, costly and limited in terms of fail-safe redundancy. In today's global retail environment, a communications outage of any sort can cause staggering losses in revenues very quickly.

At a time when retail applications are becoming more browser-like every day,

the demands for large amounts of bandwidth and the efficient use of this bandwidth are becoming increasingly strident. Many retail organizations are turning to a unified network approach where a dynamically allocated communication pipe is used for all types of information, including voice, data and video. Dynamic and automatic allocation of bandwidth is critical to retailers because the communications patterns of most organizations shift dramatically, depending upon the time of day. During business hours, many retailers have a high volume of voice traffic as well as on-going data communications for credit card authorization and other functions. But after the store

has closed, voice communication drops off dramatically while data communications between the store and either regional or world headquarters and distribution centers increases. Being able to dynamically allocate the communications pipe between the different types of communication can bring significant savings to retail organizations.

In stores or other remote offices, systems like Nortel Network's Norstar, Meridian and Accelar™ routing switches can keep far-flung locations in touch with regional offices or call centers, corporate headquarters or external service providers. With a unified approach to

communications, retailers simplify their control mechanisms and reap the benefits of cost savings through the use of new concepts like VPNs, VOIP,

Corporate Networks

A study by Chain Store Age Magazine showed that improving retail organizations' internal networks was the second most important issue to be addressed in 1999, ranking just behind the Y2K problem. Included in this emphasis on enhancing intra-company networks are systems and communications channels for managing many of a retailer's back-office systems at the enterprise level. To maintain a competitive position in the marketplace, retailers must examine every aspect of the retail process, not just in-store systems or those systems which touch customers. Successful retailers will monitor all systems with an eye toward maximizing efficiencies wherever possible. Greater efficiency in buying merchandise, warehousing it, distributing it, managing inventory and effectively promoting sales world-wide can have just as critical an effect on a retailer's profitability as any in-store system.

Quite simply, the retail process starts with a buyer trying to predict what merchandise customers will want. Aggregating the purchase decisions of buyers for a global or regional retailer can

intranets, extranets and various hybrid combinations of these concepts that are determined by the needs of individual retailers. With this plethora of new technologies,

result in a need for large bandwidth communications

connections between retailers and suppliers. Unlike the needs of individual retail locations, which have smaller transactions but a greater volume of them, corporate or regional headquarters have transactions that are often quite large. In addition, corporate applications are moving in the same direction as in-store applications. The graphical content of all retail systems is increasing rapidly, causing additional demand on the bandwidth capacity of a retail organization's infrastructure.

Extranets, or using the facilities of the Internet to connect with external suppliers, is rapidly becoming an important and cost-effective aspect of retailers' supply-chain management systems. Intranet and extranet technologies like Baystack routers, the Enterprise Edge and the Contivity platform have the bandwidth and number of channels needed to effectively connect a large number of buyers with an even larger number of suppliers. In addition, VOIP on a supplier extranet will be used in the future to reduce voice communications costs.

the only limit on today's retail solutions today comes from the limited creativity and imaginations of network designers.

After merchandise is ordered, it must be delivered to a distribution center where it is

warehoused before being forwarded to retail locations. Distribution centers have their own unique needs when it comes to data networking and voice communications. ATM switches like the Centillion or routing switches such as the Accelar line give distribution centers high-bandwidth access to campus backbone networks using ATM or gigabit Ethernet. For most retailers, scalability is a critical factor with any sort of networking equipment. As the number of retail outlets served by a distribution center grows, the center's systems must be flexible enough to scale upwards as the bandwidth requirements of management systems increases. To reach beyond the campus setting of distribution centers, EDI interface systems like the Passport enterprise network switching platforms can provide ATM, frame relay, IP or telephony access to the PSTN and the Internet.

In addition, the internal management of distribution centers is often streamlined by the use of handheld wireless devices for inventory

management, pick-and-pack order processing and other systems. Meridian 1 switching systems form an effective interface to wireless systems like the Companion.

Network Management: Tools with a Strategic Purpose

Every type of business has its mission-critical applications. Retail is no exception. Point-of-sales has to be right at the top of the list for most, if not all, retailers. But beyond POS, the priority an application receives is usually determined by the strategic position of the retailer in the minds of consumers. If the retailer has decided to create a perception among consumers of being the price-leader, the organization may place greater emphasis on the thoroughness of its merchandise acquisition systems for the purpose of acquiring low-cost merchandise. Other retailers more intent on always having the most avant-garde fashions available might place greater priority on systems which help it control and turn over inventory faster at the store level.

Whatever the positioning or the marketing strategy of the retail chain, the retailer's network management tools must be flexible, powerful and scalable enough to support the organization's

strategy. Without effective management tools, such as the Optivity management platform, it would be impossible for retailers to focus and prioritize their voice and data networking systems on a common business goal. The Optivity NETArchitect gives network managers the ability to view the network configuration by device or by logical grouping and to manage and secure all the files required to maintain integrity across the entire network.

As a foundation, network control systems involve unified network management (Figure 1). Here, the health of the retailer's network is monitored and faults are identified. The configuration of the entire network is maintained and its performance managed. The information provided by the unified network management level can be used by a retailer's IT staff to analyze the network itself and plan for growth and enhancements.

Unified policy management builds on the control put in

place at the network management level. Policy management involves the provisioning, enforcement and verification of policies that are an expression of the organization's business decisions. Unified policy management ensures network-wide quality of service and security across geographically dispersed network elements.

Unified service management helps the retailer monitor and measure the actual service provided by the network over and against the company's established policies. At this level, the end-to-end performance of applications is measured and those pre-defined user service levels are validated. Instrumentation and accounting methods are deployed to collect three classes of management information, response time, bandwidth utilization and network resiliency. This type of information is constantly compared with the firm's strategic policies to ensure the right mission-critical applications are receiving the correct priority treatment.

Unified Retail Solutions

The basic retail process has not changed, but new communications and computer technologies have been and will continue to be

applied in the retail business at an astounding pace. Navigating through these interesting times will require a commitment to progress as

well as a dedication to the values that have been the basis for longstanding retail success. Partnering with suppliers like Nortel Networks, a company

dedicated to providing unified solutions for retailers' infrastructures, applications and management control, will be critical for the success of retailers in the future.