WHITE PAPER

Selecting the Right Approach Dramatically Impacts the Economics of Virtual Client Computing

Sponsored by: NComputing

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IDC OPINION

Client virtualization — or virtual client computing (VCC) — has overcome technical, business, and product education objections, and it is now a widely accepted computing solution. When VCC projects are properly understood, scoped, and implemented, they can offer lower initial cost, better operational stability, increased user accessibility, stronger data security, and lower-cost support than traditional IT models.

Achieving improved IT results, better operational flexibility, and increased agility through VCC, however, requires making choices between different VCC models. Centralized virtual desktops (CVDs), also known as virtual desktop infrastructure (VDI), and virtual user sessions (VUSs), also known as terminal services, are the two main models to choose from. Gaining the full benefits of a VCC project requires an organization to expend effort in order to match its attributes (business model, user requirements, IT capabilities) and expectations (project scope, expected benefits, timing, cost) with the right model.

While there has been momentum toward CVD for a variety of reasons, especially in larger enterprises, VUS solutions continue to represent the biggest share of the VCC market. Despite having more application compatibility factors to consider, customers deploying VUS solutions identify economic benefits stemming from greater user density and less demanding use of hosting resources, combined with simplified management and ease of deployment, as key reasons for choosing the technology. Most organizations start small with virtual client computing projects — perhaps as a solution to a departmental or divisional IT issue. Once proven successful in the customer's environment and with the customer's applications, these projects often evolve into a businesswide rethinking and to restructuring of existing infrastructure assets and approaches for corporatewide benefit.

Regardless of the short- or long-term motivation, client virtualization projects should be done only with the appropriate solutions and partners. The risk is too great to do otherwise.

IN THIS WHITE PAPER

This white paper examines client virtualization by explaining what it is, some of the different approaches available today, and the benefits gained from implementing a carefully considered, appropriately sized, and well-managed client virtualization solution.

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SITUATION OVERVIEW

Today, businesses of all sizes — along with educational institutions — are investigating and implementing client virtualization solutions to achieve benefits such as increased manageability and security of their devices, improved flexibility in the types of devices that can be supported, and, for many organizations, reduced IT costs and greater overall efficiencies.

The first step in achieving those lofty goals is critical, but often overlooked: taking the time to learn about and really understand client virtualization. As odd as that may sound at first, there's a good reason for it: Client virtualization can be a complex, somewhat overwhelming subject. To start with, there are several different means of achieving some level of client virtualization, and, in many cases, more than one of these methods are combined to create the finished solution within an organization.

IDC defines four basic types of basic virtual client computing solutions: centralized virtual desktop (CVD), distributed virtual desktop, application virtualization, and virtual user session (VUS). These solutions share an underlying metaphor: the desktop, which is the platform and experience presented to a user. This is not a "desktop PC"; rather, this is the presentation of essential computing resources to the user, and this desktop is subject to the rules of control, access, security, and so on, as defined by the organization.

In a centralized virtual desktop model (also commonly referred to as virtual desktop infrastructure or VDI), a server running virtualization software hosts multiple instances of the operating system (OS), each of which has its own desktop, set of applications, user settings, etc. End users "connect" to these virtual desktops through a piece of connection software, referred to as a connection broker, which assigns each user to his or her own dedicated virtual desktop. The client devices used to access these virtual desktops can be one of several choices, but typically they are traditional PCs, thin clients, or "zero" clients, which are a variation of thin clients that do not have an embedded operating system or persistent settings in memory.

With distributed virtual desktops, the virtual desktop is launched directly on an endpoint, allowing one or more distinct desktops to run on that machine at the same time. Distributed virtual desktops are used almost exclusively with traditional PCs.

Application virtualization solutions leverage the onboard operating system of client devices such as PCs and thin clients but connect to servers that run specialized software that enables applications to be "shared" by multiple different users. The benefit of this approach is that IT departments can easily manage and upgrade the applications without having to upgrade individual client PCs.

In addition, VUS solutions entail specialized virtualization software running on a server that multiple users can access. Unlike CVD solutions, VUS products use a single operating system and "virtualize" desktop sessions for each user, and they also provide each user with his or her own applications, profile settings, and data storage so that the user has a complete desktop experience.

Virtual Client Computing Solution Architectures

The CVD and VUS models of client virtualization operate on the same concept — a server "hosts" the user's desktop, which is then presented to the user. The specific products most commonly used to create a CVD environment are Citrix XenDesktop and VMware View. For VUS, common solutions include Citrix XenApp, Microsoft Remote Desktop Services, and NComputing vSpace.

The specific elements that go into both CVD and VUS solutions are:

- Server-side software, which does the heavy lifting of creating the virtual desktops that individuals log on to
- Connection broker software, which assigns users from individual devices to their own virtual desktops
- Protocols, such as HDX, PCoIP, RDP/RemoteFX, and UXP, which enable the visual display of the virtual desktop to be transmitted from the server down to the client device
- Management software, which allows IT managers to see and actively manage the virtual desktop sessions in their environment
- Access devices, such as thin clients, zero clients, or even repurposed PCs

As mentioned previously, the critical difference between CVD solutions and VUS solutions is how the operating system is used with the virtual desktops. In CVD, each virtual desktop (typically Windows) has a completely independent instance of the host operating system, while in VUS, a single instance of the operating system is used by multiple users, all of whom essentially have their own accounts within that iteration of the operating system.

Each approach has its pluses and minuses. In the case of CVD, because each virtual desktop has its own OS, compatibility can be improved because applications running in the desktop "think" they're running on a standalone PC and only need to support one user at a time. On the downside, the cost and complexity of managing the OS for each virtual desktop for each user can be higher. In addition, most servers can manage fewer CVD virtual desktops than VUS virtual desktops because each CVD desktop typically has higher processing and storage demands than each VUS desktop. For VUS, managing a single OS with shared applications for each group of users is typically easier and less costly because of the higher user densities possible per OS. However, some applications don't run properly in this kind of shared environment because they must be "multi-user aware" (i.e., capable of supporting one user at a time). One of the other big differences between these types of solutions, and across different solutions from the same category, is the degree to which they can scale across environments of different sizes.

Proper Solution Scaling

Large-scale implementations of client virtualization solutions can handle hundreds of thousands of users around the world, providing guaranteed availability and uptime, user platform independence (needed for "bring your own device" [BYOD] capability), and integrated management, monitoring, and optimization tools. Such large-scale implementations usually rely on multiple and dedicated datacenters, staffed by highly trained and capable IT experts and technicians who keep their multinational company's users connected at all times and in all time zones. These implementations involve the highest overall costs, and they are appropriate only for a select few global organizations.

Medium-scale implementations of client virtualization provide most or all of the features listed previously, but they can be located in fewer datacenters or in outsourced facilities. There is likely less need for highly detailed management tools, but there is a requirement for centralized management, and these projects usually have a small dedicated support staff to keep desktops available to connected users.

Smaller-scale implementations and opportunities are extremely common. These environments often adopt client virtualization in specific areas to address one or two clear issues — usually around licenses or software versions — and then grow as reports of the successful implementation results are spread around the company.

It is rather uncommon to see the client virtualization solutions that support global datacenters and thousands of users be successful in smaller-scale implementations. It is much more common to see smaller-scale implementations grow as the company succeeds and as client virtualization benefits drive greater IT resource efficiency. Not surprisingly, the costs associated with solutions designed for larger-scale deployments tend to be more expensive (even on a per-seat basis) than those designed for smaller and medium-sized deployments.

Where's the Server?

One of the important issues that organizations need to address when trying to determine the right type of client virtualization solution involves deciding where the servers hosting the virtual desktops need to reside. In many larger deployments, client virtualization software is installed on local servers and supported by IT at that facility. For businesses with smaller branch offices, however, this type of structure is not cost effective or realistic. Instead, these types of businesses need solutions where the IT support can be at company headquarters or some other offsite location. This gives companies the ability to "compute locally but manage remotely," an important means to enable cost reductions with virtualized client solutions. IT staff can remain centrally located but still easily manage the computing needs of users at many different, potentially far-flung sites. Architecting this type of structure can create a new potential liability, however, which is dependence on the quality, consistency, and speed of a WAN connection. These challenges can be overcome, but they can potentially add cost and complexity to a solution. The key point is to determine not only the right size for the solution but also how that solution can grow as the needs of a company or particular site increase.

Even in the smallest client virtualization environments, the need to provide a connected desktop to users matches that of large-scale efforts. These environments often face the

most severe challenges of "making do" with scarce and limited resources. The small size of these IT environments, though, means that a solution that is capable today for a few users should be able to grow into a solution for many users; otherwise, entire IT architectures may need expensive updates and possibly complete replacement.

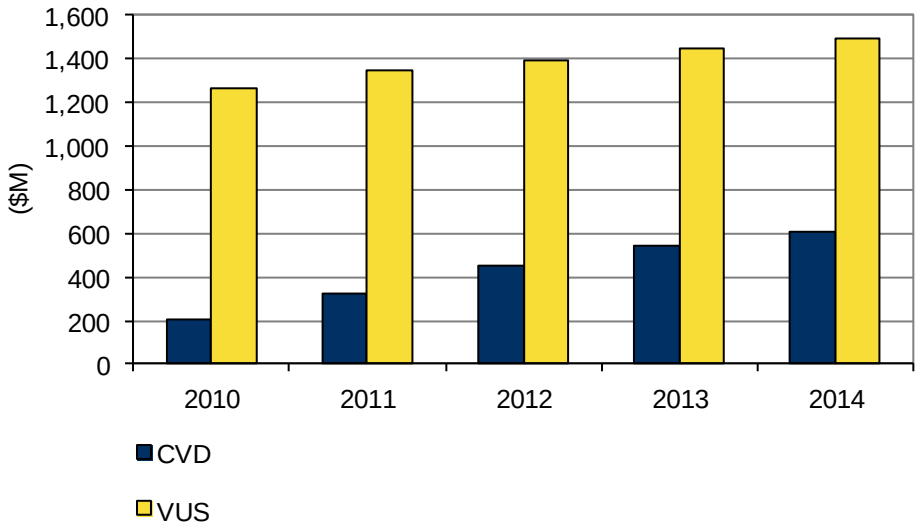
As a result, another critical factor involves selecting software tools that scale from supporting a few users at a single location from an onsite, low-powered server (possibly even just a regular PC) to something that can thrive in a virtualized server environment where each virtual iteration of the desktop hosting software can host large groups of users, all on a single, powerful piece of server hardware. Products such as NComputing vSpace hosting software and NComputing vSpace Management Center provide such scaling and centralized management capabilities in a powerful, unified set of IT tools.

FUTURE OUTLOOK

The future market opportunity for products that offer virtualized client capabilities is strong. According to IDC's research, worldwide revenue for the CVD software solutions market was approximately $207 million in 2010 and is expected to reach $606 million in 2014 (see Figure 1). Worldwide VUS software revenue was $1.3 billion in 2010 and is expected to grow to $1.5 billion in 2014. The reasons behind this growth are many, but they boil down to the fact that these types of products give companies a level of security, structure, manageability, and control within their IT departments that they believe is critical to the ongoing success of their organizations. Companies particularly appreciate the flexibility they have with these solutions, especially in light of the dramatic shifts and changes that have begun to occur in client devices.

FIGURE 1

Worldwide Centralized Virtual Desktop and Virtual User Session Software Revenues, 2010–2014

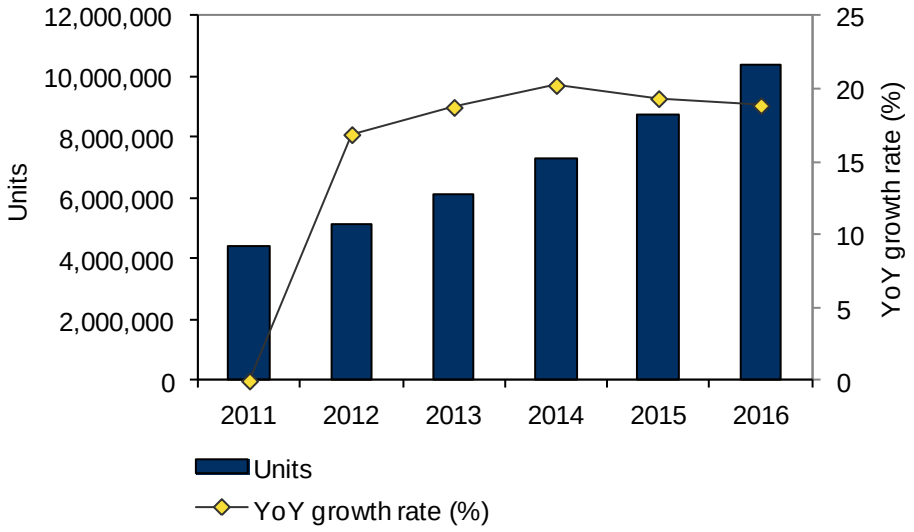


Source: IDC, 2012

Speaking of client devices, we note that thin clients and zero clients typically play a critical role in client virtualization deployments because they were specifically designed to work with these types of software solutions. As Figure 2 illustrates, worldwide thin-client unit shipments are forecast to grow from 4.4 million in 2011 to 10.4 million in 2016, an 18.8% compound annual growth rate (CAGR).

FIGURE 2

Worldwide Thin-Client Unit Shipments, 2011–2016



Source: IDC, 2012

Adoption of client virtualization technologies is moving forward at a solid pace for many different reasons. Fundamentally, organizations are looking for IT solutions that give them flexibility and agility to adjust to rapidly changing demands from Web-based applications and services, increased worker mobility, the BYOD phenomenon, and other important trends that are causing fundamental shifts in how companies need to think about and plan their IT infrastructure.

MEETING THE CHALLENGES

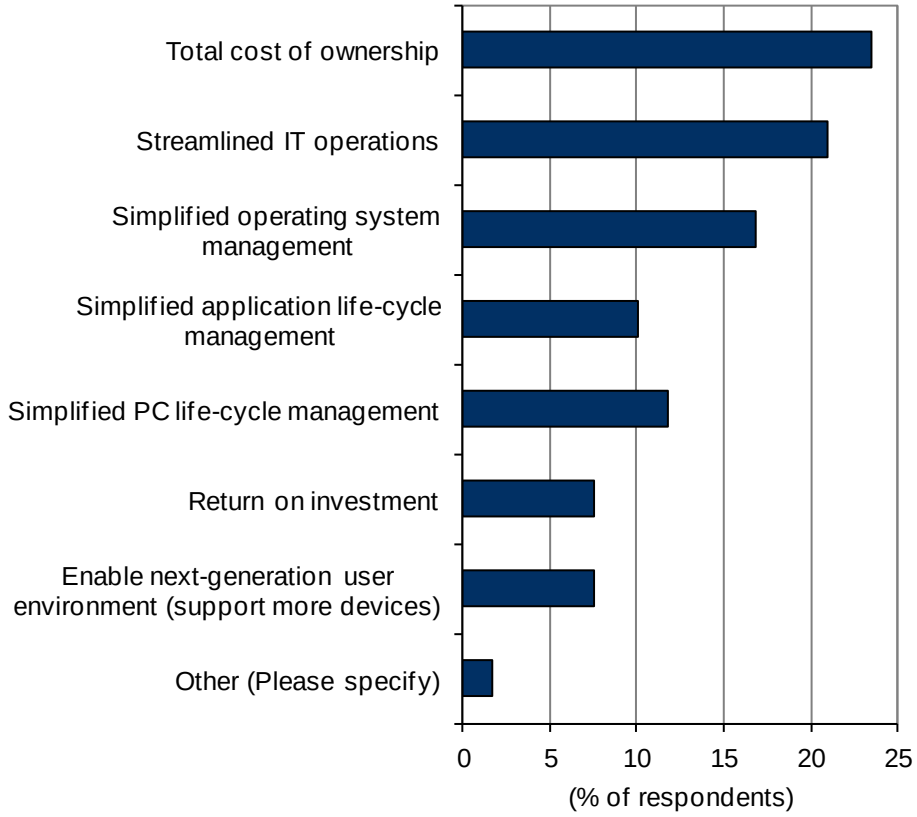
One of the reasons that companies choose to adopt virtual client computing solutions is that the technology can reduce the client costs per user. While the endpoint acquisition costs are typically a wash or even more expensive than those of regular PCs, organizations can reap the benefits of these architectures in the long-term maintenance and support costs. In fact, in a survey of United States–based IT managers who had deployed virtual user session software platforms, IDC found that the number 1 reason people made the deployment decision was because of improved total cost of ownership (TCO). Companies also hoped to benefit from streamlining

their IT operations as well as simplifying the management of their OS environments, applications, and devices (see Figure 3).

FIGURE 3

Reasons to Use Virtual User Session Software

Q. What's the most compelling story that drove you to deploy virtual user session software?



n = 119

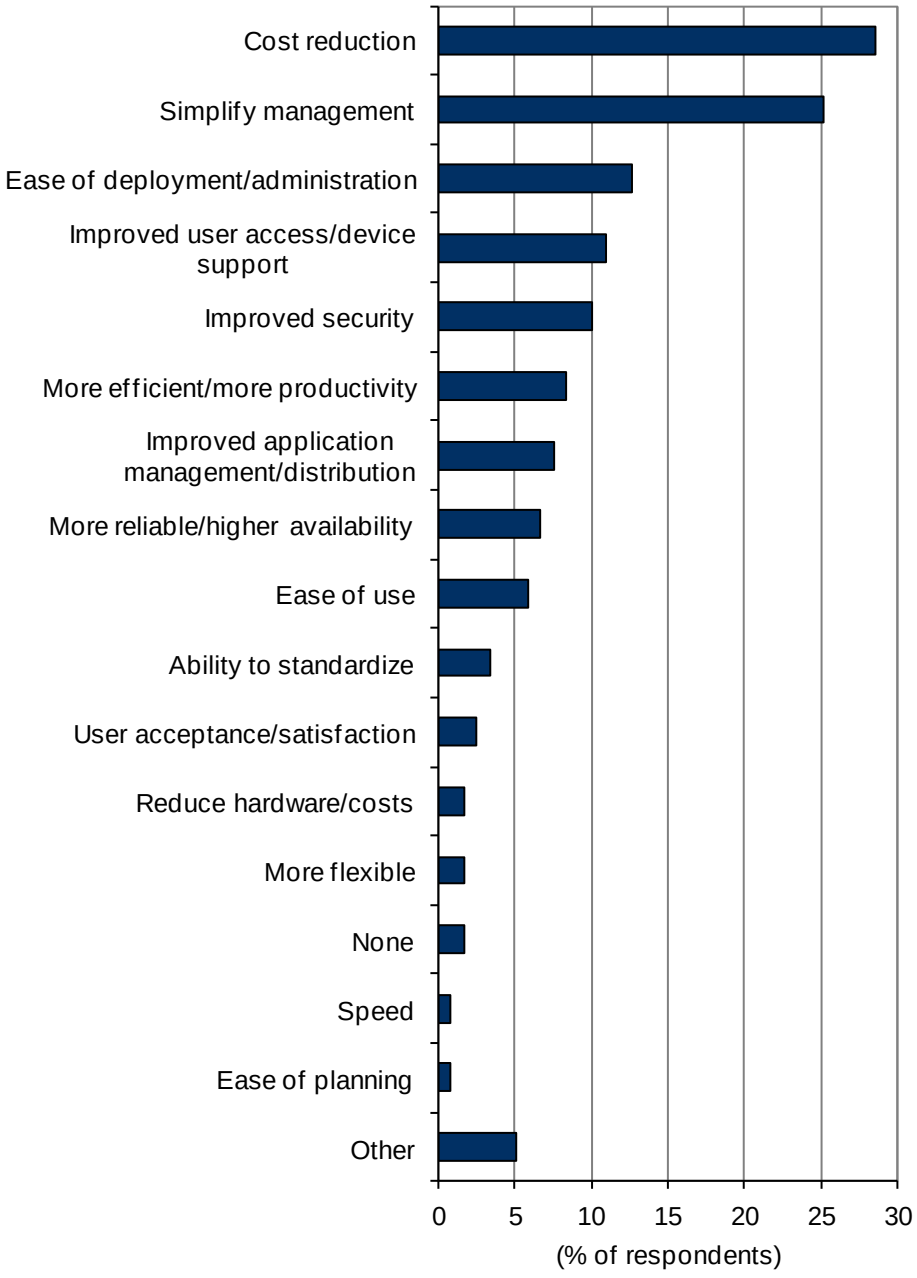
Source: IDC, 2011

Real-world experience also lived up to IT managers' expectations, as cost reduction was cited as the top benefit they realized after deploying VUS software, followed closely by the simplification of IT management of devices, operating systems, and applications (see Figure 4). IT managers also cited the ease of deployment of these solutions as a key benefit, along with improved access for their end users and even improved security for their environments.

FIGURE 4

Benefits of Using Virtual User Session Software

Q. What benefits have you experienced from the use of virtual user session software?



n = 100

Source: IDC, 2011

CHALLENGES/OPPORTUNITIES

The characteristics of virtual client solutions make them very well suited to address certain IT issues. As appealing as the virtualization concept may be, however, the realities of an implementation effort can bring unexpected shocks as the system is implemented. These realities can also surprise users, IT managers, and executives when hoped-for service levels and cost savings do not materialize as expected. It's particularly important for organizations to select a solution that is the right size for their environment.

Many client virtualization solutions are designed for large-scale environments. These global enterprise-class implementations are usually very well planned, with sufficient resources, personnel, and vendor or VAR involvement to meet project commitments for users around the world. More important, though, is the fact that these implementations are done in existing global IT infrastructures, with regional datacenters that already support thousands of users.

The value of client virtualization, though, is not limited to these large-scale environments. Smaller — sometimes much smaller — implementations can lead to expected savings in IT support costs, but they can also provide additional and enhanced capabilities. Consistent OS updates, improved data security, and better use of existing resources are well within the reach of smaller companies.

In any size implementation, the critical issues are still understanding and planning. Understanding the business and the specific cost and value of the virtualization solution in the context of the business is a requirement. The single most important step, though, is planning. This is planning not only the implementation but also how a virtualization solution can grow along with the business.

Defining key limitations and the plan to address those limitations is also a requirement. In some environments, having all users connected to a single VDI server cluster or datacenter is appropriate for the desired service levels and maintenance efforts. In others, having VDI servers distributed locally in regional offices but managed centrally is the best configuration. In others, the implementation plan may call for a "remote server, remote office" solution until the remote office grows to a certain size, and then another approach may be better.

Such implementations need a solution that is flexible enough to offer benefits today and that is capable of growing while still providing those benefits. Solution providers that offer these expansion-capable solutions will be able to understand the needs of the small and growing IT shop and can offer successful and appropriate solutions for today and for the future.

Another concern to be aware of is client performance. Many client virtualization solutions are extremely network dependent and place large demands on existing infrastructure. In addition, some applications are not very efficient in using network space, and when deployed in virtualized desktop environments, they can lead to disappointing client performance. Both of these issues can be easily addressed by enabling the correct amount of network capacity and by thoroughly testing important applications in virtual desktop environments, but they need to be considered as part of the virtual desktop deployment process.

CONCLUSION

For most organizations that are considering virtualized client solutions, the possible benefits are compelling. Greatly improved security, lower end-user support costs, and more efficient IT operations help improve the effectiveness and value of most IT organizations. In addition, lower hardware acquisition costs, reduced energy usage, and longer lifetimes for the client devices also can contribute to bottom-line improvements. In particular, solutions leveraging virtual user session software can offer the most compelling cost advantages, particularly for small and medium-sized businesses.

The overall caution, though, is to do research and analysis before moving ahead with a solution. Many virtualization buyers have found that they have moved their IT capital expenses to their IT operational expenses and haven't achieved any real benefit. That does not have to happen. Instead, by implementing solutions that can accurately match and scale along with a business' needs, IT managers will find that desktop virtualization solutions bring a whole new level of flexibility and capability to their organization that will pay dividends for many years to come.

CASE STUDY

The Flaman Group of Companies

A privately held retailer of agriculture products located in Canada, Flaman started business over 50 years ago as a rural retailer of grain and silage bins. This well-managed firm has grown into a major industry supplier with multiple locations, including eight geographically dispersed retail outlets in the Saskatchewan province.

As Flaman grew, so did the information needs of its executives, managers, and employees. Identifying the requirements was the easy part — accurate sales and inventory information for just-in-time operations, timely accounting and payroll data for cash management and employee compensation, and complete operational data for analysis and opportunity evaluation.

Identifying the challenges was also easy. Bart De Marie is the entire IT staff at Flaman, and he saw the "classic" data management challenges faced by many small to medium-sized businesses. The company's PCs were between 5 and 10 years old, the company workflow had grown up around and was forced to accommodate old and insular line-of-business applications, and there was only De Marie to make the needed decisions and changes.

With no opportunity for a complete forklift upgrade of company IT resources or the necessary training and user support, De Marie turned to client virtualization. By utilizing one small server at each retail location as a desktop virtualization host, De Marie used NComputing products to provide up-to-date and managed connected desktop sessions to the access devices at each retail location. This allowed De Marie to manage all remote servers from his location and to enable the centralized collection of the remote retail data that was critical to the company's growth.

De Marie credited NComputing with being a valuable resource in helping scope the IT problems and compare alternatives. After his successful vSpace desktop virtualization implementation, he has been able to meet Flaman's current and planned future IT needs. De Marie noted that he can now keep one server and a few PCs available as "hot spares" to guarantee uptime and that communications across the company have improved. He also indicated that the client virtualization solution is an energy saver because when he can afford to replace an old PC with a newer thin client, the needed electrical power to support that user drops.

De Marie was clear about how critical it was for him to invest the time and effort to understand the proposed solutions from the participating vendors. He worked through every detail of the implementation, including all application licensing and data communications costs. De Marie determined exactly which of his current PCs would be used where, what server software they each needed at what cost, what access devices are used at each station, what application software they would talk to at what cost, and what management tools he could have at what cost.

This thoroughness helped De Marie make his recommendations to executive management knowing there would be no surprises as he moved forward with his plan. He had done his own research early in the project, and he came to these separate but important conclusions:

- You must clearly define the client virtualization project and its goals.
- You must understand every detail of your current business and IT, and you should know how the company's plans for growth will affect IT needs.
- You must understand every detail of the available virtualization offerings.
- You must understand every assumption, implication, and risk of each of your virtualization short-list options.
- You must pick the appropriate partner.

De Marie is pleased with his chosen NComputing solution for two reasons: It solves his current IT problem at a reasonable cost, and it provides him with a strategy for growth that he can implement — and pay for — only when he needs it.