

Administrator's
Guide

Remote Network
Accelerator[™]

The logo for Remote Network Accelerator features the text "Remote Network Accelerator" in a sans-serif font. The word "Accelerator" is in a larger, bold font and includes a trademark symbol. To the right of the text is a stylized graphic consisting of two overlapping, curved lines that form a partial circle, suggesting motion or acceleration.

LapLink[®] Remote Network Accelerator[™]
High Performance Tools for Remote Networking

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Patents

SpeedSync® U.S. Patent Number 5,446,888

LapLink® Remote Network Accelerator

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LapLink® Remote Network Accelerators Administrator's Guide

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1 Introducing Remote Network Accelerator

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What is LapLink Remote Network Accelerator (RNA)?

LapLink RNA is client/server software that speeds up remote access to an office network without altering the way users work. Whether users connect over virtual private network (VPN) connections or remote access servers (RAS), use a wired or wireless (802.11 or GPRS) network, LapLink RNA enhances performance by reducing the amount of information transmitted over the connection. LapLink RNA is compatible with a variety of VPN solutions as well as remote access software and hardware.

Accelerates remote access

More and more business people need to work away from their offices— whether from home or such remote locations as branch offices and hotels.

Many businesses are responding to these needs by offering their employees VPN access over the Internet so that they can connect to the office network and work much as they would over a direct network connection in the office.

Unfortunately VPN access connections typically are so slow that they reduce productivity and may incur unnecessary costs.

As a remote access accelerator, LapLink RNA uses sophisticated technologies to minimize the data transmitted between the network and the remote computer. The result is faster and more efficient remote access.

LapLink RNA supports TCP/IP and IPX protocols.

LapLink RNA works independently of the medium of communication.

It enhances performance over VPN connections as well as analog and ISDN connections. It can improve even direct network connections, though less dramatically.

Works in the background

LapLink RNA improves remote access without changing or adding new interface. Users don't have to change the way they are used to working. Except for improved performance, they aren't even aware that LapLink RNA is running.

A client/server software solution

LapLink RNA consists of two services:

- LapLink RNA Server
- LapLink RNA (the client service)

LapLink RNA Server can be installed on a Windows NT 4.0/Windows 2000 Server or Workstation, or Windows XP. The computer can be a dedicated network server, or a workstation.

The client can be installed on a computer running Windows 98 or Windows NT 4.0/Windows 2000 Workstation or Windows XP. Using the LapLink RNA CD, you can distribute client installations via a

What is LapLink Remote Network Accelerator (RNA)?

network. You can also customize installations by editing a Setup script file named Script.txt.

LapLink RNA is entirely a software solution; there's no need to buy new equipment. And it works with a variety of third-party remote access products, including software (Windows 2000 RAS, for example) and hardware (such as Cisco 3000).

How does LapLink RNA work?

LapLink RNA speeds up network access by caching network files on the client computer, compressing data and transmitting it more efficiently, and sending only changes during file updates.

LapLink RNA speeds up network access to your office network through a combination of technologies:

- Local caching of network files
- Incremental updates using SpeedSync
- Better compression of data and more efficient transfer

As a result of these technologies, less data is transmitted, data is transmitted more efficiently, and network access is faster.

How caching works

On a client computer, LapLink RNA maintains a cache of recently accessed network files. This cache is maintained from session to session and updated when necessary.

While working on a file, the user works from the cached copy. When the user saves the file, both copies—cache and network—are updated.

When the user opens the file again, LapLink RNA compares the network copy with the cached copy and opens the cached copy whenever they are identical. When the files are not identical, the cache is updated and then opened.

How SpeedSync works

When files are updated, SpeedSync shortens transfer times by sending only the parts of the files that have changed since the last update.

SpeedSync works with a user's local cache to reduce the amount of data transferred over the connection. When a user saves a network file, for example, only the most recent changes are sent back to the network, not the entire file. A similar thing happens when a user reopens a network file that has been changed since the last time the user accessed it; only the changes are transmitted.

How transmissions are shortened

Compression speeds the transmission of data by “shrinking” files before they are sent and restoring them to their original sizes on arrival. For even greater efficiency, it also groups and compresses requests for data from the other computer.

Before installing LapLink RNA

Before you begin setting up LapLink RNA, make sure that your network and the server and client computers meet the hardware and software requirements necessary to run the program.

Install the LapLink RNA client service on each computer that connects to your office network by remote access. Install LapLink RNA Server on a network server or a networked workstation that you can control and make available for acceleration at all times.

General system requirements

The office network must meet these requirements:

- A Microsoft or Novell NetWare network
- A computer running Microsoft Windows NT 4.0/Windows 2000 Server or Workstation, or Windows XP on which LapLink RNA Server is installed
- A VPN connection over the Internet or a remote access server (such as those available from Microsoft and Cisco).

Requirements for LapLink RNA Servers

The computer on which you install and run LapLink RNA Server must meet these requirements:

- Microsoft Windows NT 4.0/Windows 2000 Server or Workstation, or Windows XP
- Intel or Intel-compatible processor that meets the requirements of your Windows operating system
- 16 MB RAM plus the RAM that meets the requirements of your Windows operating system
- 5 MB disk space free for the program files

!TIP Our testing shows that Windows 2000 Server provides the best performance, and Windows NT Workstation provides the worst.

Requirements for LapLink RNA clients

A computer on which LapLink RNA client is installed must meet these requirements:

- Microsoft Windows 98, Windows NT 4.0/Windows 2000 Workstation, or Windows XP
- Intel or Intel-compatible processor that meets the requirements of your Windows operating system
- 8 MB RAM plus the RAM that meets the requirements of your Windows operating system
- 5 MB disk space free for the program files and at least 5 MB disk space free for the cache

2 Configuring Remote Network Accelerator Server

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Overview of acceleration settings

Customize network acceleration by changing the acceleration settings. Manage acceleration, view statistics, change logging settings, and set the account password in the LapLink RNA Server Properties dialog box. Access the properties by double-clicking the LapLink RNA Server service in the LapLink RNA Service Manager.

LapLink RNA settings determine how to provide network acceleration for remote computers. They let you control incoming connections and specify how to log acceleration activity.

Accessing the LapLink RNA Server Properties dialog box

View and change LapLink RNA settings in the LapLink RNA Server Properties dialog box. This dialog box runs independently of the LapLink RNA Service Manager. You can keep it open even after you close the LapLink RNA Service Manager, and you can work in the LapLink RNA Service Manager without closing the dialog box.

To access the LapLink RNA Server Properties dialog box:

- 1 Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.
- 2 Do one of the following:
 - Double-click LapLink RNA Server.
 - Click LapLink RNA Server and click the Properties button.
 - Click LapLink RNA Server and click Properties on the Service menu.
 - Right-click LapLink RNA Server and click Properties on the shortcut menu.

To close the LapLink RNA Server Properties dialog box without applying changes, click the Cancel button.

Accessing different types of properties

The LapLink RNA Server Properties dialog box is made up of four tabs: General, Statistics, Logging, and Advanced. Each tab contains different information about the LapLink RNA Server service.

The buttons at the bottom of the dialog box affect the entire dialog box, not just the current tab. For example, if you click the Apply button when the Logging tab is active, you apply any changes you made on the Advanced tab as well.

To access different types of properties:

- Click the tabs at the top of the LapLink RNA Server Properties dialog box.

For information about logging, see the *LapLink RNA Installation and Quick Start Guide*.

Providing acceleration

LapLink RNA automatically makes the server available for incoming connections. However, you can also manually stop and restart LapLink RNA Server for testing or special circumstances. Stop acceleration service and disconnect all users by clicking the Disable button in the LapLink RNA Server Properties dialog box. Restart acceleration service by clicking the Enable button.

Once you install LapLink RNA Server, the server computer is available to provide acceleration service. It can accept incoming connections and act as a proxy between remote computers and the network.

LapLink RNA automatically starts and enables LapLink RNA Server when Windows starts. There is no need to enable the service yourself. As long as LapLink RNA Server remains enabled, it is available for incoming connections.

Stopping network acceleration

For testing purposes and in special circumstances, you can disable LapLink RNA Server. When you disable the service you disconnect all connected users. For information about disconnecting users, see page 20.

To stop network acceleration:

- 1 Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.
- 2 Highlight the LapLink RNA Server.
- 3 Click the Disable button.

Restarting network acceleration

Enable LapLink RNA Server to restart network acceleration when your testing is complete. Enabling does not reconnect previously connected users to the server computer. However, it does make the computer available for incoming connections again.

To restart network acceleration:

- Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.
- Double-click LapLink RNA Server.
- Click the Enable button.

Disabling removes much of LapLink RNA Server from memory. You can clear most of LapLink RNA from memory by clicking Suspend All Services on the Service Menu.

You can also enable and disable LapLink RNA Server from the LapLink RNA Service Manager. Click the Enable or Disable button on the toolbar.

Changing the LapLink RNA Server user account

LapLink RNA Server creates a user account in Windows NT, Windows 2000 or Windows XP. This account allows LapLink RNA Server to service incoming connections. If the account is changed or removed in the Windows Computer Management (or User Manager in Windows NT), it must be changed or replaced from the LapLink RNA Server Properties dialog box. On the Advanced tab, click the Set Password button to type the password for the account.

LapLink RNA Server relies on a Windows NT, Windows 2000 or Windows XP user account to service incoming connections. LapLink RNA creates the account, and you assign its password, during installation. This account is for LapLink RNA's use only; do not use it for any other purpose.

If LapLink RNA Server's user account password changes, or if the account is deleted, LapLink RNA Server cannot provide remote network acceleration. This message appears in the LapLink RNA Service Manager description: *No acceleration. Reset the password on the Advanced tab in Properties.* In this situation, you need to reset the account before your computer can provide acceleration service.

Access the Set Password dialog box from the Advanced tab in the LapLink RNA Server Properties dialog box. The information you type in the Set Password dialog box overwrites all of the information specified in the Windows Computer Management (User Manager). If the account has been deleted, LapLink RNA creates it again. LapLink RNA does not compare the current password to the new password you type; it overwrites the password set in Computer Management.

Do not use the user account that LapLink RNA Server creates for any other purpose.

You can also change the name of LapLink RNA Server's user account. This is helpful for administrators who use naming conventions for user accounts. Change the user account name from the Set Password dialog box only. The name you type overwrites the current name in the Windows Computer Management (User Manager). The default user account name for LapLink RNA Server is *TSI_name*, where *name* is the name of your computer.

!TIP If you type the name of an existing user account, LapLink RNA overwrites the existing account.

Access to the Set Password dialog box is restricted according to user rights in Windows NT, Windows 2000 or Windows XP. You must have administrator rights on the computer to change LapLink RNA Server's user account information.

To change the LapLink RNA Server user account:

- 1 Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.
- 2 Highlight the LapLink RNA Server.
- 3 Click the Advanced tab and click the Set Password button.

Changing the LapLink RNA Server user account

- 4 Type a new password in the Password box, and confirm it by typing it again in the Confirm box.
- 5 Click OK.

3 Managing Users

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Overview of managing users

Control and monitor user connections and activity from the LapLink RNA Server Properties dialog box. Access the properties by double-clicking the LapLink RNA Server service in the LapLink RNA Service Manager. Manage connections on the General tab. View connection and acceleration statistics on the Statistics tab.

Once you install LapLink RNA Server, users can connect to your server computer for acceleration. LapLink RNA Server accepts incoming connections and acts as a proxy between remote computers and the network.

Managing users involves monitoring users to determine acceleration benefits and user load. LapLink RNA Server provides user information and statistics to help you manage users.

Accessing user information

When users connect to your server computer, LapLink RNA Server provides visual feedback and information about the connections. This information appears in the LapLink RNA Service Manager and in the LapLink RNA Server Properties dialog box. Check the LapLink RNA Service Manager for a quick look at how many users are currently connected. For more detailed information, check connection information and statistics in the service's properties.

To access user information in the LapLink RNA Service Manager:

- Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.

To access user information in the service properties:

- 1 Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.
- 2 Highlight the LapLink RNA Server.

Managing connections

The General tab in the LapLink RNA Server Properties dialog box provides information about connected users. From there you can view individual user information. You can also disconnect users from the acceleration server.

Monitor and disconnect users from the General tab in the LapLink RNA Server Properties dialog box. Each user is monitored individually.

Understanding individual user information

LapLink RNA Server shows this information for each connected user:

User Name shows the network logon name for the connected user.

Computer Name shows the Windows computer name for the connected user.

Time Connected shows how long the user has been connected to the server in days, hours, minutes, and seconds.

Idle Time shows how long the user has been connected to the server but not transferring files across the connection. The idle time is shown in days, hours, minutes, and seconds.

If you are concerned about user load, check the idle time of connected users. Users with a high idle time are likely to be the least disturbed if you disconnect them.

How many users can connect to the server at once?

The number of users that can connect to a single server depends on the capabilities of the server computer. For the best performance, the LapLink RNA Server computer should have approximately 400K of memory available for each incoming connection. To see how much memory you should have on the server computer for the fastest acceleration, add the total amount of memory for all connections to the amount your computer normally requires to run Windows NT, Windows 2000 or Windows XP (see Microsoft System Requirements for exact specifications).

For example, suppose your computer normally uses 30 MB to run Windows NT. For the fastest acceleration with four incoming connections you should have 32 MB of RAM.

For the best performance, it is recommended that you not rely on swap space (disk space allocated to reduce memory load) as memory for servicing connections. However, there is still noticeable acceleration when the LapLink RNA Server uses swap space.


Disconnecting users

Disconnect users who have been idle for an extended period of time, or who should not be connected to the server.

!TIP LapLink RNA Server disconnects users immediately; it stops any transfers that are in progress. Users lose access to any open files.

Disconnecting users does not disconnect them from the network; but it does disconnect them from the proxy. Users must reopen any files they were working with. Most acceleration benefit is lost.

To disconnect all users from the server and keep users from connecting, click the Disable button.



To disconnect a user:

- 1 Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.
- 2 Highlight the LapLink RNA Server.
- 3 Click the user you want to disconnect and click the Disconnect button.

Understanding statistics

LapLink RNA Server tracks statistics that show user connection, load, and acceleration information. View statistics by clicking the Statistics tab in the LapLink RNA Server Properties dialog box. The information shown is for all connections during the current session. To set all statistics to zero and start recording them again, click the Reset Statistics button.

LapLink RNA Server records in the log when the number of connections reaches 10, 20, 30, and so on.

All statistics (except those that specify “current”) show cumulative values since you last clicked the Reset Statistics button.

Understanding statistics

LapLink RNA Server records connection and transfer information so that you can monitor server activity and load. It shows these statistics on the Statistics tab in the LapLink RNA Server Properties dialog box:

Current Connections shows the number of users currently connected to LapLink RNA Server.

Maximum Number of Connections shows the maximum number of users that have been connected to LapLink RNA Server at once since statistics were last reset.

Average Number of Connections shows the average number of users that have been connected to LapLink RNA Server since statistics were last reset. This average is calculated based on time periods when at least one user is connected.

Current Load shows the total current CPU load for LapLink RNA Server. If this number is high, then this computer might not have enough free CPU cycles to perform other tasks; you might want to upgrade your hardware or add additional LapLink RNA servers.

Average Load shows the average CPU load for LapLink RNA Server since statistics were last reset. This average is calculated based on time periods when at least one user is connected.

Peak Load shows the maximum CPU load for LapLink RNA Server since statistics were last reset.

Total Bytes Sent and Received shows the total data that connected users requested to send to and receive from the network since statistics were last reset.


Accelerated shows how much of the data sent and received by LapLink RNA Server was transferred in a compressed form.

Unaccelerated shows how much actual data was sent and received by LapLink RNA Server during this session. Unaccelerated data is data that was not cached by clients and could not be compressed.

Resetting statistics

Normally LapLink RNA begins recording statistics when LapLink RNA Server is enabled. However, you can reset statistics to start a new session. LapLink RNA sets all statistics to zero and begins recording them again.

Reset statistics to monitor individual transfers, or for testing.



To reset statistics:

- 1 Open the LapLink RNA Service Manager by double-clicking its icon on the Windows taskbar.
- 2 Highlight the LapLink RNA Server.
- 3 Click the Statistics tab and then click the Reset Statistics button.

Administering client settings

LapLink RNA's client configuration includes some options that system administrators may want to set on the client computer. Use Encrypt Cache Data to secure the information in the LapLink RNA cache. Click Use Write-behind Caching to speed up network access, or clear it to protect data in case of system failure. You also may want to determine an optimal cache size limit, and set logging options for the client.

For the fastest remote network access, use write-behind caching but not encryption.

As the system administrator, you can set (or recommend settings for) the LapLink RNA client service's advanced caching options. These include Encrypt Cache Data and Use Write-behind Caching. Set both options on the client computer, in the LapLink RNA Properties dialog box.

For the greatest acceleration benefit, do not change the advanced caching settings. The defaults are recommended for the best performance.

The Use Encrypt Cache Data option is off by default.

Encrypting the cache

Encrypt the data in the LapLink RNA cache to secure any important or restricted network files that LapLink RNA caches on the client computer's local hard disk. Without cache encryption, it is possible that someone with access to the client computer could read the cached information through the cache database.

Data encryption has only a minor effect on network acceleration. More time is required to encrypt and unencrypt the data in the cache as you store and access it.

The Write-behind Caching option is on by default.

Using write-behind caching

Write-behind caching uses the LapLink RNA cache to speed up write operations as well as read operations. Using write-behind caching, LapLink RNA places network file changes in the cache instead of constantly sending them to the network. LapLink RNA accumulates the changes in the cache until either the program requests them or the file is closed.

Write-behind caching improves response time because the application does not have to wait while changes are written to the network drive. The speed increase depends on many factors, including the programs running on the client computer, the type of file, hardware and software configurations, and how busy the system is.

!TIP Turning off write-behind caching can dramatically slow remote network performance.

Using write-behind caching only slightly increases the risk of data loss. Because changes are sent to the network less frequently, if the client is disconnected from the network while file handles are open, information could be lost. However, there is always a greater risk of data loss over remote connections.

LapLink RNA monitors the cache on disks as large as 4 GB. If the disk where the cache is stored is greater than 4 GB, LapLink RNA only recognizes 4 GB of the disk space.

Recommending cache size

Suggest that client users allow a large amount of disk space for the cache. A greater allowed space means that LapLink RNA can cache more data, which can greatly improve performance.

There is no maximum recommended cache size. Because LapLink RNA caches files in a database, it always accesses cached data quickly, regardless of the cache size.

Recommending logging options

The client computer's log is a good source to help you troubleshoot problems with the client service. Therefore you should be sure that users keep a log of acceleration activity. The client logging options in Windows NT, Windows 2000 or Windows XP are the same as those for LapLink RNA Server. For information about the LapLink RNA logging options in Windows NT, Windows 2000 or Windows XP see the *LapLink RNA Installation and Quick Start Guide*.

4 Troubleshooting

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Introduction to troubleshooting

This chapter provides suggestions for solving problems and improving performance. These suggestions are designed as a quick overview of possible solutions, with enough information to guide experienced users to solutions.

For detailed, step-by-step information, consult the troubleshooters in LapLink RNA Help. The troubleshooters are designed to solve problems you can encounter configuring, monitoring, and connecting LapLink RNA services.

To use a troubleshooter, open a troubleshooting book in Help Topics and display one of the topics. Then answer the questions about your problem and try the suggested remedies. In some cases you will find shortcut buttons to dialog boxes; use these buttons to resolve the problem faster.

Troubleshooting LapLink RNA Server

General concerns

Description text reads: *Communications error <number> occurred. Go to Troubleshooting in Help.*

This description appears when an RPC error occurs. Make a note of the error number in case you need to contact your support representative.

Try stopping and restarting the service (LapLink RNA LapLink RNA Server) in Windows NT, Windows 2000 or Windows XP using the Services option in Control Panel. If the error remains, try restarting Windows. If this still does not solve the problem, uninstall LapLink RNA and then reinstall.

Problems with incoming connections

Acceleration isn't as fast as expected for all connected users.

It's possible that the computer running LapLink RNA Server does not have enough memory to service all connected users.

The LapLink RNA server computer should have approximately 400K of virtual memory available for each incoming connection. This is in addition to the system requirements for the operating system on the computer.

For best performance, it is recommended that you not rely on swap space (disk space allocated to reduce memory load) as memory for servicing connections.

Windows OS	OS RAM requirements	Total RAM requirements for 4 LapLink VPN connections
Windows NT 4.0	30 - 40 MB	32 MB
Windows 2000 Server	256 MB	258 MB
Windows 2000 Workstation	64 MB	66 MB
Windows XP	128 MB	130 MB

I disconnected all connected users, but some of them reconnected before I could finish what I needed.

To disconnect all users and keep them from reconnecting, disable the service. Disabling immediately disconnects each user (following the same steps as disconnecting individual users), and disallows any incoming connections.

Users can't connect.

A server computer can only have 150 LapLink RNA Server and E-mail Accelerator Server connections at a time.

Problems with the user account

Status description text reads: *No acceleration. Reset the password on the Advanced tab in Properties.*

This description appears if LapLink RNA Server's account password has been changed in the Windows Computer Management (User Manager), or if the account has been deleted. LapLink RNA needs complete access and control over this account to service incoming connections.

From the LapLink RNA Service Manager, double-click LapLink RNA Server and click the Advanced tab. Click the Set Password button. Type a new password for the account and retype it to confirm. Click OK.

For more information about the user account, see chapter 2, "Configuring LapLink RNA Server."

Why can I type a wrong password for the user account in the Set Password dialog box?

LapLink RNA overwrites the existing password in the Windows Computer Management (User Manager). There is no need for you to remember the old password, or to make the same change in the Windows Computer Management (User Manager).

Troubleshooting LapLink RNA clients

General concerns

Client description text reads: *Client only: using cache for acceleration.*

This description appears when the client computer is running LapLink RNA but is not connected to a LapLink RNA server.

Check the network connection. If there is no connection or a fast connection on the network, then Client only is the preferred state. For fast connections, the client can benefit from LapLink RNA's caching, but there is no need to accelerate through a proxy.

If this message appears when the client computer has a slow remote connection, then the client is not receiving full acceleration benefits. Click the Servers button to make sure there is a designated server. Make sure LapLink RNA Server is enabled on the designated server computer.

Client description text reads: *Not accelerating. The cache disk is full.*

This message appears when the client computer's disk is full. LapLink RNA can't provide acceleration because it can't successfully cache network files. Free some space on the disk where LapLink RNA stores the cache (the cache location is specified on the Cache tab in the LapLink RNA Properties dialog box).

To clear the error and resume acceleration, disable the service and then enable it again.

Client description text reads: *Communications error <number> occurred. Go to Troubleshooting in Help.*

This description appears when an RPC error occurs. Make a note of the error number in case you need to contact your support representative.

If you are running Windows NT, Windows 2000 or Windows XP, try stopping and restarting the service (LapLink RNA) using the Services option in Control Panel.

If the error remains, or if you are running Windows 98, try restarting Windows. If this still does not solve the problem, uninstall LapLink RNA and then reinstall.

Problems connecting to a server

I don't get prompted to connect to a LapLink RNA server.

LapLink RNA connects to the designated server automatically. Check the status of LapLink RNA to check the connection. If the description reads *Connected to <server name>*, then LapLink RNA has connected to the acceleration server automatically.

If the description reads *Client only: using cache for acceleration*, then see the "General concerns" section on page 25 for troubleshooting help.

When I try to designate a server, the server computer isn't in my preferred server list.

You can add a server to the preferred server list. Click the Add button and browse your network neighborhood or type the server's name or IP address.

When I try to add the server computer I want, it doesn't show up in the list of available servers.

Make sure the LapLink RNA server computer is running, and LapLink RNA Server is enabled and free of errors. Under Microsoft Windows Network, be sure you are looking in the right domain or workgroup. If you can't find it in that branch, check the NetWare or Compatible Network branch. If you still can't find the server by browsing, type the server's IP name or address.

Certain configurations, such as Windows NT, Windows 2000 or Windows XP clients with TCP/IP only, never see servers listed. In this situation, type the server's name or IP address to add it to the list.

LapLink RNA can't locate the server computer.

LapLink RNA only connects to a LapLink RNA Server when required to for acceleration. So if you have connected to the network but have not yet listed or opened network files, LapLink RNA won't yet be connected to a server. Also, LapLink RNA only connects to a server if your connection is slow enough to require use of a LapLink RNA server for acceleration.

If you are connected to the network over a slow connection and accessing files, but still aren't connected to a server, make sure you have access to the network itself—can you access any files on the network? If you can't, then the problem is with the network, not with the LapLink RNA server.

Try manually connecting to the server; disable the service, click Designate Servers on the LapLink RNA Service Manager's Service menu, and click OK. Then enable the service again. If this doesn't

work, contact your system administrator to find out whether the LapLink RNA server computer is enabled and running properly.

Client performance concerns

I'm not sure my remote network access is accelerated.

Check the Statistics tab in the LapLink RNA LapLink RNA Properties dialog box to monitor acceleration performance. If there is a number in the Total Bytes Sent and Received status information, it means data is being sent and received, and the LapLink RNA is working correctly.

If the Accelerated statistic reports a high percentage, this means LapLink RNA has compressed files before sending data across the connection, or has found data in the cache file. If the Unaccelerated statistic reports a high percentage, this means that the data requested is already in as compressed a state as possible, and most or all of the file had to be sent over the connection as is.

For more information about the LapLink RNA statistics tab, click on the Help button in the dialog box.

The statistics indicate that some of my transferred data isn't accelerated. Is that okay?

Yes. Sometimes data is already compressed as much as possible, and hasn't been cached yet. Most or all of the file had to be sent over the connection as is.

How can I be sure I'm getting the most benefit from LapLink RNA?

LapLink RNA determines the best methods for accelerating transfers. There are a few settings that can increase benefit:

- Make the allowed cache size as large as possible: on the Cache tab in the properties dialog box, drag the Max Cache Size slider to the right.
- Do not encrypt cache data unless security is a major concern. Encryption can slow performance. On the Advanced tab in the properties dialog box, click Encrypt Cache Data so that it is cleared.
- Use write-behind caching. This allows LapLink RNA to speed up data writes as well as reads. On the Advanced tab in the properties dialog box, click Use Write-behind Caching so that it is checked.

Cache concerns

The cache is full. What should I do?

When the cache is full, it automatically removes the least-recently accessed data and adds any new cached information, so you rarely need to worry about the cache size. However, if you have disk space available, you might be able to improve acceleration performance by increasing the cache size. This might be necessary if you frequently access very large files.

No matter how big I make my cache, it keeps filling up.

It's okay for the cache to fill up. When it becomes full, it automatically removes the least-recently accessed data, making room to cache new information. A large cache size means that many files that you access frequently are accelerated.

The cache isn't taking up as much space as I specified.

The cache only takes up as much space as it needs. The value you specify is the space LapLink RNA is *allowed* to use for the cache.

I think a file I'm accessing is coming from the network instead of the cache.

If you access many different, large files, your cache might not be big enough to store all of them. When the cache gets full, it removes files you haven't accessed in a while to make room for new ones. So if you haven't worked with a file for some time, and you've accessed other large network files since then, it's possible that the "older" file is no longer cached. To avoid this, allow as much space as possible for the cache.

Another reason a file might not come from the cache is if the file name or network location changed since it was stored in the cache. When LapLink RNA checks to see if a network file you want to access is stored in your cache, it uses the current file name and location.

Server events

LapLink RNA Server can log the following messages in the Windows NT, Windows 2000 or Windows XP Event Viewer. The event messages appear here in alphabetical order. Each message contains a brief description of when or why it occurs and, if applicable, how to resolve the problem. For information about logging LapLink RNA Server events, see the *LapLink RNA Installation and Quick Start Guide*.

Connection failed because of low memory.

LapLink RNA Server could not accept an incoming connection because there was not enough memory available on the computer. Try to free some memory by closing other programs running on the computer. If this is not possible, install additional memory on the computer, or install another LapLink RNA server on the network and have some users connect to it instead.

For information about memory and LapLink RNA server, see page 23.

Error determining the Windows type and version.

LapLink RNA was unable to determine what version of Microsoft Windows is running on the computer. This may arise if a serious error occurs in another Windows application. Try restarting Windows. If the error remains, reinstall LapLink RNA.

Error enabling the connection manager services.

LapLink RNA can't start the services that let LapLink RNA Server communicate with clients and the network. Try restarting Windows. If the error remains, reinstall LapLink RNA.

Error enabling the multi-user API services.

LapLink RNA can't start the services that let LapLink RNA Server handle network access for connected users. Try restarting Windows. If the error remains, reinstall LapLink RNA.

Error enabling the Named Services interface.

LapLink RNA could not start the service that allows client users to browse and find LapLink RNA servers on the network. Try restarting Windows. If the error remains, reinstall LapLink RNA.

Error enabling network communications.

LapLink RNA can't communicate with the network to accelerate clients' remote network access. Make sure the computer is connected to the network and can access network files. Try restarting Windows. If the error remains, you might need to reinstall network drivers or LapLink RNA.

The number of connected users reached 10 (20, 30, and so on).

LapLink RNA Server is currently accelerating network access for 10 or more remote users (or 20 or more, or 30 or more, and so on).

Started LapLink RNA Server service.

LapLink RNA Server has started successfully. This normally occurs when you start Windows or enable the service manually.

Stopped LapLink RNA Server service.

LapLink RNA Server has stopped successfully. This normally occurs when you end a Windows session or disable the service manually.

This computer is running low on memory.

The LapLink RNA server computer has little memory available to handle incoming connections. Try to free some memory by closing other programs running on the computer. If this is not possible, install additional memory on the computer, or install another LapLink RNA server on the network and have some users connect to it instead.

For information about memory and LapLink RNA server, see page 23.

User *<name>* connected to LapLink RNA Server.

The specified user connected to this server for acceleration. This normally occurs when the client service senses a slow connection and automatically connects to the LapLink RNA server. It also appears if the client connects manually.

User *<name>* disconnected from LapLink RNA Server.

The specified user disconnected from the server. This normally occurs when the client terminates the slow connection to the network. It also appears when the client disconnects manually.

Client events

LapLink RNA can log the following messages in the Event Viewer (in Windows NT, Windows 2000 or Windows XP) or the current day's log file (in Windows 98). The event messages appear in alphabetical order. Each message contains a brief description of when or why it occurs and, if applicable, how to resolve the problem. For information about logging LapLink RNA events, see the *LapLink RNA Installation and Quick Start Guide*.

A cache error has occurred.

An unknown type of cache error has occurred. LapLink RNA can't read or write to the cache, and there may be no acceleration.

Cache file *<file name>* is corrupt. Creating a new cache.

The LapLink RNA cache was somehow damaged. This can sometimes occur if you turn off the computer without first shutting down the operating system. A new cache is created, and all information must be accessed from the network.

Can't create cache control files.

LapLink RNA can't create the files it uses to communicate with and control the cache. Try restarting Windows. If the error remains, reinstall LapLink RNA.

Can't create LapLink RNA cache directory.

LapLink RNA can't create the directory in which to store the cache. No acceleration can occur, because LapLink RNA can't cache network files. Make sure the drive or folder is not read-only or restricted in some other way. If the drive is a removable disk, make sure it's properly inserted in the computer.

Connected to LapLink RNA server *<server name>*.

LapLink RNA has successfully connected to the specified LapLink RNA server. This normally occurs when LapLink RNA senses a slow connection and automatically connects to a LapLink RNA server.

Could not install file system filter driver.

LapLink RNA could not install the driver that allows it to read and access network files. This can occur if another program causes a serious error on the computer. Restart Windows and reinstall LapLink RNA.

Disconnected from LapLink RNA server <*server name*>.

LapLink RNA has disconnected from the specified server. This normally occurs when you terminate the slow connection to the network.

Error writing to network file <*file name*>. File may be lost or damaged.

While saving or moving the specified file, an error occurred. This usually means your connection to the network is lost. If possible, save or back up the file locally. When you restore the network connection, carefully check the network file. If necessary, replace it with your local backup, or with a temporary file your application may have created as a safety precaution.

A fatal error has occurred – disabling the Cache.

A fatal error has occurred on your computer. Try restarting Windows. If the error occurs again, reinstall LapLink RNA.

Error communicating with file system filter driver.

LapLink RNA could not use the driver that allows it to read and access network files. This can occur if another program causes a serious error on the computer. Restart Windows. If the error remains, reinstall LapLink RNA.

Error initializing file system filter driver.

The driver that LapLink RNA uses to read and access network files did not initialize properly. This can occur if another program causes a serious error on the computer. Restart Windows. If the error remains, reinstall LapLink RNA.

Error initializing LapLink RNA RPC interface.

The LapLink RNA service could not communicate with the user interface (the properties dialog box or the LapLink RNA Service Manager). This can occur if another program causes a serious error on the computer. Restart Windows. If the error remains, reinstall LapLink RNA.

Error loading module <*module name*>.

One or more of the dynamic link libraries LapLink RNA uses to accelerate remote network access is unavailable. This can occur if another program causes a serious error on the computer. Try restarting Windows. If the error remains, reinstall LapLink RNA.

Error starting file system filter driver.

The driver that LapLink RNA uses to read and access network files did not start properly. This can occur if another program causes a serious error on the computer. Restart Windows. If the error remains, reinstall LapLink RNA.

Error stopping file system filter driver.

The driver that LapLink RNA uses to read and access network files did not stop properly. This can occur if another program causes a serious error on the computer. Restart Windows. If the error remains, reinstall LapLink RNA.

LapLink RNA cache is working.

LapLink RNA is using the cache to accelerate remote network access as normal.

LapLink RNA cannot run while other network caching software *<product name>* is installed.

There is another software program on the computer that caches network files. LapLink RNA can't accelerate network access when another program is already caching the network information. To receive benefits from LapLink RNA, uninstall the other program.

LapLink RNA client/server version mismatch.

The LapLink RNA server that LapLink RNA tried to connect to is a different version than the client software. For optimal performance, the latest version of LapLink RNA should be installed on both the client and server computers.

LapLink RNA server connection failed.

LapLink RNA tried to connect to the designated LapLink RNA server but did not succeed. Make sure that there is still a connection to the network. Can you access the file server?

Make sure that the LapLink RNA server computer is running and the service is enabled and free of errors. Try connecting to the server manually: disable the service, and from the LapLink RNA Service Manager on the client computer, click Designate Servers on the Service menu. Click the service and click OK. Then enable the service again.

LapLink RNA Server not available.

LapLink RNA tried to connect to the designated LapLink RNA server but did not succeed. The server is not available to receive incoming connections.

Make sure that there is still a connection to the network. Can you access the file server?

Make sure that the server computer is running and the service is enabled and free of errors.

Try connecting to the server manually: disable the service, and from the LapLink RNA Service Manager on the client computer, click Designate Servers on the Service menu. Click the service and click OK. Then enable the service again.

Started LapLink RNA service.

LapLink RNA has started successfully. This normally occurs when you start Windows or enable the service manually.

Started LapLink RNA driver.

The driver that LapLink RNA uses to accelerate remote network access started successfully. This message appears in Windows NT, Windows 2000 or Windows XP only.

Stopped LapLink RNA service.

LapLink RNA has stopped successfully. This normally occurs when you end a Windows session or disable the service.

Stopped LapLink RNA driver.

The driver that LapLink RNA uses to accelerate remote network access stopped running. This message is for information only; it is not an error. It appears in Windows NT, Windows 2000 or Windows XP only.

An unexpected disk error has occurred <detail>.

An error has occurred on the disk LapLink RNA is running on. The message provides detail about what LapLink RNA was unable to do with the disk (read or write, for example). If the drive is a removable disk, make sure it is properly inserted in the computer. Check to see if the disk is full or damaged.