

Thin Client Computing: Windows 2000 and NCD ThinPATH

By Blaine Branchik

Terminal Services is an integral part of Windows 2000 that, through server-based applications and centralized control, can ease deployment and management of applications in networked environments. NCD ThinPATH software complements Windows 2000 by enabling organizations to maximize the benefits of deploying Windows 2000 Terminal Services through its enhanced functionality and powerful centralized management tools. This article describes the features of the NCD ThinPATH family of software and how it complements Windows 2000.

Many organizations are deploying applications on network-based servers accessed by thin client desktops. This way of computing is being driven by the universal use of Internet standards, and the simplicity and cost savings afforded by thin client computing. With the introduction of Windows 2000, Microsoft has endorsed this paradigm by including Terminal Services in all server versions of Windows 2000, which enables applications on networked servers to be deployed, run, and managed centrally.

NCD, already the leader in thin client desktop devices, introduced the NCD ThinPATH™ software family that enhances and complements various functions of Windows 2000. Together, Windows 2000 and NCD ThinPATH provide a fully functional, cost-effective, and easy-to-manage thin client computing environment.

Thin Client Computing Approach

Thin client computing is enabled by the multi-user access capability of Windows 2000 Terminal Services by which networked desktops access applications on networked servers. This helps organizations better manage their enterprise desktop users and lower the cost of ownership of IT resources

because of centralized deployment and support of desktops and applications.

Thin desktop devices are low-cost devices optimized to perform network-based display processing. They can be PCs or other desktops that use thin display protocols. Terminal Services allows these desktop devices to access applications that reside and operate on network-based servers in various environments including Windows, UNIX, or legacy systems. Figure 1 shows an example of thin client computing.

Thin client computing deployments typically involve departments or workgroups in a variety of task-based environments that tend to employ a limited number of applications, but use them regularly throughout any given day. These workgroups may include administrators, accountants, customer service representatives, telemarketers, and others.

Industries that are using thin client computing include health care, retail, education, and banking. Application service providers (ASPs) also look to thin client computing for deployment of their hosted applications. Figure 2 describes some of the benefits realized through thin client computing.

Windows 2000 Terminal Services

Microsoft first recognized the benefits of thin client computing in 1993 by licensing Windows NT technology to Citrix Systems to create a multi-user version of Windows NT. In 1997, Microsoft affirmed the thin client paradigm by introducing Microsoft Windows NT Server 4.0, Terminal Server Edition (TSE), a multi-user version of Windows NT Server 4.0.

The Windows 2000 family has four separate versions: Professional, Server, Advanced Server, and Datacenter Server. Microsoft has integrated Terminal Services and its thin client computing capabilities into each server version and also enhanced the capabilities of the previous TSE. Figure 3 summarizes some key thin client computing features of Windows 2000 Terminal Services.

NCD ThinPATH Enhances Terminal Services

NCD ThinPATH is a family of management, desktop support, and emulation software for Windows 2000-based servers, PCs, and NCD ThinSTAR™ Windows-based terminals. Over two million users access applications using NCD thin client software.

NCD ThinPATH software complements Windows 2000 Terminal Services by enhancing key functional areas, such as local peripheral support and mirroring desktop sessions, regardless of operating environment. Several key capabilities include:

- **Load balancing:** NCD ThinPATH Load Balancing is specifically designed for thin client computing by centralizing the

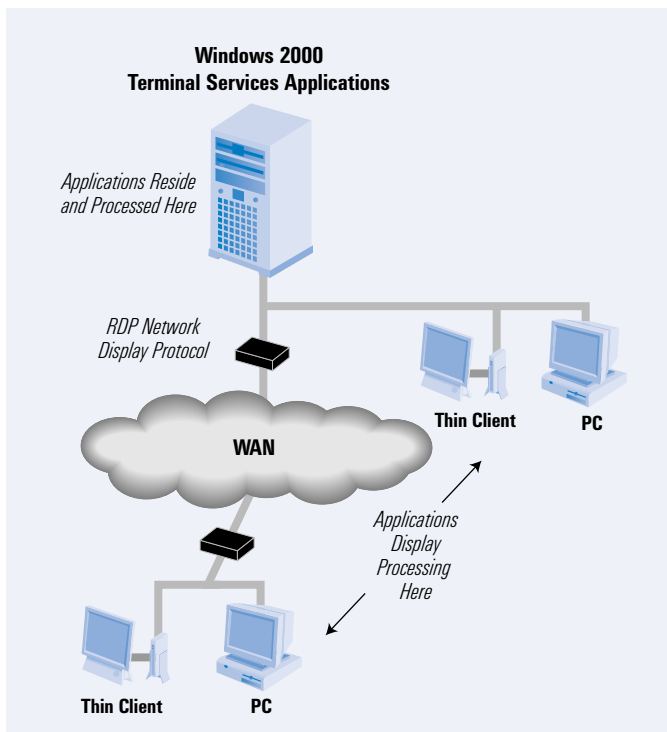


Figure 1. Thin Client Computing

BENEFITS OF THIN CLIENT COMPUTING	
Benefit	Function
Streamlined management	Centralizes all applications and most computing resources in network-based servers for easy network administration
Lower cost	Reduced cost of acquisition, installation, and support due to the simplicity of the device, plug-and-play installation, and centralized support
Peak resource access	Makes all appropriate network-based resources available to all desktops quickly and easily
More efficient peripheral usage	Enables all network users to share high-speed servers, disk storage, and peripherals
Easier upgrades	Simplifies application and hardware upgrades on shared network servers
Higher reliability	Makes client desktops less prone to user application problems because of centrally managed applications

Figure 2. Benefits of Thin Client Computing

- server configuration function and simplifying user application access.
- **Remote control:** NCD ThinPATH Desktop Mirror enables an administrator to view the complete user desktop and any operating systems or applications that are running on it, not just a single Windows 2000 session.
- **Local parallel port support:** NCD ThinPATH Plus supports both local serial and parallel ports. This affords support for industry-specific applications and peripherals, such as voice recognition for health care, fingerprint recognition for security, and smart cards.
- **The Client Connection Manager:** This publishing feature of NCD ThinPATH Load Balancing enables applications to be set up for entire workgroups at one time, which saves administration time.

Load Balancing: NCD ThinPATH vs. Windows 2000

Load balancing enables clients to connect to a pool of Windows 2000-based servers. This eliminates single points of failure and provides scalability and optimal performance. The NCD ThinPATH Load Balancing enhancements over Microsoft Windows 2000 Advanced Server load balancing result from a fundamental difference in the design approach and the targeted use.

Load balancing provided in Windows 2000 Advanced Server is focused on a seamless farm of identical servers that provide specific functions, such as those needed with Web servers. User requests are directed to a server within a group

based on the order of the event. The next user is directed to the next server in line, and so on. No real-time data on the server or its capacity is used to determine the mapping of the user request.

NCD ThinPATH Load Balancing, on the other hand, is designed for use in the thin client environment to provide the best available session performance. The use of the server will be influenced by the user actions of their application programs that are running on the server, not by fixed transfers of information over the network that would occur in a transaction-oriented system such as an SQL or Web server.

Because of the dynamic nature of Windows applications, NCD ThinPATH Load Balancing must factor in several performance indicators to predict user response time. These factors include the number of current user connections to each server, amount of available memory, system swap activity, and the number and performance of the server processors. When the user establishes a server connection, these factors are synthesized into a specific load factor that is used to predict system performance.

Enhanced Usability

The design of Windows 2000 Advanced Server load balancing focuses on the network administrator's point of view by

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grouping servers into a single network address. NCD ThinPATH Load Balancing also eases the desktop management of the user. With NCD ThinPATH Load Balancing, users simply select a server or application from a predetermined list that identifies the desired application by name through a feature known as Application Publishing. However, with network-centric Windows 2000, users must know the network name of the server group they want to access and which application runs on which groups.

Enhanced Administration

Again, design differences require that administrators set up and manage server groups differently with Windows 2000 Advanced Server and NCD ThinPATH. With Windows 2000 Advanced Server, every server in a load-balanced group must have two IP addresses: one unique and one shared. NCD ThinPATH Load Balancing does not require these two addresses. Also, two network cards are recommended for Windows 2000 on a load-balanced server, but are not needed with NCD ThinPATH Load Balancing.

Administrators using NCD ThinPATH Load Balancing can perform management tasks for a server group from one centralized server location using a graphical administration tool. Those using Windows 2000 Advanced Server load balancing must

KEY FEATURES: WINDOWS 2000 TERMINAL SERVICES	
Feature	Description
Local printer support	Desktops accessing applications on the Windows 2000 server can print to local printers.
Roaming disconnect mode	Users can disconnect from a session without completely logging off. When they reconnect, they are taken back to the application where they disconnected, rather than having to log on again.
Multiple login support	A single user can have multiple logon sessions from one or more desktops.
Remote control	Help desk staff can view or control a user's Windows 2000 remotely, which is useful for training and support.
Network load balancing	Available with Windows 2000 Advanced Server and Datacenter Server, it enables clients to connect to a pool of Terminal Services servers, eliminates a single point of failure, and provides scalability.
Client Connection Manager	This tool allows administrators to set up predefined connections to applications running on one or several separate servers. This eases user access to applications running on various servers by allowing connection to applications on various servers without having to log on to each of them.
Terminal Services Manager and Configuration	Administrators use these utilities to set up and monitor clients.
Remote Desktop Protocol (RDP) encryption	RDP is the network display protocol used by Windows 2000 to display applications being processed on shared servers. RDP encryption provides multiple security levels of display information as it is sent over the network.

Figure 3. Key Features: Windows 2000 Terminal Services

WINDOWS 2000 TERMINAL SERVICES AND NCD THINPATH MAKE THE GRADE

Although better known as one of Britain's most popular seaside resorts, Bournemouth is also developing a reputation as the location for one of the country's most successful universities. Along with a track record as an innovator in education, Bournemouth University's IT department prides itself on employing innovative technology.

With almost 3,000 computers and a student demand for access to the Web and a wide variety of applications, the IT department faced a real challenge: It needed to control costs, yet increase the reliability of the system and ease the administration. The university tested several thin client multi-user solutions, such as NTrigue® and Citrix WinFrame, using terminal sessions. Although the solutions were partially successful, the experience was not uniform and the university discovered

scalability, stability, and reliability problems with these solutions in their environments.

The IT department then turned to thin client technology using Microsoft Windows 2000 Terminal Services and NCD's ThinPATH Load Balancing software. This approach allowed the university to leapfrog a technology gap—from Windows 3.1 and Word 6.0 to a university-wide thin client network using the latest Windows 2000 capabilities—without the traditional heavy investment in feature-heavy, costly PCs and workstations.

Today, the university provides students with fast, reliable, and affordable access to a variety of applications through the use of Windows 2000 Terminal Services and NCD's ThinPATH software.

work with each server in the server group individually, using standard Windows 2000 administrative tools.

Enhanced Packaging/Cost

Windows 2000 load-balancing functionality is available only in two versions of the Windows 2000 family: Advanced Server and Datacenter Server. NCD ThinPATH Load Balancing supports any version of Windows 2000 or Windows NT Server 4.0, TSE.

Since NCD ThinPATH Load Balancing supports both TSE and Windows 2000 Terminal Services, it can provide identical functionality before and after migration from TSE to Terminal Services—a strong recommendation for those considering migration.

NCD ThinPATH Desktop Mirror

The remote control feature of Windows 2000 Terminal Services enables the system administrator to see a user's single Windows 2000 session on the administrator display. NCD ThinPATH Desktop Mirror includes the entire client desktop, not just a single Windows 2000 session. Whether that encompasses multiple sessions from Windows 2000, another Windows version, or a local emulation session, the administrator sees the client desktop exactly as the user sees it.

This Desktop Mirror capability allows system administrators and technical support engineers to provide more effective troubleshooting and user support. It also is ideal for administering unattended displays, such as information kiosks.

NCD ThinPATH Plus

NCD ThinPATH Plus augments the Windows 2000 Terminal Services support for local peripherals. While

Windows 2000 supports local parallel ports, NCD ThinPATH Plus supports both local serial and parallel ports. Using ThinPATH Plus, retail organizations can support serially attached barcode readers or cash drawers. It also permits banks to perform fingerprint verification using biometric devices.

NCD ThinPATH Plus is the only software that supports audio input and output, enabling voice recognition applications and online training, adding significant capabilities to thin client computing.

Moving to Windows 2000 Terminal Services

Many users of Windows NT Server 4.0, TSE will be migrating to Windows 2000 Terminal Services. With support for both TSE and Terminal Services, NCD ThinPATH provides identical capabilities on both, thereby making the migration from Windows NT Server 4.0, TSE to Windows 2000 much easier for users and administrators.

Optimizing Your Network

Windows 2000 Terminal Services with NCD ThinPATH provide organizations the opportunity to implement thin client computing in their networked environments at the lowest possible cost and as easily as possible. These products complement each other, resulting in easier to manage, lower cost, more reliable networks.

For additional information, see www.microsoft.com/windows2000 or www.ncd.com/thinpath. ♦

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