

Getting started with Win2000

PART 3: RESURRECTING OLD HARDWARE



Win2000's terminal services enable you to have a fully-featured Win2000 desktop running on out-of-date machines. Peter Guthrie shows us how

Terminal Services is what is generically known as Network Computing. It's one of the examples of the computer industry going full circle in the technology it creates. Some of the earliest computer networks (those ones with green screens) employed network computing, where processing is done almost exclusively on the server and clients (or terminals) simply redraw screens, and send keystrokes and mouse clicks.

Network computing enables you to remove permanent and temporary storage devices from a PC and operate with very little processing power, yet still deliver a full desktop environment to network clients.

By performing most of the processing on the server, clients need far lower specifications, and many of the variables in a PC that increase failure rates (such as hard disks, floppy disk drives and CD-ROM drives) can be eliminated from the client machine. With the server in charge and checking all input on the client machine, you can remove such network bugbears as viruses and resource hungry applications such as games.

In the last few years, organisations have been discovering the impact of Total Cost Ownership (TCO) of computer systems. TCO involves more than just the purchase cost of machines and software. It involves maintenance, technical support, upgrades and downtime costs. All of these contribute to the complete cost of an Information System over its lifespan and mount up to many times the purchase cost.

As clients are 'thinner', costs are kept to a minimum and manageability is far greater.

You can deploy a number of applications via Terminal Services, though for many you'll need a special license to make them work. While each user will have a tailored profile, you can create a standardised set of applications to provide a consistent, manageable environment for any user.

It works through emulation, with the client simply 'drawing' a screen fed to it by the server. Applications run entirely on the server and only keystrokes and mouse clicks are fed back.

Sounds like one of those antique green screen devices? Well, the idea's the same – but it runs a fully featured Windows desktop.

Out with the old and er...

Terminal Service breathes new life into all those old machines lying around the office. Before throwing that Pentium 120 with 16MB RAM away, look at what Terminal Services has to offer – you can turn it into a fully featured Win2000 desktop for about 15MB extra RAM on your server machine.

Because Terminal Services puts almost all the processing into the hands of the server, the client can be virtually any specification. While it's less practical to do animation, CAD or other processor-heavy applications, standard office applications and SAP are ideal. Applications such as Microsoft Office (from version 95 upwards) run as fast (or in many cases faster) than a standard desktop machine.

Terminal Services also enables you to integrate other platforms more tightly into your network and run standard Windows

applications through a session on the server. You will need some add-on software to use those platforms, but software like Citrix Metaframe 1.8 is relatively inexpensive and adds to the flexibility and speed of your system. See the box *Citrix Metaframe and third party add-ons* opposite.

Citrix Metaframe enables you to 'publish' applications to any client.

The two modes

There are two modes of Terminal Services in Win2000: Remote Administration and Application Server.

With Remote Administration, the entire system can be administered externally, so if you are building a network for an external site without WAN capabilities, you can still administer the network. Or if you've hired a reseller to deploy your network, they can administer it without those costly call-out fees.

All you need is a TCP/IP connection and the service enabled on the Win2000 Server in question. You can even edit the registry and start and stop most tasks accessible from the console. Most of the Terminal Services environment is not installed with this option as it only needs a terminal environment to be delivered to the few client machines with access to Server applications.

Application Server follows a more traditional network computing model, enabling you to deploy and manage applications from a central location. Use Application Server when you want finer control, easier administration and improved manageability over the applications your clients use. Clients can connect and use both applications and data over remote access, LAN or WAN connections from Win95/98/NT/2000/CE and even non-Windows based clients.

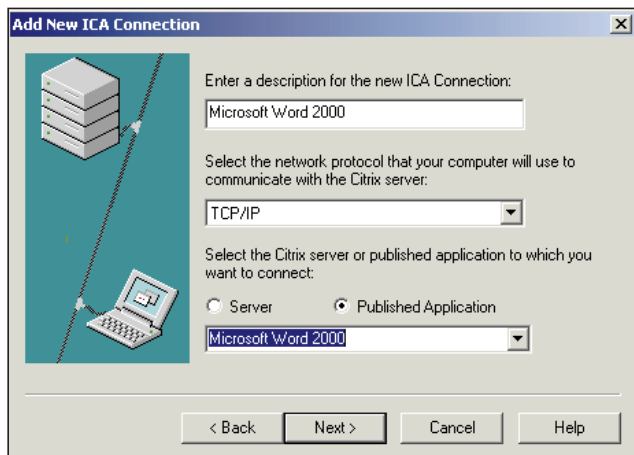
You need to have Terminal Services licensing enabled when you deploy an Application Server, which involves contacting Microsoft for a key (this is handled by a wizard that takes you through the process). The client gets a license key to access Terminal Services resources.

With Application Server mode, applications run entirely on the server, making it so only one machine needs a full level of support.

Remote access

A major benefit of Terminal Services comes when you have remote clients on the road. You can make the client 'thinner,' a perfect option is a CE device such as an HP Jornada, while still retaining the usability and features of a mobile computer. A CE based device is far cheaper not only to buy, but also to support, so TCO can be vastly reduced for mobile users.

Through an external TCP/IP connection, you can get fully featured Windows desktops, including access to legacy applications and



databases on to even a WinCE-based device without using a massive bandwidth. The only information transmitted is the screen from the server and keystrokes and mouse clicks from the client. A 56k modem is plenty to get Microsoft Word, Access or Outlook working through a terminal connection.

With security handled by Win2000's integrated security infrastructure, it's easy to implement and distributes standard applications to a client located anywhere across the globe.

Too good to be true

Sounds wonderful, right? It is. But unfortunately there are a few hitches in its implementation. We had no end of problems with our evaluation copies, but learn from our mistakes and the chances are you won't.

Follow Microsoft's advice. Don't install Terminal Services on a Domain Controller. Microsoft says that it's for performance reasons and, to be fair, it does make much bigger dent on a DC than other servers. But there are also a myriad other reasons to do with permissions and networking.

We had days of heartache (and so did Microsoft technical support!) trying to get it all to work on our standard installation. Eventually we did the sensible thing – we gave up and started again from a clean install.

Take our advice and get a second server, particularly if you're running Active Directory. It'll cost you less than replacing all your legacy clients, and it makes a lot of sense to run fat and thin clients from separate servers anyway.

Though you can run it from Win2000 Server, if you are going to have a lot of clients, you may want to consider Win2000 Advanced Server and take advantage of the clustering and load balancing capabilities it offers.

The other major issue we faced was licensing. Contrary to what you may think, you don't actually get any Client Access Licenses (CALs)

HARDWARE COMPATIBILITY

What hardware do I need?

Specifying hardware for a network is always a tricky process, but even more so with Terminal Services

There are two major considerations when looking at hardware compatibility: the server and client specifications. Each is dependent on the type and number of applications distributed.

You need to carefully analyse the applications that are being delivered and how much processing time they will take up on the server. For example, distributing Microsoft Word 2000 to a network of 50 thin clients using the software constantly will take up a lot of CPU time and a lot of memory (not to mention network bandwidth).

Microsoft specifies three types of clients: light users, structured task users and power users. A light user runs a single program at a time, such as a terminal to a Visual Basic application, or a Word-only terminal. A structured task user

will use two or more applications, but doesn't multi-task or frequently switch between applications. A power user is a sophisticated computer user that runs more than three applications at any given time and puts a high data processing demand on the server.

To use Terminal Services, your server needs a base of 128MB RAM, plus 10MB for each light user and about 20MB for power users. In our tests, we had a server with 256MB RAM serving seven medium to power clients without any problems. A 3Com Gigabit Ethernet card in the server fed a 3Com Superstack II switch with a gigabit module. This vastly increased the bandwidth the server could use and had a very positive effect on performance.

The client machines are far less important than the server.

Very little activity beyond keystrokes and mouse clicks are processed by the client, though if multimedia is to be used, it makes sense to give the client a bit more RAM and processing power.

Our clients included a Pentium 120 notebook with 48MB RAM running Win2000 Professional, some dedicated thin client devices like NCDs new ThinSTAR 400 and Wyse Technology's new 3320SE, and even a 486DX50 with 16MB RAM. All performed fine, though the 486 was a little slow with multimedia.

The clients we used demonstrate two of the major client types for Win2000 Terminal Services: those who use older machines to gain some life from them, and new machines purchased for their very low Total Cost of Ownership and purchase price.

out of the box. You need to buy them separately from a Microsoft reseller.

You can trial Terminal Services for 90 days without enabling a licensing server. Take advantage of this and don't install the license server until you're sure you want to use the system. See *Installing Terminal Services* for more.

Sound more hassle than it's worth? Don't be put off. If you have older clients, or are concerned about what the cost of ownership for

your network will be, it's a highly competent system and a great deal better than NT 4.0 Terminal Server.

Terminal Services will help a lot of smaller organisations keep pace with technology without needing a vast IT budget. By concentrating resources in a single server machine, you can give users the full desktop experience of Win2000 irrespective of their hardware. **PCP**

RUN ANY OS

Citrix MetaFrame and other third party add-ons

You've spent £700 on Win2000 Server. Now you have to spend the same again? Not always, but it does help!

Win2000 Terminal Services starts to get a bit limited if your clients run a number of different operating systems.

If you want to take advantage of another platform, or have a mixture of client operating systems, you can still run Terminal Services, though you will need a third party add-on such as Citrix MetaFrame.

Citrix is one of the world leaders in thin client technology and its software has provided many of the enhancements in the new version of Windows Terminal Services. The whole Citrix package is geared around something called the Independent Computing Architecture (ICA), a Citrix protocol

that enables virtually any client operating system to run a Windows terminal session.

Using a product like Citrix MetaFrame 1.8 for Win2000 Servers, you can enable a much wider range of applications to be delivered to virtually any machine. MetaFrame gives you a more manageable system that actually performs faster than the standard Windows one.

Citrix refers to the system as Server-based computing, rather than network computing or terminal services. In many ways it's just another term for the same thing, but the Citrix packages do enable you to manage both fat and thin clients more efficiently and also determine distribution at an application level as

well as a client level. For example, you can have Word or Outlook delivered as a thin service and CAD as a fat service with MetaFrame.

There are a few other add-ons on the market, most of which are geared towards the same niches as Citrix, giving better management and supporting non-Windows operating systems.

Using Metaframe is as simple as the Win2000 console, but is geared towards a more manageable solution. You have to enable Win2000 Terminal Services

and Licensing first, but once that's complete, the rest of the process can be handled by Citrix.

The published application manager establishes ICA clients to have access to your applications.



SHARING DATA

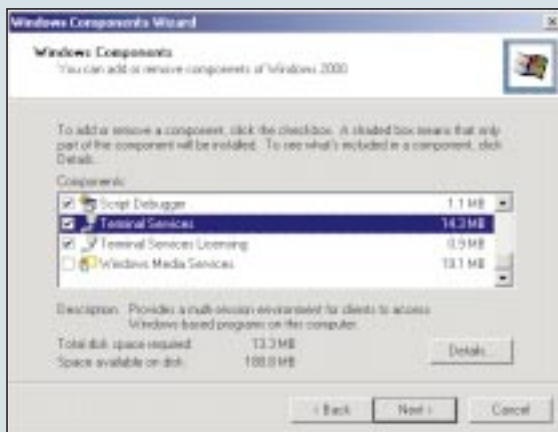
Installing Terminal Services

Installing Terminal Services isn't as easy as pressing 'go'. But here's everything you need to implement the technology

Before you start, you need to understand the technology and why you want to implement it. Then move on to specify hardware for the system, and decide whether you need add-on software like Citrix Metaframe. Then you need to enable Terminal Services, enable Terminal Services

Licensing, license the clients, create new connections, install the programs that will be shared and then create the clients! It's not all plain sailing, and must be done in the correct order to ensure that everything will work.

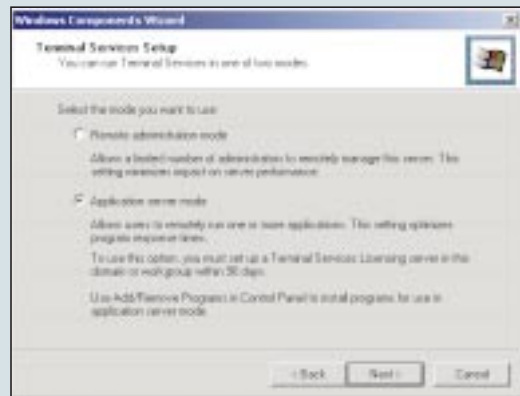
Enabling Terminal Services



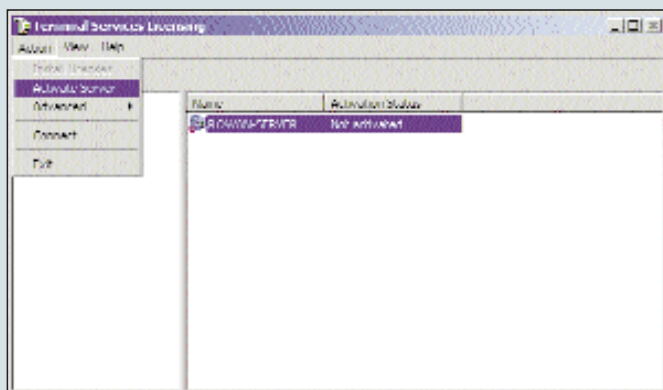
1 Terminal Services is a Win2000 component, so you can either enable it through the Add/Remove Programs application or go through the Configure Your Server wizard. Both routes take you into the Add/Remove Windows Components wizard. Scroll down to Terminal Services and click details. Ensure that the Client Creator Files and Enable Terminal Services boxes are checked and click OK. Click Next.

3 Select the default permissions for Terminal Services clients. If you will have any clients not using Win2000, it's easiest to select the NT 4.0 option, though less secure. Hit Next and reboot the system. You should have three new programs in Administrative Tools: Terminal Services Client Creator, Terminal Services Configuration and Terminal Services Manager.

2 You are then asked to select between Remote Administration and Application Server mode. We've chosen the Application Server mode to build a true 'thin client' environment.



Licensing

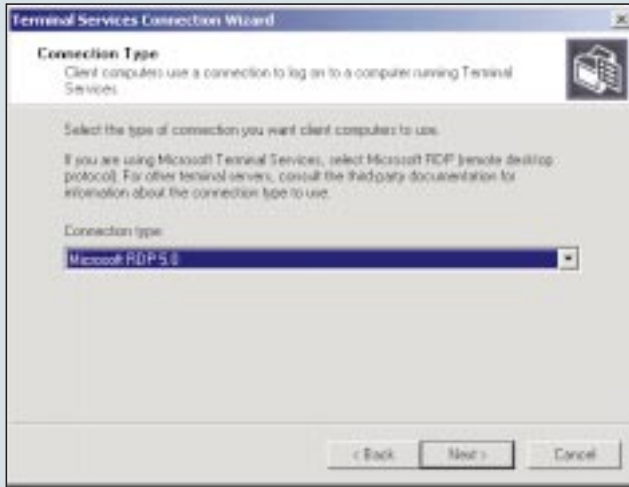


1 We found the best way to activate your license was to do it by phone, though you can also do it via the Internet, Web and fax. Whichever method you choose, give them your Product ID and they'll give you a 35 digit code to activate your server.

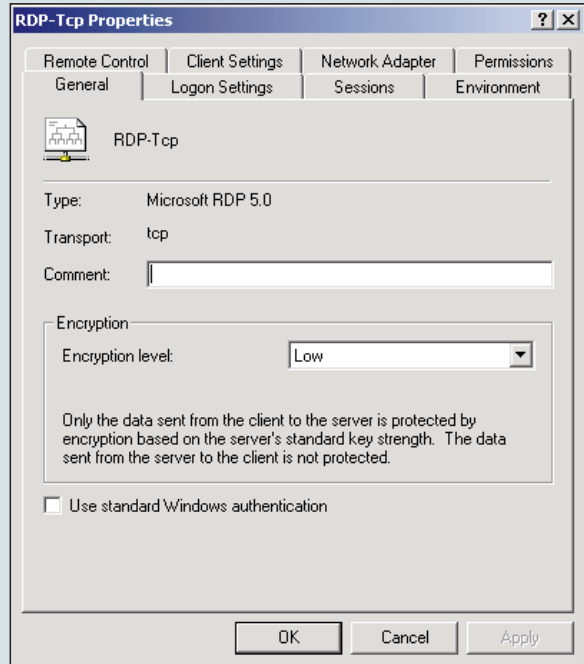


2 Add your Client Access Licenses. You buy these from Microsoft or a reseller along with the licensing package you've chosen. It's a good move to test your installation first by using the 90-day trial, then add the license packs. For this, don't select the License server option in the Win2000 Components Wizard – just install the Terminal Server.

Enabling connections

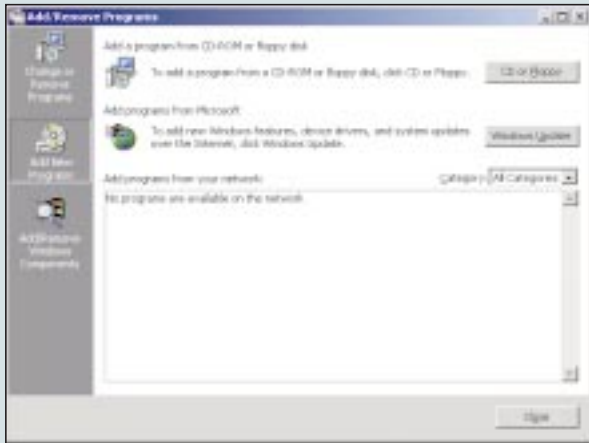


1 You need to create a connection for clients to connect to your server. You should have one automatically set up that uses Remote Desktop Protocol as its carrier, but you can create a new one for each of your clients using the wizard. Open Terminal Services Configuration and right-click on Connections, then select New Connection.



2 Now edit the properties of your connection. Use the properties box to edit the logon requirements, users and groups allowed to use the connection. For example, you may have two NICs and want two connections, one for administration and one for users.

Installing programs

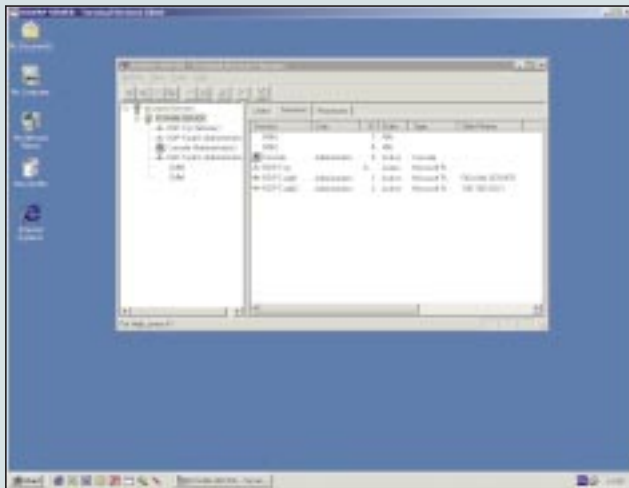


Install client applications after you've installed Terminal Services or you may find they don't work with it. Do this through the Add new Programs wizard – this ensures that registry entries will be made for Terminal Services permissions as well as local permissions.

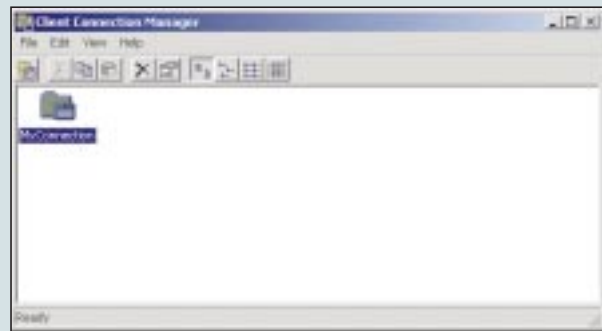
Creating clients



1 Creating clients is easy. Either do it manually through Computer Management or Active Directory for the account (though you can set a single account that all users will use) or, if the machines have floppy drives, create disks with the appropriate software on. There are two versions of the client, for 16-bit and 32-bit Windows. Make sure you choose the right one.



2 The Terminal Server Client Creator takes you through creating the disks and then the Client Software guides you through the connection.



3 You can modify the screen resolution, connection name, server name and a load of other variables from the Client Connection Manager.

NEXT MONTH

How to set up IIS 5 and configure it to integrate your business with your Intranet and Web site.