

Remote Desktop and Remote Assistance

Windows Vista and XP have two remote access features that are worth getting to know. The first is Remote Assistance. Its purpose, as its name suggests, is to let someone connect to your computer via the Internet or a LAN to work with you on a problem or project. Both of you can see the screen, and you can trade off using the mouse and keyboard to control the computer. Likewise, you can use Remote Assistance to assist someone else. However, connections can't be made arbitrarily—the “assistee” must invite the assistant via an encrypted message sent via email or Microsoft Messenger, and must indicate acceptance of the connection when the assistant response to the invitation. A Remote Assistance scenario is illustrated in Figure C.1.

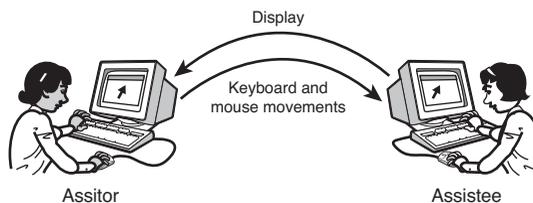


Figure C.1 With Remote Assistance, you can work collaboratively with someone else.

In contrast to Remote Assistance, the purpose of Remote Desktop is to let you remotely connect to your own computer; for example, to use your office computer from home, or your home computer from out of town. While you're connected, it's almost as if you were there, because the controlled computer's display and sound are brought to you, and the remote computer's keyboard, mouse, and even COM ports and hard disk can function as if they were connected to the home computer, as illustrated in Figure C.2.

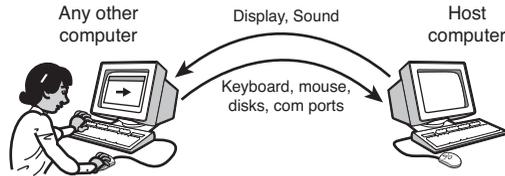


Figure C.2 With Remote Desktop, you can use your own computer from any computer running Windows or Mac OS X.

Remote Desktop works in much the same way as other remote control products such as VNC, PCAnywhere, and CarbonCopy. Personally, it seems to me to be somewhat faster than these other programs, although it has some tradeoffs:

- The capability to host Remote Desktop is available only on Windows XP Professional, Vista Business, Vista Enterprise, and Vista Ultimate, but not any of the Home versions. That is, only these more expensive versions can be the *controlled* computer.
- On the other hand, the Remote Desktop Client program, which you use to connect *to* the controlled computer, can run on Windows 9x, Me, 2000, XP, and Vista, and there is an Apple Mac OS X version as well.
- Only one person can use the controlled computer at a time. If you connect remotely, the controlled computer's own monitor switches to the Welcome Screen. And if someone then logs on locally, the remote user is disconnected.
- Remote Desktop works only over a TCP/IP network such as the Internet; it doesn't directly support modem access as PCAnywhere and CarbonCopy do. (Windows XP and Vista do provide a way for you to establish a network connection to your computer via modem, so with a few extra steps you *can* actually use a modem to connect to your computer for Remote Desktop access, but it's rather cumbersome.)
- To access your computer over the Internet you have to go through a long, complex procedure (which I'll cover shortly). Several of the third-party products listed at the end of this chapter require *no network setup at all*, which is a huge advantage. Several of them also have nifty file transfer tools, which Remote Desktop doesn't have. But they're slower than Remote Desktop.

All in all, Remote Desktop Connection is one of the spiffiest features Windows offers, and for me, it's reason enough to buy XP Pro or Vista Ultimate instead of the Home versions. It lets me use my office computer (and thus my email, documents, notes, and everything) from anywhere in the world, from nearly any Windows or Macintosh computer. Because it's quite difficult to set up, we thought it would be useful to go into the details in this chapter.

Making Your PC Available for Remote Desktop Connection

To use Remote Desktop to reach your computer from the Internet, both the computer and your Internet connection must always be up and running. In addition, you must be able to make connections from the outside world to your computer, so there are additional requirements:

- If you use dial-up Internet service, you need someone at home to establish the connection before you can connect to your computer.

- If you use cable or DSL Internet service, you must either have a static IP address assigned by your ISP, or you must use a dynamic DNS client on your computer or router to notify a dynamic DNS name service provider every time your connection's IP address changes. I tell you how to do this later in this section.
- If you use a connection-sharing router or use an Internet connection provided through Windows Internet Connection Sharing on a different computer, you must configure the sharing device or computer to forward incoming TCP connections on port 3389 to your computer. I discuss this shortly too.

If you can forgo access from the outside world, you can use Remote Desktop just within your own private network at home or work with far less setup trouble, as I note later on. The initial steps are the same.

Note

If your computer is part of a corporate network, be sure that your organization's security policies permit you to enable Remote Desktop connection. On a Windows domain network, Remote Desktop might even be disabled by the Group Policy feature.

Also, if your Internet service provider is AOL, or if you use a free advertisement-subsidized Internet service, you cannot establish Remote Desktop access to your computer.

The following sections describe the setup procedure. On XP, you must perform all these steps while logged in as a Computer Administrator.

Step 1—Enable Remote Desktop

The first step in configuring Remote Desktop Connection is to enable the connections at your computer, using this procedure:

1. Click Start, right-click [My] Computer, and select Properties.
2. On XP, select the Remote tab, and then check Allow Users to Connect Remotely to This Computer. On Vista, select Remote Settings (under Tasks), confirm the User Account Control prompt, and then select Allow Connections from Computers Running Any Version of Remote Desktop.
3. Any Computer Administrator user can connect without explicit permission. If you want to grant Remote Desktop access to any Limited Access or Power User-type accounts, you have to explicitly select them. To do this, click Select [Remote] Users, click Add, click Advanced, and then click Find Now. Hold down the Ctrl key and select any desired username(s). Click OK and then OK again. The selected names should now appear in the list of remote desktop users.

In any case, however, *only* accounts with passwords can be used. Windows does not grant access to any user account that does not have a password set.

4. Click OK to close the dialogs.

Enabling Remote Desktop *should* automatically create an exception in Windows Firewall so that connections are allowed in. The next step confirms this.

Step 2—Open Your Firewall

To check the firewall settings, click Start, Control Panel. On XP, select Security Center, and then open the Windows Firewall icon. On Vista, select Allow a Program Through Windows Firewall, and confirm the User Account Control prompt.

Select the Exceptions tab and locate the entry for Remote Desktop [Connection]. If the entry doesn't have a check mark next to it, select the entry and check the box. On XP, click Edit, and be sure that under Scope the word *Any* appears. If it doesn't, click Change Scope and select Any Computer. Click OK to close all the dialogs.

Note

If you use a third-party firewall program, you must instruct it to open access to TCP port 3389 for all IP addresses, following the instructions for your particular firewall product.

At this point you should be able to connect to your computer from any other computer on your network using Remote Desktop Connection. If you do have another networked computer, you should test this now to be sure that the first two steps have worked. Note the name of the computer you just set up. (If you don't know it, right-click [My] Computer and select Properties. On Vista, the name appears under Computer Name, Domain, and Workgroup Settings. On XP, select the Computer Name tab, and note the name after Full Computer Name. If the name ends with a period, drop the final period.) Now, go to another computer on your network, skip ahead to "Connecting to Your Computer with Remote Desktop," on p. C14, and try connecting to your computer under this name.

Note

If you want only local Remote Desktop access, you can stop at this point. This is actually useful enough—my friend Bob totes a small, slow, wireless-enabled laptop around his house, and uses it to access his primary desktop Media Center computer, mainly for email, but also to control his sound system, TV recorder, and so on.

When you know that Remote Desktop is working correctly in-house, you'll have to provide a way to access to your computer from the outside world.

Step 3—Set a Static IP Address

If your computer makes its Internet connection directly, has a fixed IP address assigned by your network manager, or gets its Internet connection through Windows Internet Connection Sharing, you can skip this step.

However, if you use a hardware connection-sharing router device, you have to configure your router and your computer so that your computer has a *static* or fixed IP address. We discussed this earlier in the chapter.

Two steps are involved: You must select a fixed address in the correct range for your network, and you must configure your router so that it does not give this address to any other computer.

Most routers automatically assign IP addresses to the computers on your network, and they typically look like 192.168.0.3 or 192.168.1.101. The first two numbers are almost always 192 and 168. The third number varies from manufacturer to manufacturer. It's usually 0 or 1, but it doesn't really matter, so in this section I'll use *x* in its place; just be sure to make note of the actual number *your* router happens to use. The fourth number is the only number that is different for each device and computer. It's usually 1 for the router itself, and a number between 2 and 254 for computers.

My recommendation is that you use addresses 192.168.*x*.200 through 192.168.*x*.254 for any computers or devices such as print servers that need a fixed address, and let your router pass out dynamic addresses from 192.168.*x*.2 up or 192.168.*x*.100 up. Most routers have a configuration screen that lets you set this; it may be on the main LAN setup page or it may be on a menu labeled DHCP. A typical setup screen is shown in Figure C.3.

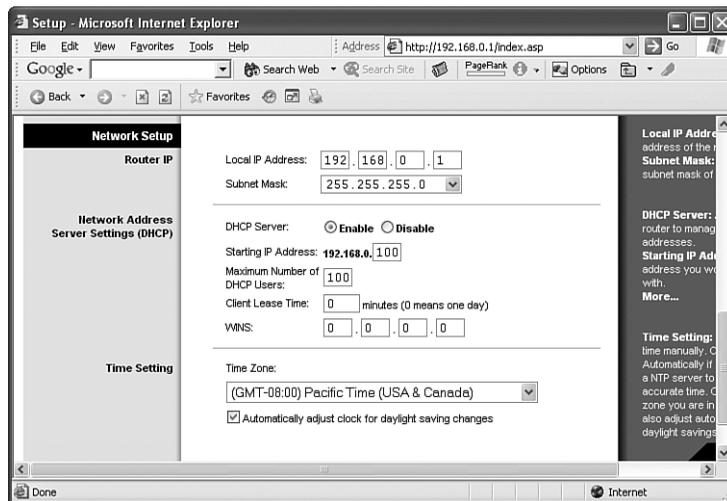


Figure C.3 Configure DHCP to pass out addresses 100 and up.

While you are doing this, also make a note of the IP address assigned to the router itself (it's 192.168.0.1 in the figure), and the Network Mask or Subnet Mask value.

For the static addresses in the range 192.168.*x*.200 to 192.168.*x*.254, you have to manually keep track of which addresses are available and which are free.

Tip

I recommend keeping a list of used and unused IP addresses on paper, in a file folder along with printed screen shots of all of your computer and network configuration screens and dialogs, to have on hand in case of an emergency—your network setup is too valuable to lose in a disk crash!

You also need to know IP address or addresses of the Domain Name Service (DNS) servers provided by your ISP. To find them, check your ISP's tech support web pages, view the setup screen

on your router to see whether you entered this information there, or go to a computer that has a functioning Internet connection, open a command Prompt window, type the command **ipconfig /all**, press Enter, and note the address or addresses listed after DNS Servers. Jot this information down for use later on.

To configure your computer, select an unused number from the list of static addresses and follow these steps:

1. Open Network Connections. To do this on XP, click Start, Control Panel, Network and Internet Connections. On Vista, click Start, Network and Internet, Network and Sharing Center, Manage Network Connections (under Tasks).
2. Locate the icon for your network adapter (it's usually labeled Local Area Connection), right-click it, and select Properties.
3. On XP, select Internet Protocol (TCP/IP). On Vista, select Internet Protocol Version 4 (TCP/IPv4). Click the Properties button.
4. On the General tab (see Figure C.4), select Use the Following IP Address.

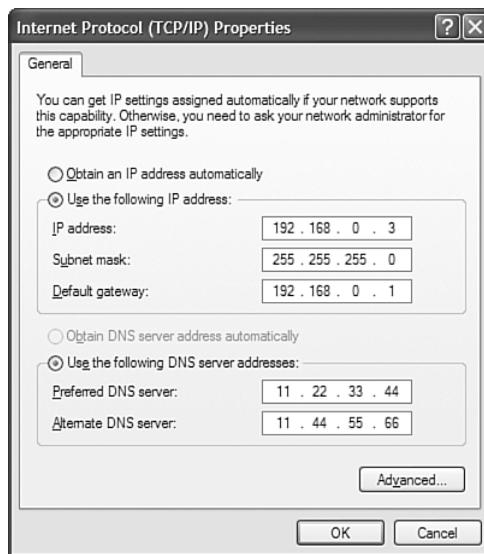


Figure C.4 Configuring a static IP address.

5. For the IP address, enter one of the available IP addresses from your list—for example, 192.168.x.2 (but with the correct digit instead of x).
6. For the subnet mask, enter the mask value you recorded from the router's setup screen. It's usually 255.255.255.0.
7. For the default gateway, enter the IP address of the router itself. It usually ends in .1.
8. For the preferred DNS server, enter the first DNS server address you noted earlier. If there was just one, leave the alternate DNS server blank; otherwise enter the second address.

9. Click OK, wait 10 seconds or so, and then test the Internet connection by trying to view a web page.

Remember to write down the IP address you used, and the name of the port computer to which you assigned it.

Step 4—Enable Port Forwarding

If you use Windows Internet Connection Sharing or a connection-sharing router, you have to instruct your sharing computer or router to forward incoming Remote Desktop connections from the router's public connection to your private network and thence to your computer. Specifically, you have to set up your sharing computer or router to forward incoming requests on TCP port 3389 to the computer that you want to reach through Remote Desktop.

If you use a connection-sharing router, it has a setup menu option titled Port Forwarding or Applications. You sometimes have to select the Advanced menu to find it. Make an entry to forward TCP port 3389 to the IP address of the host computer, which you set up in step 3. A typical configuration screen is shown in Figure C.5.

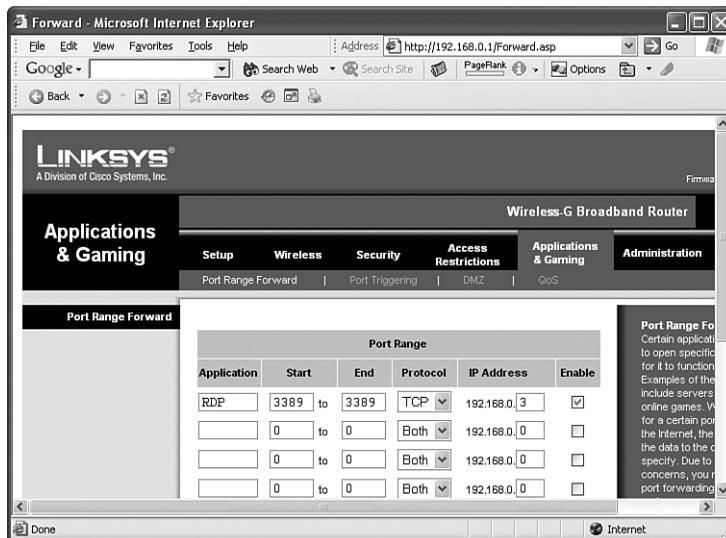


Figure C.5 Make your router forward TCP port 3389 to your computer.

If you use Windows Internet Connection Sharing, go to the computer that is sharing its Internet connection, log on as a Computer Administrator, and follow these steps:

1. Open Network Connections and locate the icon for the shared connection (it is labeled as Shared).
2. Right-click the icon and select Properties. View the Advanced tab. Under Internet Connection Sharing, click the Settings button.

3. In the Services list, locate Remote Desktop Connection and check it. The Services Settings dialog appears, as shown in Figure C.6. Enter the name of the computer to which you will be connecting with Remote Desktop, or if it has a static (fixed) IP address, enter the IP address.

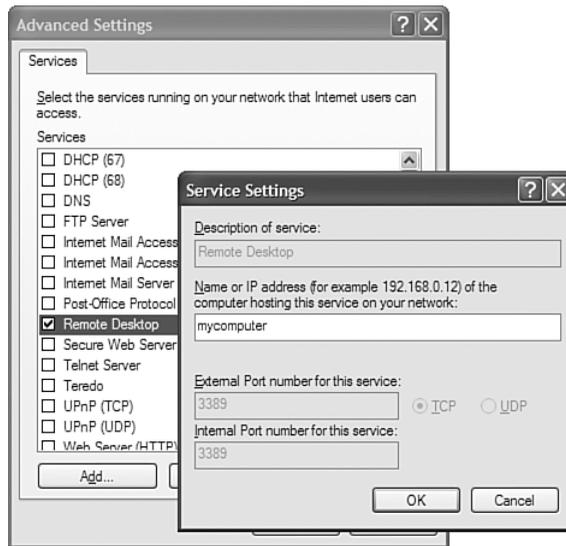


Figure C.6 Enter the name or static IP address of the computer to be reached via Remote Desktop.

4. Click OK to close the dialogs.

The next step is to ensure that your computer will be reachable when it's needed.

Step 5—Establish a Permanent Connection

Many consumer-grade broadband Internet services provide temporary connections, requiring a username and password to establish a connection that lasts until a certain amount of time has passed with no data traffic, or until you force a disconnection. Dial-up Internet service is always connection-based, and DSL service often is as well, using a scheme called Point-to-Point Protocol over Ethernet, or PPPoE. Cable Internet service is usually “always on,” but some cable providers also use PPPoE. This scheme helps conserve the limited number of IP addresses allotted to your Internet service provider, but it's no good if you have to be sitting in front of your computer to establish a connection when you want to connect to it remotely! So, if you have a connection-based Internet service, you'll need to configure your computer or sharing router to keep the connection alive all the time.

If you are using a broadband connection-sharing router device, its setup screen should have an option to keep the connection on permanently. The means varies from one manufacturer to another, but it's usually there. Enable any settings that mention establishing a connection

automatically, sending Keep Alive packets, and if there is a setting for disconnecting after a certain amount of time idle, set it to zero or Never. A typical setup screen is shown in Figure C.7.

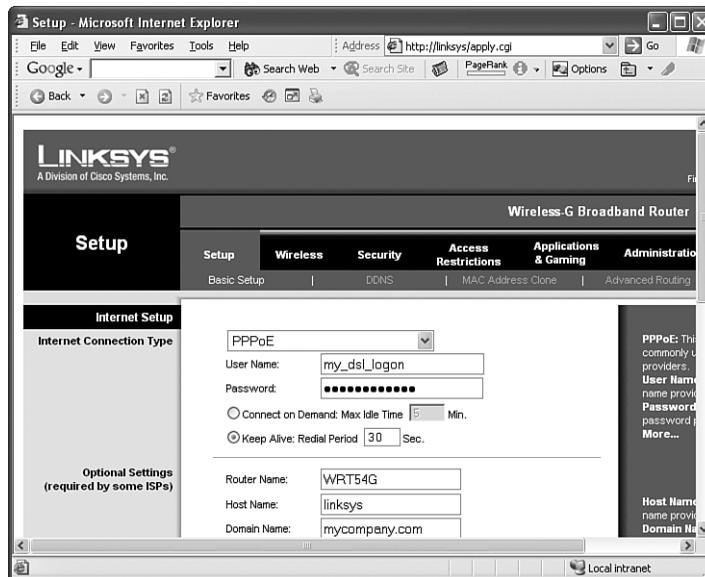


Figure C.7 Use your router's setup screen to establish an always-on connection.

If you establish your Internet connection directly from Windows using an icon on the Network Connections window, either at a solo computer, or on a computer that shares its connection with Internet Connection Sharing, follow these steps:

1. Open Network Connections, and locate the icon for your Internet connection; this is the one that you set up with the username and password required by your ISP.
2. Right-click the icon and select Properties.
3. View the Options tab and make the following changes: Set Redial Attempts to 20, Time Between Redial Attempts to 10 seconds, Idle Time Before Hanging Up to Never, and check Redial If Line Is Dropped.
4. Click OK, and establish the connection.

If your computer shares this connection with Internet Connection Sharing, the connection should stay up as long as your computer is powered on. If the connection is not shared, it stays up as long as your computer is turned on and your account stays logged on. It's not ideal, but it'll work for a while. (You might consider getting a connection-sharing router device just so that you can let *it* do the job of keeping your connection up; it shouldn't cost more than \$20, and does a much better job than the Internet Connection Sharing software.)

Caution

This type of always-on connection can even be set up with a standard analog dial-up or ISDN connection, but before you try it with analog dial-up or ISDN, be sure that you aren't going to be charged on a per-minute basis, or you could be in for a very nasty surprise when the next phone bill arrives.

Additionally, if you want your computer to be remotely accessible at all times, you should anticipate that a power failure might occur while you're away. You may want to configure your PC's BIOS to automatically turn the computer on after a power outage. Dell computers label this setting "AC Power Recovery." Other manufacturers use different terms.

Step 6—Obtain a Domain Name Service Name

Lastly, to reach your computer from the Internet, you'll need to know the IP address of the Internet connection used by the computer you're contacting. If you have business-class Internet service, your computer may have a public, static (fixed) IP address and you may have domain name service set up so that you can use a name like *maggie.mycompany.com* to reach your own computer. If so, you're finished, and can go ahead and try to connect to your computer using Remote Desktop. Some ISPs also provide static IP addresses for single-computer customers, for a monthly fee.

However, the majority of us use consumer-grade dial-up or broadband Internet service, where the IP address can change every time a connection is made, or at least every few days or weeks. In this case, you present a moving target to the Internet, and to connect to your computer from outside you need a way to find out what its IP address is.

What you need is called Dynamic Domain Name Service (DDNS). There are several free DDNS services, but to keep this short I'll describe how to use only one, *dyndns.com*. *Dyndns.com* maintains DNS servers whose job it is to turn hostnames such as *joebob.homedns.org* into IP addresses. You simply register and set up an account, choose a hostname, and configure your computer or router to automatically notify *dyndns.com* when your network's external IP address changes. That's the dynamic part—the address gets updated without any manual intervention. When this has been set up, the selected hostname is recognized anywhere on the Internet and returns your router's current external IP address.

There are two steps to setting up DDNS service: creating an account at *dyndns.com* and configuring your network to send updates when its IP address changes. I'll describe the basic, free service here.

To set up service at *dyndns.com*, follow these steps:

1. Visit www.dyndns.com and click Create Account. Make up and enter a username, enter your email address, enter a password, enter any optional information you feel like entering, review and check acceptance of the Terms of Service, check I Will Create Only One Free Account, and click Create Account. Be sure to write down your logon name and password to keep in your network setup file.

2. Check your email for a message from dyndns.com, and double-click the URL it contains to confirm your account.
3. Click Login, and enter your username and password. Click Login.
4. Under My Services, click My Hosts, Add New Hostname.
5. Make up and enter a hostname, and select a domain name from the drop-down list, as illustrated in Figure C.8. The combination of the two is the name you'll use when you connect to your computer with Remote Desktop, so choose something easy to remember; it might be something like joebob.homedns.org.

Figure C.8 Select the hostname and domain name you'd like to use to access your computer.

6. For Service Type, select Host with IP Address. Under IP Address, click Use Auto Detected IP Address. Leave the Wildcard and Mail Routing boxes unchecked. Click Create Host to create the entry. If no one else has used the same combined hostname and domain name, it should work; otherwise you might be asked to select a different name or domain.

When your selected name has been accepted, be sure to write down the combined hostname and domain name to keep in your network setup notes.

You can return to the My Hosts list later and edit this information. To change the host or domain name, however, you must delete the host and add a new one.

Now the host and domain name combination you selected is online and available anywhere on the Internet. You must now install some software to ensure that your hostname entry is updated when your IP address changes.

Tip

Some hardware Internet connection-sharing routers (gateways) have DDNS updating software built in. I have found that the updating software built into home routers is generally not as reliable as it should be, so even if you do have a connection-sharing router, I recommend that you don't use its DDNS feature. Instead, install a software updating service, as I describe next.

The final setup step is to install a DDNS update client, a program that runs on one of your computers and updates dyndns.com whenever your IP address changes (and in any case, at least once every few days so that your hostname is not dropped). [Dyndns.com](http://dyndns.com) has a free downloadable DDNS update client called the DynDNS Updater that runs as a Windows service, and is always active whether anyone is logged in or not. Install it on the computer that you set up for Remote Desktop access (because it is the one that is left turned on), following these steps:

1. From the www.dyndns.com homepage, select Support, and then click Download Now to get the DynDNS Updater. Save the file on your desktop.
2. Right-click the downloaded file. On XP, select Run As, select Administrator, enter the Administrator password, and click OK. On Vista, select Run as Administrator and confirm the User Account Control prompt.
3. Click Next to proceed through each installation step. At the Choose Components step, be sure that Install as a Service and Start with Windows are both checked. At the last step, click Finish, and the DynDNS Updater starts.
4. When the DynDNS Updater Configuration program prompts you, enter the DynDNS.com username and password that you selected earlier. Click Okay.
5. The host and domain name you selected earlier should appear under My Hosts. Check this entry and click OK.

The configuration window should now disappear, and a crescent moon-shaped icon should appear in the Notification area of your taskbar. The Updater now continuously monitors your external IP address and notifies dyndns.com if and when it changes. It sends an update every few days in any case, to keep the hostname alive.

At this point, your Remote Desktop setup is complete. You should now be able to connect to your computer from another computer at another location via the Internet. The instructions for doing so appear after the next section.

Note

Although dyndns.com updates its database instantly when the DDNS updating program or router notifies it of a change, ISPs can elect to hang on to (cache) address information for an arbitrary amount of time—minutes to hours. If your home network's connection goes down and comes back up with a new IP address, you might have trouble re-establishing a Remote Desktop connection to it until the ISP you're using at the remote site allows the cached address to expire and finally queries dyndns.com for the current one. This might take up to an hour.

Providing Access to More than One Computer

After you have one computer configured, tested, and reachable by Remote Desktop from the Internet, you can consider making other computers on your network available as well. If your computers all have their own public IP addresses, you can just repeat the previous steps. But if you have a shared Internet connection, there are some additional considerations.

By default, Remote Desktop uses TCP port 3389 for its connection. This works fine *within* a given network because each computer has its own IP address and network name. However, when you use a shared Internet connection, only one IP address is visible to the outside world, so another means must be used to designate to which of your computers you want to connect. What you need to do is designate different ports to be used to reach each of the additional computers. I use port numbers 3390, 3391, and so on for my additional computers.

The setup screens for some hardware connection-sharing routers let you designate different external *and* internal port numbers for port forwarding. If yours permits this, setting up additional computers is a snap. Simply direct incoming connections on different ports to your various computers, as in this sample router forwarding configuration:

External Port	Internal Port	Protocol	Internal IP Address
3389	3389	TCP	192.168.0.3
3390	3389	TCP	192.168.0.5
3391	3389	TCP	192.168.0.6

With this setup, from the outside world a Remote Desktop connection to, say, `remote.mycompany.com`, which uses the default port, would go to the computer with the IP address 192.168.0.3. A connection to `remote.mycompany.com:3391` would be forwarded to the computer with IP address 192.168.0.6. The router takes care of translating not only the IP address of the connection, but also the port, so that the target computer receives the connection on the standard port 3389.

Within your private network you can still use Remote Desktop to connect to these computers, using their assigned computer names and no specified port number.

If your router does not permit you to specify different external and internal port numbers, your additional computers must be configured so that Remote Desktop listens on alternate ports. The router's Port Forwarding setup might look something like this:

Port	Protocol	IP Address
3389	TCP	192.168.0.3
3390	TCP	192.168.0.5
3391	TCP	192.168.0.6

In this example, you would have the computer at IP address 192.168.0.3 use the default Remote Desktop port, and would configure the computers with addresses 192.168.0.5 and 6 to use alternate ports 3390 and 3391.

To do this, make a list of computers that are to be reachable by Remote Desktop. Select a port number for each computer that you want to reach, starting with 3389 and going up or down from there. Unless you're using Microsoft Internet Connection Sharing, each of these computers must also be configured to use a fixed IP address, which you should also write down along with the chosen port number.

Now perform the following steps on each of the computers that will use a nonstandard port:

1. Log on as a Computer Administrator, enable Remote Desktop, and designate authorized users as described earlier.
2. Open the Registry Editor by clicking Start, Run, regedit, and pressing Enter.
3. In the left pane, view the key HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\TerminalServer\WinStations\RDP-Tcp.
4. In the right pane, double-click the value PortNumber. Select Decimal, and change the port number from 3389 to the chosen value for this particular computer. Then click OK and close the Registry editor.
5. Open the Control Panel. On XP, select Security Center, Windows Firewall, and select the Exceptions tab. On Vista, select Allow a Program Through Windows Firewall. Click Add Port. For the name, enter **Remote Desktop (Alternate Port)**. For the port, enter the number you used in step 4. Select TCP. Click Change Scope and verify that All Computers is checked. Click OK three times to close everything.
6. Restart the computer.

Now, if you're using Windows Internet Connection Sharing, configure the sharing computer to forward incoming connections on the additional ports to the selected computers. You can specify the computers by name.

Otherwise, configure your router to forward the additional ports to the selected computers. Specify the computers by their IP addresses, which must be configured as fixed addresses.

If you want to use Remote Desktop Connection to control any of the additional computers from *within* your private network, you have to specify the correct port number as well as the computer name.

Connecting to Your Computer with Remote Desktop

To establish a connection to a computer that's been set up to receive Remote Desktop connections, you need a copy of the Remote Desktop Client, also called the Terminal Services Client. There are several ways you can get this program:

- It's preinstalled on Windows XP and Vista computers. Select Start, All Programs, Accessories, Communications (on XP only), Remote Desktop Connection.
- It's on any Windows XP CD-ROM. Insert it in another Windows computer, and from the setup program select Perform Additional Tasks, and then Set Up Remote Desktop Connection. This runs the installation program.

- You can download it from www.microsoft.com. Search for Remote Desktop Client.
- On Apple Macintosh computers running Mac OS X, download the Mac version from www.microsoft.com/mac. Search for Remote Desktop Connection, and click on “Connect Across Platforms with Remote Desktop Connection | Mactopia.”
- For UNIX and Linux, there are open-source versions under development that run under X11. See, for example, www.rdesktop.org. (Don’t expect too much.)
- If you are using a Windows computer and the Remote Desktop Program isn’t listed on the menu (at an Internet café for example), click Start, Run (on XP only), type `mstsc` and press Enter. If the Run command is not available, see whether you can open a Command Prompt window. On a really well locked-down system, even that might not be available. So try this: If Microsoft Word is available, start Word, and then click Tools, Macros, Visual Basic Editor. In the left pane, right-click This Document and select Insert, Module. In the Editor pane, type this macro:

```
sub term()  
    shell "mstsc"  
end sub
```

Put the cursor on the word Shell and press the F5 key. (You can use this same trick to get to a command prompt, by replacing "mstsc" with "cmd".)
- Try to download and install the Remote Desktop Connection program from Microsoft.com.
- As a last resort, use an ActiveX version of the client that runs within Internet Explorer. Search microsoft.com for the Remote Desktop Connection Web Connection Software Download. Download and run the software and install it in a temporary folder. Open Internet Explorer and click File, Open, Browse, and then locate the file `default.htm` in the folder into which you installed the software. If Internet Explorer warns you about running Active content, permit it to do so. You should then be able enter the DNS name of the remote computer and click Connect.

When you run the Remote Desktop Client, you’ll see the Remote Desktop Connection dialog, as shown in Figure C.9.

Enter the IP address or registered DNS name of the computer you’d like to use. If you want to connect to a computer using an alternative TCP port number, enter a colon and the port number after the IP address or name, as in **remote.mycompany.com:3391**.

Entering a username and password at this point is optional. If you don’t enter them now, you are asked for them when the connection is established. Click Connect to establish the connection immediately, or click Options to adjust the connection properties first. I describe the Remote Desktop Connection version that comes with Vista and XP Service Pack 3; if you have an older version, it may have fewer options. The properties tabs are described in Table C.1.



Figure C.9 The Remote Desktop Connection dialog lets you configure the connection and select the remote computer to use.

Table C.1 Remote Desktop Connection Properties

Tab	Properties
General	Connection Settings saves the configuration for a particular remote computer as a shortcut for quick access later.
Display	Sets the size and color depth of the window used for your remote connection's desktop. Display size can be set to a fixed window size, or Full Screen. You can adjust the screen size to your own preference. I prefer to use the Full Screen setting, with Display the Connection Bar when in Full Screen Mode checked.
Local Resources	Connects devices on the local (client) computer so that you can use them as if they were part of the remote (host) computer. (This feature does not work when connecting to Windows NT and Windows 2000 Terminal Services.) The Keyboard setting determines whether special Windows key commands such as Alt+Tab apply to your local computer or the remote computer. Click the More button to let the remote computer access devices on the local computer. You can use local smart cards, serial ports, disk drives, and some Plug-and-Play (USB) devices.
Programs	Lets you automatically run a program on the remote computer upon logging on.
Experience	Lets you indicate your connection speed so that Windows can appropriately limit display-intensive features such as menu animation.
Advanced	Sets features used on corporate networks. If you mostly connect to your own computer, rather than to a corporate terminal server, set the Server Authentication option to Connect and Don't Warn Me.

When you establish the connection, you'll see a standard Windows logon dialog. Enter your user-name and password to sign on. It may take a while for the logon process to complete if Windows has to switch out a logged-on user.

When you're logged on, you'll see the remote computer's desktop, and you can use it as if you were actually sitting in front of it. Keyboard, mouse, display, and sound should be fully functional. If you maximize the window, the remote desktop fills your screen. It all works quite well—it can even be difficult to remember which computer you're actually using!

In addition, any printers attached to your local computer appear as choices if you print from applications on the remote computer, and if you enabled them before you established the connection, the local computer's drives appear in the list in [My] Computer, as shown in Figure C.10. You can take advantage of this to copy files between the local and remote computers, although it's rather slow.

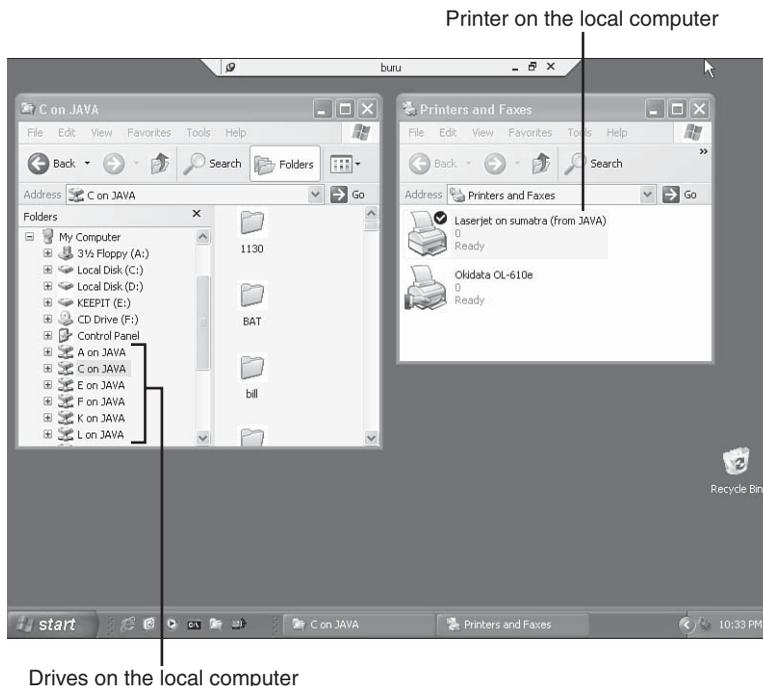


Figure C.10 When connected via Remote Desktop, your local computer's drives and printers can be made available.

If you selected the Full Screen option, your view of the remote computer's screen takes up the entire display. If you want to do something on the local computer, move the mouse to the top of the screen, and when the title bar rolls down, click the Minimize button.

Tip

If the computer to which you connect has multiple monitors, you may find that an application seems to be running, but you can't make its window appear. What's happened is that it's positioned offscreen, a place where it would be on the second monitor that doesn't exist in the Remote Desktop world. To move it into view, right-click the application's button in the taskbar. If Minimize is grayed out, click Restore, and then right-click again. If Maximize is grayed out, click Restore, and then right-click again. Select Move, and use the left or right arrow key to bring the window into view.

Tip

If the computer that you are using to *make* the connection has multiple monitors, you can make the Remote Desktop view span across them, as long as they meet the following requirements: The monitors must be side by side, they must be set to the same resolution, and the combined resolution must be 4096 by 2048, or less. To make the connection, click Start, All Programs, Accessories, Command Prompt. Type **mstsc /span** and press Enter. Click the Options button, select the Display tab, and be sure that the Remote Desktop Size is set to Full Screen. Then select the General tab and make the connection. The remote computer treats your combined monitors as one large monitor. (It can be somewhat more annoying than you might expect because things such as the Welcome screen and the taskbar span both monitors.)

While you're connected, you might want to use keyboard shortcuts such as Alt+Tab to switch between applications on the remote computer. By default, this doesn't work because they are interpreted by the local computer and Alt+Tab simply switches you away from the Remote Desktop application. However, you can specify which computer should be the one to interpret special key combinations on the Local Resources properties page, as I described earlier, or you can use alternate key combinations to ensure that the desired actions take place on the remote computer. The alternate keyboard shortcuts are shown in Table C.2. It's worth memorizing these key combinations.

Table C.2 Some of the Remote Desktop Keyboard Shortcuts

Use These Keys:	To Transmit This to the Remote Computer:
Alt+PgUp, Alt+PgDn	Alt+Tab (switch programs)
Alt+End	Ctrl+Alt+Del (task monitor)
Alt+Home	(Display the Start menu)
Ctrl+Alt+Break	Alt+Enter (toggle full screen)
Ctrl+Alt+Plus	Alt+PrntScrn (screen to clipboard)

When you've finished using the remote computer, choose Start, Log Off to sign off and end the connection. If you want the remote computer to continue running an application, though, you can simply close the Remote Desktop window or select Disconnect. Your account stays active on the remote computer until you reconnect and log off. I use this feature extensively: My spam filter is very slow, so I find it better to leave my account logged in all the time, and leave the email program open all the time. When I leave work I use Windows+L to switch off but stay logged on. Then, from home I can reconnect with Remote Desktop to check email.

Note

Windows Vista and XP Professional permit only one person to use each computer. If you attempt to connect to a computer while another user is logged on, you have to choose between disconnecting or forcing the other user off. If Fast User Switch is enabled, the user is simply switched out. Otherwise he or she is summarily logged off. This is somewhat brutal because the other user might lose work in progress.

If you log on using the same username as the local user, though, you simply take over the existing desktop without forcing a logoff, with any applications that were running still active.

If someone logs on to the remote computer while you're connected from afar, you are disconnected. Again, if Fast User Switch is enabled, you can reconnect later and pick up where you left off. Otherwise, the same deal applies: If the other user used a different username, your applications are shut down.

Finally, you may notice that the TEMP environment variable is not what you expect when you log on with Remote Desktop. When a second or subsequent session is created with the Welcome screen, or if you create a new logon session through Remote Desktop—as opposed to connecting to one initially started at the computer itself—the Terminal Services system creates a subfolder under your usual temporary folder named 1 or 2 or another digit, and TEMP points to this subfolder. If you disconnect without logging out and later reconnect to the session at the computer console itself, TEMP still refers to this subfolder.

Third-Party Remote Connection Tools

If you don't want to go through the hassle of setting up access to your computer via Remote Desktop, or if you have one of the Windows XP or Vista Home versions that don't support incoming Remote Desktop connections, several other options are available to you. I'll give them a brief mention here.

- **TeamViewer**—Available free for personal, noncommercial use, TeamViewer requires no network setup, and can even make your LAN available to the remote client computer through a built-in Virtual Private Networking (VPN) service. Both Windows and Mac clients and hosts are available. Check out www.teamviewer.com.
- **LogMeIn**—Available in free and Pro versions—Pro gets you file transfer, sound, and printing. Mac and Windows versions available. No network setup necessary. Information at www.logmein.com.
- **I'm InTouch**—Another no-network-setup remote access product. The remote client is Java-based so you could access your PC from your Blackberry. How cool is that? Check out www.01com.com.
- **BeAnywhere**—This is another subscription-based remote access product, requiring no network setup. Check it out at www.beanywhere.com.
- **LapLink Everywhere** (formerly Carbon Copy)—LapLink requires no network setup. Clients are available for Palms and PocketPCs as well as PCs. Information at www.laplink.com.
- **GoToMyPC**—This is a commercial subscription-based product that offers remote access through any web browser. Information at www.gotomypc.com.
- **RAdmin**—RAdmin is a low-cost, XP- and Vista-compatible remote control program. Information at www.radmin.com. Requires network setup.
- **Symantec PCAnywhere**—This is one of the original remote control programs. You can connect via modem, LAN, or Internet. It suffers from feature bloat, some longstanding bugs, and Symantec's general disinterest in supporting individual customers, but overall, it's a solid, industrial-strength product. Its file transfer feature is very useful. Available from www.symantec.com and most software resellers. Requires network setup.

- **VNC**—VNC is an open-source program initially developed by AT&T. A big plus for VNC is that both host and client programs are available for virtually every operating system. There are quite a few VNC versions available, with TightVNC and RealVNC the most popular. At the time this was written, TightVNC and the free version of RealVNC do not work on Windows Vista as a host. For information, check www.tightvnc.com and www.realvnc.com. Requires network setup.

So there you have it—a plethora of alternatives to Remote Desktop, most of which don't require any network setup, several of which are free, and almost all of which work on all versions of XP and Vista.

The products that don't require network setup work by establishing an outbound connection from your host computer to the manufacturer's servers. When you connect remotely, you connect to these same servers, which shuttle the data back and forth on your behalf. This technique avoids the need for setting up a DNS hostname or dealing with Dynamic DNS and firewall issues; however, most of the vendors have to charge for this service. (TeamViewer and LogMeIn do provide free service, with restrictions.) Remember, when you set any of them up, to elect to start the host service with Windows so that the service is available any time your computer is turned on, even if you haven't logged on.

The last three listed products accept Internet connections directly, so to use them you have to go through the same job of setting up Internet access, an Internet host and domain name, static IP addressing, and port forwarding as described in the section "Making Your PC Available for Remote Desktop Connection" earlier in this chapter. You just need to forward different TCP port numbers from your router to your computer, and you need to be sure that the port has an exception in Windows Firewall. Table C.3 lists the port numbers that have to be forwarded and opened, by product.

Table C.3 Port Numbers Used by Remote Control Products

Product	Port
PCAnywhere	TCP 5631
VNC	TCP 5800 and 5900
RAdmin	TCP 4899