MICROTEST DISCZERVER TECHNOLOGY:
MARKET PERSPECTIVE AND TECHNOLOGY ANALYSIS

By Marshall Breeding

May 1998
This Spring, Microtest released three new CD-ROM/DVD-ROM networking products, all of which use Microtest's newly developed DiscZerver technology: DiscPortVT, DiscPort2, and DiscZerver. The CD-ROM networking marketplace has changed significantly in the last few years. It has evolved very quickly from one dominated by DOS-based proprietary servers, to the current arena where add-ins to NetWare and NT prevail in the high-end market and CD-ROM network appliances bring this capability to the smaller-scale environments. This report describes the current state of the CD-ROM networking arena, the relative position of Microtest's DiscZerver-based products in this market, and analyzes the technology that underlies this product.

The DiscPortVT is a versatile networking appliance designed to provide shared access to CD-ROM data. This product, primarily targeted at workgroup-level CD-ROM networks, has competitive advantages above other products in this field. The primary advantage of this product over other CD-ROM appliances lies in its ability to transfer CD-ROM data to a magnetic drive built into the unit. The unit's ability to support 100BaseT Fast Ethernet also yields high performance. The DiscPortVT supports all major network types and is easy to install, configure, and manage.

The DiscPort2 follows the same basic design as the DiscPortVT, without the internal magnetic disk caching feature. The DiscPort2 makes it easy to connect a single CD-ROM drive, a chain of CD-ROM drives, a hard drive, or a CD-ROM tower to a network and share their discs among a workgroup. Compared to the DiscPortVT, the DiscPort2 offers less performance capability, but the same features and flexibility at a more modest price.

The DiscZerver allows OEM’s to incorporate this technology into network storage products. It occupies a half-height drive bay and can be integrated into towers that include various combinations of CD-ROM and magnetic drives. The DiscZerver uses the same hardware design and offers the same capabilities as the free standing DiscPortVT.

This paper focuses on the DiscPortVT version of DiscZerver technology.

**Part I: Market Perspective**

**The Need to Network CD-ROMs**

Contrary to some reports, the need to network CD-ROM discs continues to be a major requirement for many organizations. While other media--especially the World Wide Web--continue to grow at even more rapid rates, the need to share CD-ROM-based information has not waned. According to Freeman and Associates of Santa Barbara, CA, CD-ROM, as measured by the number of drives installed, is an ever-growing media. Currently, there are over 160 million installed CD-ROM drives worldwide. The number of drives is projected to reach 185 million by the end of this year, and 210 million by the
end of 1999. These figures demonstrate that CD-ROM continues stand as a primary information delivery media.

The object of CD-ROM networking lies in providing easy access to CD-ROM-based resources to multiple users. CD-ROM remains the dominant media for the distribution of software, documentation, and other types of information. Through a CD-ROM network, the contents of a disc can be shared throughout an organization's computer users. Such a network eliminates the need to physically pass around frequently used CD-ROM discs and provides easy access to vital information. A good CD-ROM network provides security features so that access to these resources can be given selectively to authorized recipients.

The fact that almost all desktop computers come equipped with CD-ROM drives does not greatly decrease the need to network CD-ROMs. While it is possible for individuals to pass around popular discs and use them on each workstation's local CD-ROM drives, this is not the most efficient way to share these resources. It is difficult to keep track of discs when they are shared among many users. With a CD-ROM network users know where to find the information they need and more than one person can use each resource simultaneously.

Sharing CD-ROMs on a network can offer cost savings to an organization. The purchase of multiple copies of a CD-ROM can involve significant costs. Compared to the alternative of distributing access through a CD-ROM network, sharing information by passing around multiple copies of a disc is quite cumbersome. Although many vendors assess additional license fees for multi-user access on a network, these fees are significantly less than the purchase of multiple single-user copies.

**CD-ROM vs. The Internet**

The World Wide Web permeates almost all aspects of computing. An ever-increasing array of information producers now rely on this media to distribute their products and services. But while the Web continues to grow at an incredible pace, the need for workgroup-level CD-ROM sharing continues. There continue to be a very large number of titles that cannot be accessed via the Web, and there is no indication that all information will be distributed in this media. Today, there are many proprietary information sources published on CD-ROM that are not available on the Web. Until many security and authentication issues find better technical solutions, many publishers will continue to use media such as CD-ROM and DVD to distribute their products.

One of the critical issues regarding the use of the Web involves allocation of bandwidth. Most organizations have limits on their Internet connectivity and must make decisions on what resources will be accessed locally and which will be used remotely via the Internet. To conserve bandwidth, it makes sense to rely on the local network for the most heavily used resources, even when both access options are available.
The ability to access multimedia from a CD-ROM shared on a local network offers tremendous performance advantages over loading that same information via the Internet. Consider that even a single-speed CD-ROM offers roughly twice the data throughput capabilities of a 56kbps modem. At about 3.5MB/sec, a 32X CD-ROM drive delivers data with throughput greater than two T1 circuits. For applications rich with multimedia content or where performance is particularly sensitive, the ability to access that information on a local network can be an important benefit. Most organizations will need a variety of access options. Target large and static data sets for local access through CD-ROM or DVD network servers and focus on the Internet for dynamic content.

Given the dominance of the Internet and the Web, it is critical that the organization's local network follow an intranet design. In an intranet, the World Wide Web serves as the primary model for computing, and the Web browser acts as the primary tool for accessing resources, both local and remote. This trend toward the intranet model of computing makes it critical for a CD-ROM server to be well integrated into the Web environment.

**Typical applications:**

Organizations rely on CD-ROM networks to share discs of all types. CD-ROM continues to be an extremely popular medium:

- Almost all software is distributed on CD-ROM, whether it be for network servers, PC's, Macs, or Unix systems
- Most software vendors offer their documentation on CD-ROM rather than hardcopy
- Many information products are delivered on CD-ROM: encyclopedias, reference resources, citation databases, full-text resources
- Government information such as state and federal laws, legislation, and statutes are issued on CD-ROM
- Many organizations rely on vertical markets of large information resources of industry-specific information that are delivered on CD-ROM.
- CD-ROM Recordable (CD-R) is an extremely popular format for storing large data sets. CD-ROM networks can then be used to share these internally created discs.

Consider some examples where a CD-ROM network can benefit the organization:

In programming and technical environments, a CD-ROM can be used to provide access to vendor documentation. Many software vendors rely on CD-ROM as the primary means for distributing documentation. An organization involved in programming or technology support and development could mount CD-ROMs with technical documentation from Novell, Microsoft, and other vendors on a CD-ROM server so that
its technicians would have access to all this information without the clutter of hardcopy manuals or shuffling through stacks of CD-ROM’s. Through a modest effort in setting up a CD-ROM network, one could provide an environment of up-to-date and well organized technical materials to these users.

Many libraries rely on CD-ROM networks. Libraries need to provide access to CD-ROM-based resources such as encyclopedias, electronic indexes, and government publications. Through a CD-ROM network these resources can be made available to the library’s users in a controlled, user-friendly environment.

Legal environments such as law offices, law libraries, and legal research organizations would benefit from the ability to share the many legal resources published on CD-ROM, such as those published by West Group.

A very large number of computer-based training (CBT) products are published on CD-ROM. Schools may want to share these on a CD-ROM network to provide broad access to their students. Many other kinds of organizations can also share these CBT resources for in-house training.

Financial institutions have critical information needs where CD-ROM-based information is at least part of the picture. Morningstar, for example, publishes financial information on CD-ROM that would be critical to share throughout a business in this industry.

**Approaches to CD-ROM Networking: Enterprise vs. Workgroup**

CD-ROM network environments range from those designed to meet the needs of very large organizations to relatively small-scale operations.

**CD-ROM Networking for the Enterprise**

The CD-ROM network for the larger enterprise generally involves a large number of CD-ROM discs that might be shared on a network of hundreds of users. Such a CD-ROM network relies on industrial-strength servers and specialized software for sharing and managing CD-ROM. A typical CD-ROM server for this type of environment would be a fully equipped network file server running an operating system such as Novell NetWare, Microsoft Windows NT, or some variant of Unix. The hardware for these servers would be high-performance network servers with one or more processors, a significant amount of memory, and several towers of CD-ROM drives. Many of these enterprise-wide CD-ROM servers would have significant amounts of magnetic storage available for caching CD-ROM data. A large scale CD-ROM network might include dozens or even hundreds of shared discs, and must withstand the strain of many simultaneous users. These large-scale CD-ROM networks may require significant technical expertise to install and manage. Microtest offers its DiscPort Executive for Windows NT and DiscPort Executive for intranetWare for these markets.
CD-ROM Networking for the Workgroup

Smaller organizations and workgroups within large ones can also implement CD-ROM networks. The main concern with this type of CD-ROM network involves the ability to share CD-ROMs in a simple way that can be managed without network administrators, but that still provide adequate performance for the users of the networked CD-ROMs. The workgroup approach to CD-ROM sharing is usually done either in a small business where there may not be a full-time network administrator, or by a workgroup within a larger organization that needs to share CD-ROM resources independently from centrally provided network services. Workgroup-based CD-ROM networks must therefore be simple to manage and easy to use. In most cases workgroup-level CD-ROM networks can be implemented and managed without the benefit of full-time network administrators.

CD-ROM Network Appliances

A category of products has emerged to meet the needs for sharing CD-ROM information in the workgroup, which we call CD-ROM Network Appliances. Kitchen appliances pretty much work just by plugging them in and can be set up and used without special training. In the same way, CD-ROM network appliances work in some fashion directly out of the box and require little or no configuration or programming. These appliances connect directly to an organization’s network and allow CD-ROM information to be easily shared with network users. A network appliance typically is a small hardware device that has one jack for a network connection and another for connecting one or more CD-ROM drives. The CD-ROM network appliance will generally work, at least in some default way, with little or no configuration effort. How the unit works is largely transparent to its users. All its software is preloaded and pre-configured. The ideal CD-ROM network appliance will work by just plugging it in.

CD-ROM network appliances are not suitable for large-scale enterprise-wide CD-ROM network environments, but they are ideal for workgroup-level implementations.

CD-ROM appliances must work with a variety of network environments. Whether an organization uses Novell NetWare, Windows NT, or Unix as its primary networking environment, the unit needs to work. A good network appliance must operate with the various protocols associated with these standard networks:

- Novell: NCP (NetWare Core Protocol) over IPX (Internet Packet Exchange)
- Microsoft Windows NT: SMB (Server Message Block) over TCP/IP or NetBEUI
- Unix: NFS (Network File System) over TCP/IP

With the current emphasis on intranets, a CD-ROM network appliance must also operate in a Web environment. Network appliances have a built-in Web server, which can be used either for the administration of the unit or to access CD-ROMs, especially those that have data coded in HTML.
Microtest pioneered the CD-ROM networking appliance marketplace in 1993 with its original DiscPort. (See Breeding, Marshall. "Lab Report: The Discport Networking Breakthrough." in \textit{CD-ROM World} 9(3) (March 1994): 60-64.) This product initiated a whole new approach to providing access to CD-ROM information on a network. The original DiscPort allowed one or more CD-ROM drives to be attached anywhere on the network, physically separate from other servers. The DiscPort enabled CD-ROM sharing in workgroups, managed independently from the organization's critical file servers. The original DiscPort had some limitations. It supported only Novell NetWare LANs and required some software to be installed on an existing NetWare server. Microtest's DiscView software provided an advanced, but easy to use, graphical interface for managing the DiscPort and for end-users to access its resources. Subsequent versions of the DiscPort offered improved performance, support for dual SCSI chains, and added support for Windows NT networks. Following on Microtest's market success with the DiscPort, other vendors such as Compact Devices and Axis Communications also developed CD-ROM Network Appliances. The products from Compact Devices and Axis function as completely independent servers, without the reliance on an existing server exhibited by the DiscPort and operate with a wide range of network types and protocols. With the introduction of the DiscPortVT, Microtest offers a CD-ROM network appliance that offers all the features of other products in the marketplace, plus some features that help this unit provide unsurpassed performance and versatility.

\section*{Distributed CD-ROM services}

Installing one or more CD-ROM Network Appliance(s) for sharing CD-ROM resources can help an organization unburden some of its existing network servers. Many vendors, including Microtest, offer software that allows CD-ROM services to be added to existing Novell NetWare and Microsoft Windows NT servers. Although an organization may have existing file servers, adding CD-ROM services to them may require costly upgrades of disk storage and memory, and may interfere with other critical services. The ability to offload CD-ROM services to workgroup-managed CD-ROM network appliances can help an organization to protect its investments in centrally managed servers and save the organization's network administrators from having to manage these ever-changing resources. With a CD-ROM Network Appliance, non-technical staff can take on much, if not all, the responsibility for managing the unit on the network and for loading and changing the CD-ROM discs as they are updated or exchanged for other titles.

\section*{Part II: Technology Overview of the DiscPortVT}

The DiscPortVT falls into the high end of the CD-ROM network appliance arena. The DiscPortVT, like other CD-ROM appliances, provides the ability to share CD-ROM data on the network through a number of network protocols, requires little manual configuration, and is easy to use. But the DiscPortVT contains a number of features not available in its competitors. The DiscPortVT includes a built-in magnetic disk drive which can be used to drastically increase the speed by which users access the CD-ROM
data, allows users to remotely load CD-ROM images into the unit, and supports both standard and Fast Ethernet.

The DiscPortVT takes its name from the concept of a "Virtual Tower." Rather than relying on a physical tower of CD-ROM drives, this approach to CD-ROM networking holds all this information within its internal storage. Users see no difference—other than faster performance—between accessing CD-ROMs from the virtual image within the DiscPortVT versus having the disc mounted in a CD-ROM drive housed in a tower enclosure and connected to a network server.

Microtest packs a large amount of computing power into a very small space. The DiscPortVT, measuring only 9.25" by 6.125" by 2.75", about the size of a box of tissues, is really a complete computer system less the keyboard and monitor. The computer inside the DiscPortVT contains a Pentium-class processor, 16MB of system RAM, an IDE disk controller, a SCSI controller, an Ethernet controller capable of either 10BaseT or 100BaseT, as well as an internal IDE disk drive. Microtest offers two options for disk capacity. Units designed to support a minimum of 7 CD-ROM images currently come with 4.3GB drives and the 14-drive model currently includes an 8.4GB drive. The DiscPortVT has three connectors: one for power, a RJ-45 jack for 10/100BaseT Ethernet, and a 50-pin SCSI interface for optional CD-ROM and/or magnetic drives.

While functionally, the DiscPortVT operates as a CD-ROM appliance, internally it is an advanced network server, powered by Unix. Microtest has created an operating environment for the DiscPortVT from a variant of Unix, specifically customized and optimized for network functions. The DiscPortVT thus relies on an industrial-strength operating system to support its services. The internal operating software of the unit is, however, completely transparent to the end user. One has to look very carefully to even be aware of the unit's internal operating environment. The end user of the product need not know anything about Unix to make effective use of this product. In fact, the DiscPortVT has very tight security and it is impossible for an end user to gain access to the unit's internal operating system.

**Performance Advantages of Caching CD-ROM discs to magnetic Media**

Caching is a computing technique that involves staging data in a faster storage media to boost performance. Lots of computer applications use caching. Inside a computer, for example, the CPU will process active data within its internal cache, which is much faster than the computer’s standard system RAM. File servers improve performance by holding data that needs to be stored in a cache of system memory before it is written to the magnetic drives. File servers hold blocks of data that are read from a storage device in memory so that subsequent requests for the same data can be taken from the cache rather than read from disk. A higher percentage of data available from the memory cache rather than being read from magnetic storage yields higher performance.
With CD-ROM media, performance benefits are gained by caching data to magnetic storage. Magnetic disks offer performance superior to that of CD-ROM drives, both in average response time and in sustained data throughput. CD-ROM drives have achieved remarkable improvements in throughput performance over time—yet even the latest 32X drives cannot match the performance of magnetic storage. The fastest CD-ROM drives have an average response rate of about 100ms, compared to less than 10ms for magnetic drives. The sustained data throughput of a typical CD-ROM drive is at best about 3.5 MB/second, compared to 15 to 20MB/second for a high-end magnetic disk drive.

The caching of CD-ROM data to magnetic is the cornerstone of the design of the DiscPortVT. With this device, CD-ROMs are cached en masse to the magnetic drive inside the unit. Rather than attaching a tower of CD-ROM drives to a CD-ROM server, the VT allows you to transfer the contents of at least 7 discs to its internal drive. From a user’s perspective it will look like the physical discs are mounted in the unit, but in reality they are using images of the discs transferred to this faster media. The ability to cache CD-ROM data to an internal magnetic disk is unique to the DiscPortVT and sets this product above its current competition.

**Cost benefits of using magnetic storage for CD-ROM**

In today’s computer market, it is more economical to use magnetic storage for sharing CD-ROM data rather than investing in multiple CD-ROM drives. Although the costs of CD-ROM drives have fallen dramatically, the cost per MB of magnetic storage is still the better bargain. Consider the following. A 24X SCSI CD-ROM drive (Toshiba XM-1702B) currently costs about $159. At a maximum of 660MB per CD-ROM disc, seven drives yield a total storage of about 4.5GB at a cost of $1,113 ($0.24 per MB). One can currently purchase an 8.4GB IBM drive for $247 ($0.029 per MB). Magnetic storage costs about 2.5 times less than CD-ROM storage and offers dramatically superior performance. When you factor in the cost of power supplies and a tower enclosure needed to house the CD-ROM drives, the cost savings are even higher. Physical CD-ROM towers compare negatively to cached CD-ROM images from both a cost and performance perspective. We can expect that the use of CD-ROM towers will decline as it becomes increasingly more cost effective to transfer data to magnetic media. The DiscPortVT, with its image caching design, fits well into this technology trend.

**Remote load of CD-ROM images**

One of the best features of the DiscPortVT lies in the ability for the CD-ROM images to be transferred to the unit remotely. This allows the person who manages the unit to simply place a CD-ROM disc into the CD-ROM drive of any client computer on the network, and invoke the EazyImage software to transfer its contents across the network to the DiscPortVT.

Because of this remote load capability it is not necessary to have any CD-ROM drives connected to the DiscPortVT. Since most desktop computers come equipped with CD-
ROM drives, it is generally much more convenient for the person managing the VT to load images in this way than to have to access the unit physically to maintain its resources.

Alternately, one can attach up to 7 SCSI CD-ROM drives to the 50-pin SCSI connector on the DiscPortVT. With directly connected drives, users can access the discs in the CD-ROM drives, or their images can be transferred to the internal magnetic drive. In addition to the EazyImage software that Microtest provides for loading CD-ROM images from a workstation's CD-ROM drive, one can load CD-ROM images to the internal hard drive from CD-ROM drives directly attached to the DiscPortVT.

**Web-based Administration**

As a product designed for an intranet architecture, the DiscPortVT is managed through a Web-based interface. To manage the unit, one simply points a web browser to either its IP or WINS address. The DiscPortVT will then present its initial page, offering the ability to perform administration functions or to browse the contents of any images that have been transferred to the unit or discs loaded in its CD-ROM drives. All the configuration options can be set through this Web interface. The various options are broken into categories, and drop-down selections or fill-in boxes are presented in the respective web forms. Many of the changes can be activated by pressing the submit button, others require you to reboot the unit.

**The DiscPortVT is an Independent Server**

The DiscPortVT offers a significant advancement in network architecture beyond the original DiscPort products. The original DiscPort began the category of CD-ROM network mini-servers. It allowed one or more CD-ROM drives to connect to its built-in SCSI port, and the DiscPort connected directly to the network. While the CD-ROM drives connected to the network are physically independent from other servers on the network, there was a logical association made with existing NetWare servers. For the original DiscPort to operate, the DiscView NLM (NetWare Loadable Module) software needed to be run on an existing NetWare server. From the network user's perspective, it appeared as if the DiscPort's CD-ROM drives were connected to that NetWare server. From a network architecture perspective, the data from the CD-ROM drives first had to travel to the server before being sent to the user's computer. While the performance of the original DiscPort was surprisingly fast, network administrators were troubled about the fact that CD-ROM data ultimately traveled the network twice.

The DiscPortVT operates as a completely independent network server, eliminating the data flow inefficiency of the previous generation of DiscPorts. CD-ROM data from the DiscPortVT passes directly to the client stations without the intervention of any other network server.
Though architecturally the DiscPortVT is an independent server, it integrates with the existing network environment. The DiscPortVT can be directed to take advantage of users defined on an existing NetWare 3.x bindery server or with a Windows NT server. The ability to leverage existing authentication definitions is an important feature from a network administrator’s perspective. Users created in the Novell NetWare bindery or in an NT Domain, need not be manually recreated. Rather, the DiscPortVT can be configured to validate a user’s name and password through the existing network environment. In cases where such integration issues do not apply, users and groups can be created directly within the DiscPortVT.

**Network Performance: Standard and Fast Ethernet**

The DiscPortVT comes with a built-in RJ-45 jack that will support either 10BaseT or 100BaseT Ethernet. With this type of network support, the DiscPortVT is well equipped to deliver excellent network performance. Since the DiscPortVT relies on magnetic storage for its CD-ROM images, the ability to support 100BaseT Ethernet is an important feature. With standard 10BaseT, the performance capabilities of the magnetic drives could exceed the network interface’s ability to deliver the data. With 100BaseT, the network throughput is less likely to be a constraining factor.

**Network Integration Issues**

The DiscPortVT operates in a variety of network environments. It will integrate smoothly into Novell, Microsoft, and TCP/IP networks. For each of these network types, client computers use the same techniques to access resources on the DiscPortVT as they would other network resources. No specialized client-side utilities are required. In the following section, we consider how the DiscPortVT integrates into each of the major network types.

**TCP/IP**

To participate in a TCP/IP network, there are several important configuration details. The device must have an IP address assigned, have the proper network mask specified, and IP addresses set for the default gateway and DNS (Domain Name Services) server.

While Microtest provides several approaches to establishing these configuration details, this remains the trickiest part of making the DiscPortVT operational. If your network already has a DHCP (Dynamic Host Configuration Protocol) server or a bootp (Bootstrap Protocol) server available, then you can easily configure the TCP/IP settings. To use either of these automatic configuration procedures, you will need to provide the Ethernet address of the DiscPortVT (written on the bottom of the unit) to the administrator of the DHCP or BootP server. They will then enter this address into their server so that it will respond to the request that the DiscPortVT issues when it starts. Both DHCP and BootP are capable of assigning all the TCP/IP network configuration options. If neither of these
configuration services are available on your network, Microtest provides some manual procedures for configuring the device.

In a TCP/IP network, you can access CD-ROM images on the DiscPortVT several ways. One could access individual files through FTP. Using FTP, each of the CD-ROM images shows up as a directory, in which individual files could be transferred to the client’s computer. A more useful approach is through NFS. Any computer equipped with an NFS client can mount the CD-ROM images on the DiscPortVT as exported file systems. Users can also use a Web browser to access the CD-ROM images. This approach is most useful for CD-ROMs that contain HTML-encoded information.

**Novell NetWare**

In a Novell NetWare network environment, the DiscPortVT appears as a standard NetWare 3.x server. Users can attach to the CD-ROM images in the DiscPort using the same techniques that work for other NetWare resources. The standard “MAP” command can be used to assign a drive letter to a networked CD-ROM, or one can use the graphical utilities, such as “Network Neighborhood” to navigate to the drive.

NetWare administrators will see the DiscPortVT shows up as an additional NetWare 3.1x server. The DiscPortVT follows standard NCP (NetWare Core Protocol), and uses IPX (Internetwork Packet eXchange) as its network transport protocol. Other NetWare devices detect the presence of the DiscPortVT through SAP (Service Advertising Protocol). The DiscPortVT can rely on an existing NetWare 3.11 server to perform authentication functions, or one can define users manually. While the DiscPortVT does not require any other NetWare servers to operate, it can leverage the user and security information already defined on existing servers to avoid duplication of effort.

To function as a NetWare server, any device must have certain configuration details established. Specifically, one must specify a name for the server, select the proper Ethernet frame type, use the correct physical IPX network number assigned to that network segment, and assign a unique internal IPX network number. The DiscPortVT without any intervention will sense the Ethernet frame type and physical external IPX numbers and will assign default values for the server name and internal IPX network number. The manager of the DiscPortVT can later change the name of the server if the default name is inconvenient. Thus, from a Novell NetWare perspective, the DiscPortVT should work in some way with no required configuration tasks.

**Microsoft Networking**

To operate in a Microsoft Networking environment, the DiscPortVT appears as disk shares within the specified Domain. The shares that represent the DiscPortVT can either be defined in their own Domain, or can be configured to participate in an existing one. While the DiscPortVT upon initial installation operates under a pre-assigned default resource and domain names, you can define your own name and specify the correct Domain through the Web-based configuration utility. Since the DiscPortVT uses TCP/IP
as the underlying protocol for its Microsoft Networking approach, then its IP address
must also be assigned. Users can easily access the CD-ROM images on the DiscPortVT
by navigating to them under Network Neighborhood utility in Windows NT or Windows
95. The Net Use commands can be used to assign drive letters to the DiscPortVT as a
whole, or to individual CD-ROM images. Any of the network environments that rely on
SMB can access the DiscPortVT in this way, including Windows NT, Windows 95,
Windows 3.x, and OS/2 Warp. Similar to NetWare, the DiscPortVT can take advantage
of users and groups defined in the existing NT Domain, saving the effort of manually
defining a set of users for this device.

Conclusion

The DiscPortVT is a major advancement in the evolution of CD-ROM Networking
Appliances. It's well-positioned for small and medium-scale CD-ROM networking
implementations. This product, with its advanced internal operating environment, built-
in disk caching, and 100BaseT networking capabilities can tackle larger CD-ROM
networks than were previously practical with CD-ROM networking appliances.
Organizations that need to implement shared access to CD-ROM-based resources will
find the DiscPortVT to be an excellent solution.
About the author

Marshall Breeding, in addition to his position at Vanderbilt University as the Technology Analyst for the Jean a & Alexander Heard Library, is a freelance consultant, writer, and analyst. He specializes in CD-ROM networking and regularly covers this topic for DataPro Information Services group. He has written for publications such as Network Computing, CD-ROM World, Library Hi-Tech, and Computers in Libraries. He is Editor-in-chief of Library Software Review. He has authored three books including: TCP/IP for the Internet: The Complete Buyer's Guide for Micro-based TCP/IP Software. He edited Mecklermedia’s Official Internet World World Wide Web Yellow Pages (1996 Edition), and the volume Library LANs: Case Studies in Practice and Application. For more about the author see http://www.library.vanderbilt.edu/libtech/breeding/home.html.