
# Remote Network Accelerator

## Evaluation Guide

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LapLink Software

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# LapLink Remote Network Accelerator Evaluation Guide

**Introduction:**

This evaluation guide will provide you with an overview of LapLink Remote Network Accelerator. We'll outline the features, and how they work. When you've completed the tutorial, you'll know for yourself the benefits.

# What is LapLink Remote Network Accelerator (RNA)?

LapLink RNA accelerates access to your office network from remote locations without changing the way you work. Running in the background on your home (or other remote) computer, LapLink RNA client software communicates with LapLink RNA Server on your office computer to improve performance by reducing the amount of data transferred over the connection. You can benefit from LapLink RNA whether you connect to the office network using a remote access server (RAS) and a modem or a virtual private network (VPN) connection through the Internet.

## LapLink RNA accelerates remote access

Like an increasing number of business people, you can no longer do without the network when you leave your office. Whether from home, a hotel, or some other remote location, you connect to your office network as a matter of routine. Unfortunately these remote access connections typically are so slow that they reduce productivity and often incur unnecessary costs.

As a remote access accelerator, LapLink RNA uses sophisticated technologies to minimize the amount of data transferred and transfer it more efficiently. The result is that you can access your network resources faster and more efficiently.

LapLink RNA works regardless of how you connect to your office network. Connections are improved whether you connect over a modem to a RAS, use DSL to connect to a VPN on the Internet, or use a GSM/GPRS wireless modem. LapLink RNA works with both wired and wireless (802.11) networks.

## LapLink RNA works in the background

When you connect to your office network you work much as you do when connected directly to the network in the office. Adding LapLink RNA accelerates your work, but nothing else changes:

you don't have to learn new routines or change the way you work. Except for the improved performance, you aren't even aware that RNA is running.

### LapLink RNA is a client/server software solution

LapLink RNA consists of two services:

- Remote Network Accelerator (the client service)
- Remote Network Accelerator Server

The client runs on the computer you use to connect to the office, for example, your home computer or your laptop. The server runs on a computer on your office network. This could be your desktop, or a network server. The client and server work together to accelerate your connection. LapLink RNA is entirely a software solution; there's no need to buy new equipment.

## How does LapLink RNA work?

LapLink RNA speeds up remote access to your office network by compressing data and transmitting it more efficiently. In addition, it stores copies of network files locally on your computer, and accesses this cache instead of the network whenever possible. When you update a file, LapLink RNA sends only the parts that have changed since the last update.
LapLink RNA speeds up remote access to your office network through a combination of technologies:

- Local storage of network files (caching)
- Incremental updates using SpeedSync™
- Compression of data and more efficient transfer
- Predictive Look-ahead when retrieving data from the office computer…when you request a portion of a file from the server, extra data is retrieved and entered into the local cache

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

### How caching works

When you access a network file from a remote location, LapLink RNA places a copy of the file in a cache on your local hard disk. While working on the file, you work from the cached copy. When you save the file, you update both copies. When you open 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

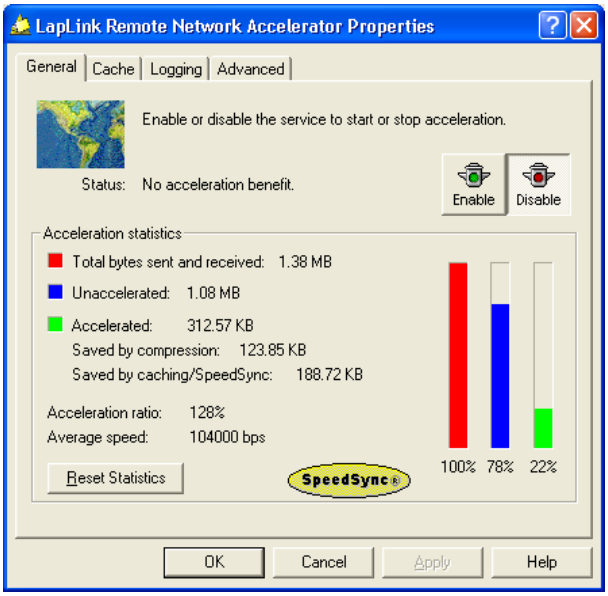
When you are updating files, SpeedSync shortens transfer times by sending only the parts of the files that have changed since the last update. SpeedSync works with your local RNA cache to reduce the amount of data transferred. When you save a network file, for example, only the most recent changes are sent back to the network, not the entire file. The same thing happens when you reopen a network file that has been changed since the last time you accessed it from your remote location.

## 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.

## Monitoring and customizing LapLink RNA

When you install LapLink RNA client on your home computer, you also install the RNA Service Manager. By double-clicking the RNA Service Manager icon in the Windows taskbar, you can monitor RNA and view a log tracking acceleration activity. In the RNA Service Manager you can also change the size and location of the cache, empty the cache, stop and restart acceleration, and perform such advanced operations as securing the cache through encryption. If you are a network administrator, the RNA Service Manager running on your network server provides usage and load-balancing statistics.



# Installing LapLink RNA

## General system requirements

The office network must meet these requirements:

- A Microsoft or Novell IP network. LapLink RNA supports networks that use the TCP/IP protocol.
- LapLink RNA Server installed on a computer (connected to the network) running
    - Windows 2000 Workstation or Server
    - Windows XP Professional
    - Windows NT 4.0 Server or Workstation

  **!TIP** This computer may be a network server, or a workstation connected to the network
- Either a VPN server or a RAS server to allow remote computers to connect to the office network. See your network administrator for information about this.

## Requirements for LapLink RNA clients

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

- Runs Microsoft Windows 98 or Windows ME, Windows NT 4.0 or 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.
- A way of connecting to the office network. For example,
    - a modem that uses Dial-up Networking to connect to a RAS server.
    - a DSL connection that uses a VPN server to connect over the Internet.
    - a wireless GSM/GPRS modem that uses a VPN server to connect over the Internet.

## Installing LapLink RNA Server and Client

Installing LapLink RNA is as simple as following the prompts on your screen. LapLink RNA Server is installed on your office workstation or a network server, and LapLink RNA Client is installed on your computer at home or perhaps your laptop.

Install the LapLink RNA Server on your network server or on a computer connected to the network. This computer does not have to be dedicated, but you must have administrator's rights to it and it should be available at all times.

**To install LapLink RNA Server:**

1. On the Welcome screen, click Remote Network Accelerator, and then click Server.
2. Follow the instructions on your screen.
3. Restart Windows to enable the LapLink RNA Server.

**To install LapLink RNA client:**

1. On the Welcome screen, click Remote Network Accelerator, and then click Client.
2. Follow the instructions on your screen.
3. Restart Windows to enable the LapLink RNA client.

# Getting Connected

## Connect to your office network as you usually do

When you're connecting directly over a phone line to the network, this usually involves three steps:

1. Dialing up the network using Microsoft Dial-Up Networking
2. Logging on to the remote access server (RAS) on the network
3. Logging on to your network

When you're connecting over the Internet to the network, this usually involves three steps:

1. Connecting to the Internet through your Internet Service Provider (ISP)
2. Logging on to the VPN server on the network
3. Logging on to your network

Depending on how these connections are set up, you may not see each specific step occur.

LapLink RNA accelerates even when you're locally connected to your network (either wired or wireless), but you'll notice the greatest improvement over a remote connection.

## When acceleration starts

LapLink RNA starts working as soon as you begin accessing files on the network. For instance, if you open a file in a word processor, or drag a file from the network to your desktop using Windows Explorer, LapLink RNA accelerates your access, opening and saving the file much faster than normal. To receive maximum acceleration benefits, connect to a LapLink RNA server first.

## Connecting to a LapLink RNA server

The first time you access network files, you're asked whether you want to connect to a LapLink RNA server.

**To designate a LapLink RNA server:**

Do one of the following:

1. When asked to select an RNA server, click Yes. If you don't know which server to connect to, or don't plan to connect to a server, click No.

or

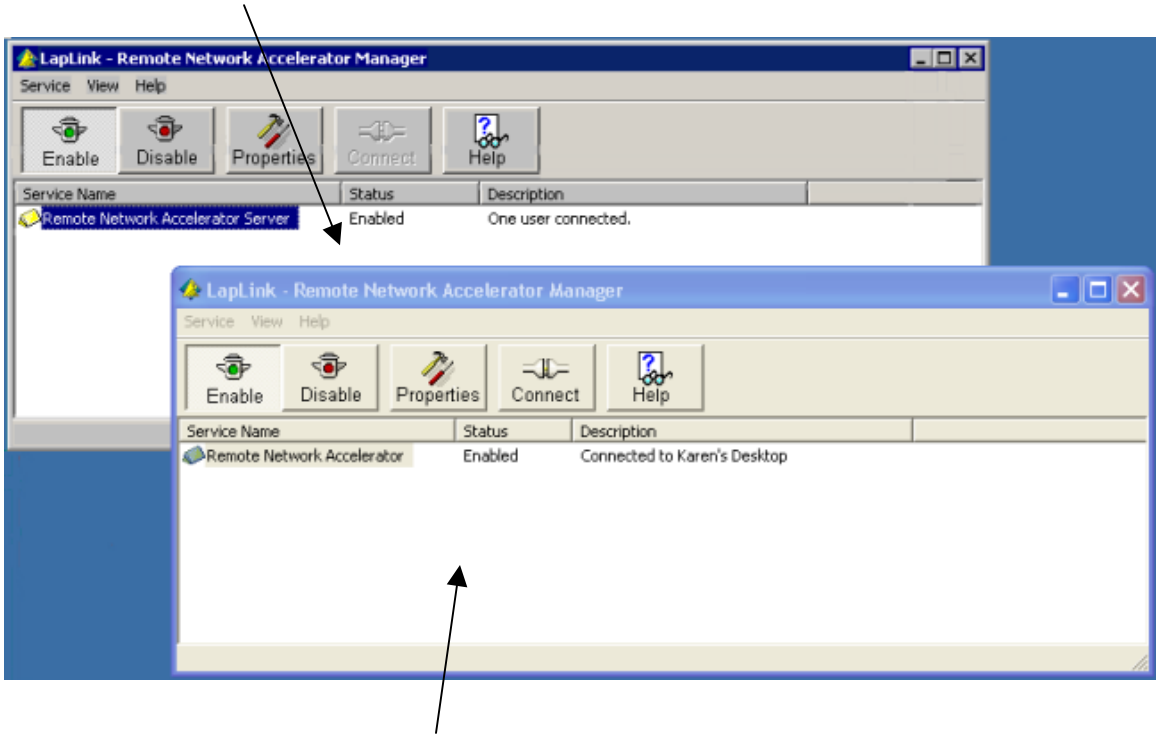
2. Open the RNA Service Manager in the Windows System tray and click the both Connect buttons.

then

3. Browse the list of available servers and select the one you want to use.
   If your workstation is not listed, type the computer's IP address in the IP address field. Click OK.
   **!TIP** Your network administrator can help you find the IP address, or go to LapLink's online knowledge base. Use this URL to locate instructions: http://www.laplink.com/support/kb/article.asp?id=204.

If you have disabled the LapLink RNA service, you must use the Connect button to create a connection after re-enabling the service.

LapLink RNA Server Service Manager




LapLink RNA Client Server Manager

## LapLink Remote Network Accelerator in Action – a Tutorial

You're likely to notice improvements right away when you open and save files remotely with LapLink RNA running. However, you can get a better sense of how much improvement you're really getting with LapLink RNA by working with files with and without RNA enabled. Try the demonstration below to see how much faster you can work using LapLink RNA. Acceleration is more noticeable over a remote connection; it is recommended that you try this demonstration over a phone line or an Internet connection.

Acceleration is usually perceptible immediately, but you might want to time each task in step three and step five to see exactly how much improvement you get.

**Step one: Disable LapLink RNA.**

1. Double-click the LapLink RNA Service Manager icon in the Windows System tray (right side of your taskbar).
2. Click the Disable button on the toolbar.

**Step two: Connect to the network as you usually do.**

**Step three: Perform the steps below and note how long each step takes.**

1. Copy a file from the network to your desktop, noticing how long it takes.
   **Note:** To see maximum results, avoid using uncompressible files like Zip or graphic files. While RNA will help you accelerate these files, it does so once the files are in the RNA cache.
2. Open a different file on your network, one that you can make changes to and save. A large file (one megabyte or larger) is recommended. For instance, you can use a word processing document containing several graphics.
3. Once the file is open, examine the file by scrolling or paging through it until you see all of the file. Note how long it takes to view the whole file.
4. Make a change to the file and save it, and then close the file. Again, notice the time it takes to finish.
5. Open the file again.
6. Close the file, and restart Windows.

Since some of the files you worked with might still be stored in memory, restarting Windows ensures that you get true acceleration results when performing this demonstration.

Since LapLink RNA is disabled, these steps are performed without any caching or compression.

**Step four: Enable LapLink RNA.**

1. Double-click the LapLink RNA Service Manager icon on the Windows taskbar.
2. Click RNA and click the Enable button on the toolbar.
   **!TIP** You must use the Connect button in the LapLink RNA Service Manager to reconnect to your RNA Server after the service is re-enabled.
3. Connect to your RNA Server.

**Step five: Repeat the steps in step three, noting how long each step takes now that RNA is enabled.**

1. Copy the first test file from the network to your desktop.
2. LapLink RNA is using compression and acceleration to place the file into the cache.
3. Open the second test file.
4. Once the file is open, examine the file by scrolling or paging through it until you see all of the file. Note how quickly you can view the whole file since you have connected to a LapLink RNA server, and the file is also added to the cache.
5. Make a change to the file and save it, and then close the file.
   LapLink RNA transfers only the changed part of the file to the network (using SpeedSync), so saving the file is much faster than before.
6. Open the file again.
   Since you just saved the file and there have been no changes to it, LapLink RNA opens it directly from the cache, without accessing the network.
7. Close the file.

After you've tried these steps, experiment with different types of files. Acceleration performance varies according to the types of files you're transferring, the speed of your connection, and your cache size.

# Understanding the Statistics

Now that you have used LapLink RNA, let's look at the RNA Service Manager and the Properties dialog. Open the Service Manager from the Windows System tray again, and click the Properties button.

## What do the statistics mean?

**Total Bytes Sent and Received** shows the total number of bytes that your computer has requested to receive from or send to the network.

**Unaccelerated and Accelerated** indicate how much of the information transferred over the remote connection is accelerated. LapLink RNA first looks in the cache to see if it can use data stored there. If possible, it uses SpeedSync to transfer only information that is not cached. It compresses the remaining data to the smallest size possible to transfer it quickly. All data that is found in the cache or compressed is accelerated data. The actual data that transfers across the connection is unaccelerated. The more accelerated bytes, the faster the transfer.

**Saved by Compression and Saved by Caching/SpeedSync** break down the accelerated statistic to show how that total was reached. If you access the same network files regularly, you will see a higher value in the Saved by Caching/SpeedSync statistic. Otherwise, most acceleration is a result of RNA's compression.

Check the acceleration ratio for a quick look at how much faster RNA makes remote access. Acceleration Ratio represents the level of acceleration achieved. A value of 300% means that RNA is making file access three times faster than it would be without acceleration.

**Average Speed** shows the average speed of data traveling across the connection when files are opened or transferred.

# Managing the Cache

Click the Cache tab of the Properties dialog for a look at how LapLink RNA used the cache feature during the tutorial.

## How does the cache work?

The cache is storage space on the hard disk of the computer you're using. When you access a network file away from the office, LapLink RNA places a copy of the file in the cache.
The next time you access the remote file RNA compares the version of the file in your cache with the version on the network. If the cached copy is the same, RNA opens the cached copy instead of the network file. This is much faster than accessing the file using the remote connection. LapLink's patented SpeedSync technology works with your cache to reduce the amount of information passed between the remote computer and the network. It cuts file transfer times by sending only the parts of a file that have changed since your last update.

When you copy, move, or edit a file, SpeedSync searches the target location (the network directory or the cache) for a file with the same name. If it finds one, SpeedSync compares the two versions to locate changes in the source file. It then copies, moves, or applies only the changes, not the entire file, to the target location. This means that far less information travels across your connection.

## Setting the cache location and size

Designate where LapLink RNA stores the cache by setting the location on the Cache tab in the RNA Properties dialog box. The cache can reside on any local hard disk drive, but not on a network, CD-ROM, or floppy disk drive.

Set the maximum size of the cache to specify how much disk space it can take up. LapLink RNA does not reserve the allotted space for its cache. You can set the cache to take up a large percentage of your disk, but still use that space for other purposes until LapLink RNA needs it. The LapLink RNA cache automatically removes its oldest files as it becomes full. There is no need to monitor or clear the cache contents manually to preserve space.

**To set the cache location and size:**

1. Open the RNA Service Manager by double-clicking its icon in the Windows System tray.
2. Double-click RNA, or click the Properties button.
3. Click the Cache tab.
4. Type a path in the Location box, or click the Browse button to search for a folder where you want to store the cache.
5. Be sure you specify a local hard drive (normally C: or D:).
6. Drag the Max Cache Size slider to the right or left to allow the cache to take up more or less disk space.
7. Click OK.

**To empty the cache**

1. Click the Clear Cache Now button.

### Recommending cache size

We 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.

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.

## Advanced Cache options

Click the Advanced tab of the Properties dialog to see other caching options.

### Securing the cache

Encrypt the data in the RNA cache to secure any important or restricted network files that LapLink RNA caches on your local hard disk. If you do not encrypt the cache data, it is possible that someone with access to your remote computer could read the cached information through the cache database.

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

**To secure the cache:**

1. Open the LapLink RNA Service Manager by double-clicking its icon in the Windows System tray.
2. Double-click RNA and click the Advanced tab.
3. Click Encrypt Cache Data so that it is checked, and then click OK.
   The Encrypt Cache Data option is off by default.

### Deciding whether to use write-behind caching

Write-behind caching uses the RNA cache to speed up write operations as well as read operations. Using write-behind caching when you make changes to a network file, LapLink RNA places information in your cache instead of constantly sending it to the network. LapLink RNA accumulates the changes in the cache until either your program requests it or you close the file. LapLink RNA then sends the changes to the network together in the background of your computer.

Write-behind caching improves your program's 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 you are using, the type of file you are editing, your hardware and software configurations, and how busy your system is.

Using write-behind caching slightly increases the risk of data loss. Because changes are sent to the network less frequently, if you are disconnected from the network while you are moving or saving a file, you could lose information.

The Use Write-behind Caching option is on by default.

## A few notes about the RNA Server

Our discussion of LapLink RNA to this point has been from the perspective of the client, and the end user's benefit.  Although the LapLink RNA Server is fairly self-explanatory, there are a few things to point out.

## Flexibility

LapLink RNA was originally conceived as an enterprise solution for slow RAS or VPN connections. This meant addressing the needs and concerns of IT managers, and assumed that the RNA server was installed on a network server.

During development, we discovered that LapLink RNA provides an individual with the same benefits when the LapLink RNA server is installed directly to his desktop computer (provided that the desktop meets the server's hardware and memory requirements).

LapLink RNA does not breach existing security policies, because it uses the authentication credentials of the user logged into the desktop.

## User Account

When LapLink RNA server installs, it create a user account on the network so that it can provide the access to the network files that the remote user requests.

This account, created during installation, is named "TSI_<users name>". This account is assigned a password by the user when the RNA server is installed. While the name can be changed, it should not be used for any other purpose.

**To change the LapLink RNA Server user account:**

1. Open the LapLink RNA Service Manager by double-clicking its icon in the Windows System tray.
2. Click the Properties button.
3. Click the Advanced tab and click the Set Password button.
4. Type a new password in the Password box, and confirm it by typing it again in the Confirm box.
5. Click OK.

## What do the RNA Server statistics mean?

The RNA Server's Service Manager displays information that a network administrator would need to know…who's connected, how long have they been connected, how is the traffic on the network affected by these users, etc. Access the Properties dialog in the same manner as you did on the client computer.

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

## LapLink Bandwidth Monitor

LapLink Bandwidth Monitor (LLBM), is a performance tool you install on the computer to monitor your network and Internet connections. Bandwidth Monitor displays statistics about your "data pipe," including how big it is, how much of it you are currently using, the size of the files currently in the pipe, and how much faster your data is traveling through the pipe due to LapLink software.

**To install Bandwidth Monitor:**

1. On the LapLink RNA Welcome screen, click Bandwidth Monitor.
2. Follow the prompts.

An icon (an animated line graph) is placed in the System tray.

To configure LLBM, click the icon and select Settings.

For more detailed information about LLBM, click Help and then Help Index from the menu.

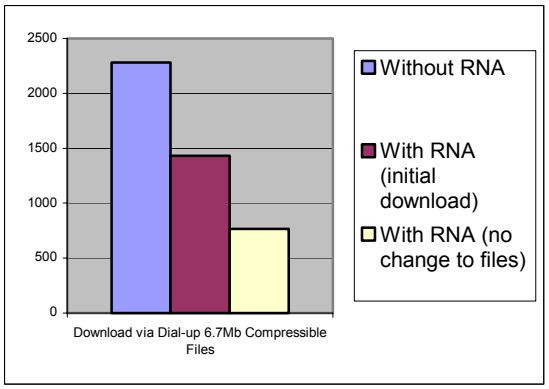
## Proving the Benefits - Performance Testing Results

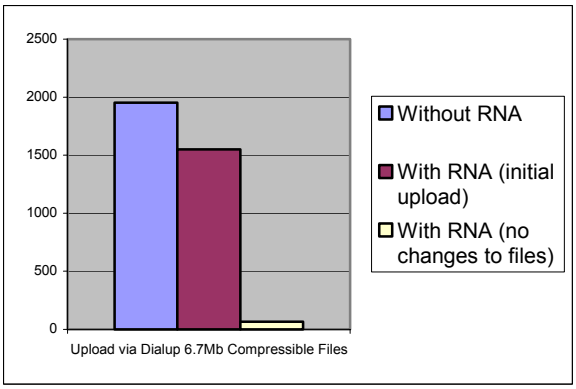
What evaluation guide is complete without performance results? Our test scenarios involved creating a VPN connection using a variety of physical connections… dial-up (56.K), wireless modem, DSL, and even a local 802.11 network. Using compressible files, LapLink RNA consistently showed that the combined technologies (acceleration, compression, caching, and SpeedSync) produce tangible benefits, such as

- Decreased the level of traffic on the network
- Minimizing or even eliminating bottlenecks on the network
- Delaying the expansion of the infrastructure
- Improved productivity for the end user
- Decreased Telco costs, especially if using a wireless data network

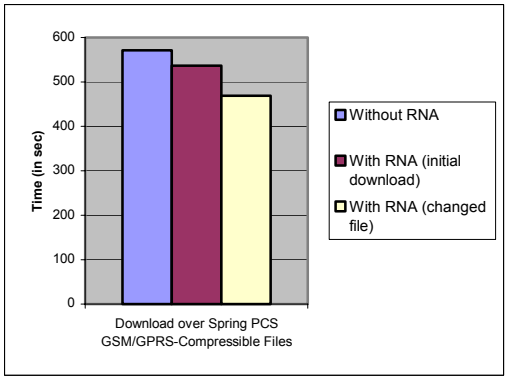
Here are the results of a few of the tests.

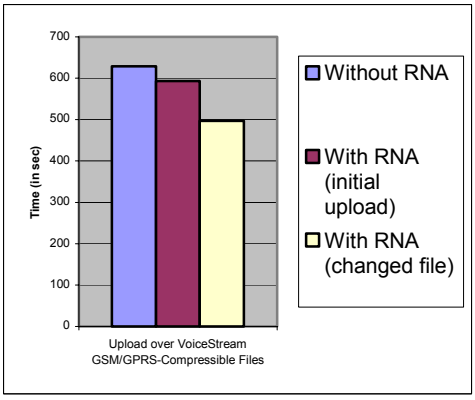
**Over a dial-up connection**




**Over a wireless modem connection**



# Contact Information

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