



SCO Solutions for the Retail Market

Retail Hardened Linux for Point of Sale

An SCO White Paper
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Management Summary

The landscape of the business to consumer retail industry is changing. The ease and speed by which consumers can comparison shop on the Web has forced prices down and reduced profits. Consumers have come to expect higher levels of customer service as well as consistency of those services across all business-to-consumer sales channels. To meet these challenges, and remain competitive and profitable, retailers recognize that technology is the necessary strategic weapon.

But which technologies? The challenge is to identify solutions that both satisfy requirements today, and are easily adaptable and extensible as business conditions change. Freedom and flexibility must be at the very foundation of any solution that is deployed.

The Microsoft dominated Point of Sale (POS) environment, running on legacy DOS, OS/2, and Windows operating systems is now being challenged by the Linux operating system. As a completely open, multi-vendor platform, Linux guarantees a level of freedom that no other platform can even begin to approach. As a standards-based platform, Linux is easily integrated with any other system that adheres to the same open industry standards.

SCO has been a trusted supplier of retail products and services for over 20 years. Totally focussed on delivering Linux and UNIX solutions SCO has introduced a retail hardened framework for Linux-based POS devices. Using industry standard Linux technologies, SCO has made the decision to deploy Linux on POS a simple and painless option.

The benefits of Linux on POS are huge in terms of software/hardware acquisition costs, manageability, and most importantly reliability. This white paper examines the benefits of Linux on POS, SCO's retail-hardened POS value add and presents a migration strategy for retailers to protect their current investment while realizing the benefits of moving to Linux on POS devices.

POS Operating Systems in Transition

Today, the variety of POS devices is exploding, as consumers demand more convenience and more ways to shop. Successful retailers are finding innovative ways to exploit the technology to achieve higher customer satisfaction and higher revenue. For example, Stop & Shop, a leading US-based grocery chain, is installing Web-enabled kiosks linked to NetGrocer.com to allow shoppers to order products that Stop & Shop doesn't carry in stores. Virgin Records gives its customers the ability to preview CDs and DVDs prior to purchase. Virgin has

discovered that customers who preview CDs are three times more likely to purchase the CD. Yet there are still many retailers running on character based DOS or OS/2 terminals, on aging hardware. These older systems restrict retailers' ability to:

- ? Reduce sales associate training time by offering a graphical user interface
- ? Offer more options to the consumer without adding more staff.
- ? Install newer, USB devices that make it feasible for non-technical store personnel to administer or trouble shoot the devices

At the same time, the retailer is being forced to retain or recruit IT personnel who have experience with these legacy platforms, and who are generally paid premium salaries.

Many retailers have installed Microsoft Windows- based products. However, retailers are starting to realize the downsides of a Microsoft approach:

Reliability is a key issue. The mean time between failure of Windows NT is 919 hours (according to a study commissioned by Microsoft). In a store that is open 24x7 this is unacceptable.

Software Costs – Windows license fees are high and are getting higher. Microsoft's new 6.0 License Plan is creating an additional software levy with enforced upgrade plans that make Microsoft solutions very expensive.

Hardware Costs – Whilst hardware costs are still declining, the hardware footprint of Windows keeps increasing. With the sheer number of devices required to run a store the expense multiplies rapidly.

Complexity – Although Microsoft has a number of embedded offerings the majority of POS applications require full Windows XP licenses to run. The overhead and complexity is overkill for a small footprint POS device.

Retailers are starting to evaluate their options and are asking the following questions:

- ? *What does the ideal next generation POS operating system look like?*
- ? *What characteristics are necessary to maximize flexibility for the retailer whilst keeping costs down and reliability up?*

Next Generation POS Operating system Requirements

Now we will examine some of the key characteristics of the ideal operating system environment for a POS device.

Low Cost of Acquisition

Where margins are slim, investment in new hardware and software have to show quick payback. The next generation operating system needs to run on a minimal hardware footprint to keep unit costs down. In addition, the software licensing model and initial purchase price needs to drive to the lowest cost. POS systems typically have a 4 – 6 year usable lifetime and so software maintenance needs to be minimal or zero.

Ideally, retailers should be able to reuse existing legacy POS hardware by installing new operating system and application software. Current Microsoft offerings require a hardware upgrade for each software upgrade. This ultimately drives up the cost of deploying new applications.

Low Cost of Deployment

To achieve profitability, customer facing systems must never crash. Bullet proof reliability is another “must have” feature of a POS operating system. This includes the ability to recover from hardware and networking failure as well as underlying stability and reliability of the operating system itself.

In the event a POS device fails completely there are generally two options:

1. Re-provision the device (assuming the hardware still functions)
2. Completely replace with a new unit.

Both of these options generally require expertise on site to set up and provision the new system. Ideally, the operating system should support “plug- and- go” replacement for in-field hardware failure. The new hardware should be able to be installed by a non-technical user, plugged into the store network, and provisioned automatically by the store server without intervention from a technical specialist.

Being able to update the operating system and application logic is becoming a key requirement in staying competitive. Introduction of new loyalty schemes, pricing methodologies, and promotions require POS application code to be updated frequently. Features that enable the remote updating of applications, patches, and bug fixes drive down the cost of touching each device while increasing the speed of deploying new functionality.

Freedom of Choice

Building solutions that rely on a single vendor is almost a guarantee that at some point, the business needs will be held hostage by that single vendor. The ability to quickly adopt new technology to respond to industry dynamics is a pre-requisite to maintaining a competitive advantage. Yet proprietary platforms are never on the leading edge of technology. Vendors are reluctant to risk adopting

a new technology before it gains wide acceptance. Proprietary vendors ride the technology wave, they don't create it.

Microsoft users are beginning to realize there is a high cost of deploying a proprietary vendor's solution stack. Once the customer is locked in to proprietary technology, the vendor has control and can dictate licensing terms, the rate of new technology adoption, and the customer's upgrade schedule.

Using an open architecture with open standards is the ideal way for customers to keep their options open. Those options should include hardware and application independence, as well as the ability to plug and play different technologies from the open standards and open source community.

Linux – the Next Generation POS Operating System?

Linux is striding into the POS operating system world. Several of the major retail hardware vendors have announced support for Linux. Let's explore what Linux provides that makes it so attractive on POS devices.

Low License Costs

There is a general perception that "Linux is free", which, if true, would be all that is needed to be said to substantiate the claim that "Linux is less costly than any other option". However, for the purposes of this paper, the assumption is made that commercial users expect to pay, and in fact do pay for the operating system. Purchase price is only one element of the Total Cost of Ownership (TCO). Other components of cost are:

- ? License fees
- ? Hardware costs
- ? Integration costs
- ? Deployment costs
- ? Support and Maintenance costs

SCO's Linux POS per seat license fee is approximately \$65, which includes the right to use fee, integration costs, and a proportion of the deployment and maintenance cost.

Microsoft license fee for Embedded NT is "under \$75 per device", according to a Microsoft's press release. This clearly just pays for the license. (Many retailers require full XP licenses to run their applications driving the license cost alone up to \$100 – 150 per seat.) Integration, deployment, and maintenance need to be added to these costs along with the new Software Assurance annual fees. The difference may seem small, but consider that this is a "per device" fee. Retailers often have several thousand POS devices so that small fee can add up quickly.

Thrives on Low Specification and Legacy Hardware

Linux enjoys the reputation of being able to run and perform well on legacy hardware. Linux can run on the humblest Intel 386 processor box and is happy with minimal memory and disk space. This provides the ability to recycle those old Windows boxes and put them to good, productive use in a Linux environment. When budgets are cut back, it is often the capital expense budget that is cut first, and cut the deepest. The fact that Linux runs on legacy hardware means that it is possible to continue software upgrades or migrations without purchasing new hardware.

Highly configurable and Customizable

Linux is totally open. Source code is available to all and the architecture and design is well understood. As a result, it can be customized to suit the application. The exact set of components required to support an application or function can be chosen to build an optimized setup.

Open Architecture and Standards Based

Linux adheres to all of the key open system standards, including those for application programming, and for networking and connectivity. Built by the open source community, there is an array of programmers tracking standards and rapidly building code to support the latest and greatest. The result is freedom from vendor lock-in for any part of the solution you deploy.

Technology advances are incorporated into the operating system as soon as they are available. Linux platforms can work in a dynamic, heterogeneous environment because Linux can connect with just about any technology that adheres to the networking and connectivity standards. It means that feature upgrades can be phased in smoothly and orderly, and that it is not necessary to rip out and replace the entire environment to take advantage of a software feature upgrade.

Reliability and Availability

Linux's big cousin, UNIX, has the well-earned reputation of being highly reliable and available. In particular, SCO's Open UNIX product has achieved 99.999% uptime in laboratory tests. UNIX, particularly on Intel hardware, is beginning to decline in popularity because customers are realizing that Linux is as reliable as UNIX, but at a lower cost. Several large OEMs also recognize Linux's capabilities and now position Linux as the entry-level UNIX solution.

Beginning in 2001, there was a surge in the adoption of Linux as a client OS. IDC ¹ predicts that this surge will continue, resulting in an 18% CAGR for the period 2001 – 2006. It is noteworthy that IDC unit forecasts account for revenue generating shipments only. To fully understand the explosive growth, free shipments need to be counted as well. By IDC's estimate, the revenue generating shipments account for only half of the Linux client shipments. By

¹ Worldwide Linux Operating Environments Forecast, 2002 – 2006: Client Shipments Pick Up the Pace , Feb. 2002

contrast, IDC² predicts the CAGR for Windows clients (professional grade products only) over the same period will be only 12.3%.

SCO's POS Solution

SCO has a unique offering for POS devices, based on standard Linux called "Smallfoot". Smallfoot is a development template and toolkit created by SCO's Professional Services staff to create optimized POS platforms. SCO developed this offering as a result of engagements with a number of retail companies deploying Linux for POS use.

SCO's Professional Services team has built a toolkit that provides the key components required for a retail-hardened Linux operating system, and goes beyond the facilities of a generic Linux distribution. The toolkit meets all the needs highlighted in the *Next Generation POS Operating System Requirements* section. In addition, the technologies and features are compatible with any Linux Standard Board (LSB)-compliant Linux distribution:

Rapid boot up time – startup has been optimized to launch the minimum necessary services for a POS application. Clearly the goal is to bring the POS application up as soon as possible to minimize queues and lost business.

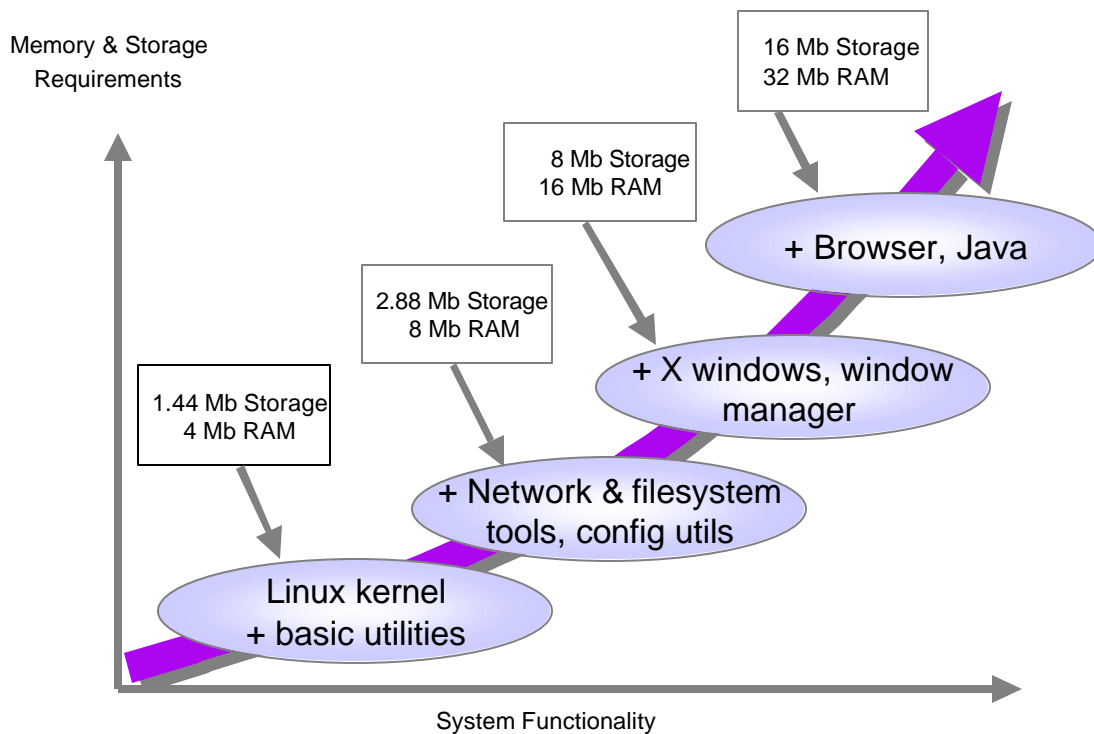
Diskfull and diskless configurations – a variety of application architectures can be accommodated by thick and thin clients or a combination of both models. Resilience can be achieved by a thick client model, reducing dependence on the networking infrastructure.

Reliability Features - In addition to the basic reliability of the Linux operating system, a number of resilience features have been built-in to ensure minimum downtime:

- ? Incorruptible storage via read only file systems
- ? Self healing - in the event of storage failure the OS can repair itself to allow the system to come back up even after disk errors
- ? Enables a combination of persistent local storage and network storage

Optimized Linux Operating System Footprint - minimum necessary software configuration minimizes the hardware costs. A range of hardware specifications can be supported depending on the services required and the application logic that has to run on the POS device as illustrated in the following model

² Worldwide Windows Operating Environments Forecast, 2002 –2006: The Microsoft Machine Continues on Course, Feb, 2002



Brand-able boot up process – the boot up sequence can be customized with the retailer’s or vendor’s logos. The startup processes have been optimized to be the minimum information necessary.

Smaller and faster than classic Linux and Microsoft OS’s as a result of the smaller hardware footprint and the optimization of the services installed. The resulting system is much faster than equivalent generic Linux distributions and Microsoft operating systems.

Self-installing and provisionable in-store – POS devices can be drop shipped to the stores and then installed automatically. This can avoid the need to send out a qualified engineer to manage break/fix scenarios.

Auto detection of hardware – Enabling one installation build for different POS devices. This simplifies administration of different POS device types and makes maintenance and repair much simpler.

Rapid deployment through integrated replication tools – Replication of system software can be carried out using simple tools via CDs or the network. POS deployments are faster and cheaper as a result.

Integration with the SCO Manager framework – SCO Manager enables remote software updates, system monitoring, software, and hardware inventory of POS devices.

Advantages of the SCO Approach

SCO's team of professional services consultants have over 20 years of retail focused experience. SCO's approach to a POS Linux deployment based on Smallfoot is to work together with the application provider to specify the footprint and services required for the POS device. Once this is determined, SCO uses its Smallfoot template and toolkit to generate an optimized Linux operating system that meets the defined requirements.

A traditional professional services approach to accomplishing the above would be to treat each engagement as a "start from scratch" custom job.

However, SCO's method delivers the POS device with an OS, the application, and much more. The development template that SCO uses to replicate the foundation for each solution is also made available to the customer. During the customization phase, SCO gives the customer the option of working with the SCO professional services team. At the end of the engagement, the customer has a solution on the POS, a development template to create solutions for other POS devices, and an in-house staff that is trained.

Re-using the development template in the customization process is faster too. And because the work is completed more quickly, the solution is available sooner, and the total cost of the project is less than it would be in a traditional professional services approach.

The template approach has other benefits. SCO's highly skilled professional services staff is continually refining the template to keep pace with technology improvements in POS devices. This "reusable" approach to developing the solution eliminates a significant portion of the risk normally associated with a professional services engagement.

SCO Support and Service Offerings

SCO's professional services offerings extend beyond Smallfoot to other areas that are useful in the retail and replicated site market. Currently, there are three additional "packaged services" offerings:

1. *Platform Design Service Package* - At the completion of this service, the customer receives a detailed proposal that includes:
 - ? An evaluation of the current environment
 - ? The customer's readiness for moving to Linux
 - ? A Linux configuration
 - ? Recommended tools that can assist the migration process

2. *Platform Production Service Package* – SCO develops customized, new components for the existing environment, and delivers a new, fully tested, and integrated solution.
3. *Replication and Deployment Service Package* - This is the most popular service among SCO's replicated site customers because it significantly reduces the cost of deploying a specific configuration out to multiple remote sites. SCO will create and execute a mass deployment process to all remote sites, without an engineer traveling to each of the sites.

Extended Warranty Services - This service is particularly useful for retailers who have limited IT resources available. Every product covered by the extended warranty service will be supported and maintained by SCO, including the maintenance required to support new hardware and software, which frees up internal resources for new system development. Extended support services are provided by SCO's award winning support team. That support team recently captured the Network Computing award for best Linux support service as well as the "service of the year award."

Summary

Successful multi-channel retailing begins at the POS. Having the right POS solution is more than half of the challenge. Getting it wrong dooms the retailer to failure. SCO has been delivering exceptional products and services for the retail market for over 20 years. SCO continues to focus on solutions for the retail/replicated site market, and delivers the finest products and services to enable multi-channel retailing.

Let SCO help ensure your success by rapidly developing, deploying, and supporting the right POS solution. To learn more about how SCO can help you be successful, visit: www.SCO.com/retail/