

# Btrieve 12

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## *Getting Started with Btrieve*



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# *About This Manual*

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This document contains information about installing and configuring Btrieve 12. It also contains information about common installation issues, general network protocol information, and Btrieve 12 optional features.

Some information in this document may not apply to you because certain features are supported only on other versions of Btrieve and PSQL products.

For information on using Btrieve utilities, see *Btrieve User's Guide*. For information about configuring the Btrieve engine, see *Advanced Operations Guide*.

## **Who Should Read This**

This manual provides information for users who install and run Btrieve 12. It is also useful for system administrators who are responsible for maintaining data files on a network and for those who are using Btrieve to develop applications.

We would appreciate your feedback. As a user of our documentation, you are in a unique position to provide ideas that can have a direct impact on future releases. If you have comments or suggestions for the product documentation, post your request in the community forum on the [Actian PSQL website](#).

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## Conventions

Unless otherwise noted, command syntax, code, and examples use the following conventions:

CASE	Commands and reserved words typically appear in uppercase letters. Unless the manual states otherwise, you can enter these items using uppercase, lowercase, or both. For example, you can type MYPROG, myprog, or MYprog.
<b>Bold</b>	Words appearing in bold include the following: menu names, dialog box names, commands, options, buttons, statements, and so forth.
Monospaced font	Monospaced font is reserved for words you enter, such as command syntax.
[ ]	Square brackets enclose optional information, as in [ <i>log_name</i> ]. If information is not enclosed in square brackets, it is required.
	A vertical bar indicates a choice of information to enter, as in [ <i>file name</i>   @ <i>file name</i> ].
< >	Angle brackets enclose multiple choices for a required item, as in /D=<5   6   7>.
<i>variable</i>	Words appearing in italics are variables that you must replace with appropriate values, as in <i>file name</i> .
...	An ellipsis following information indicates you can repeat the information more than one time, as in [ <i>parameter ...</i> ].
::=	The symbol ::= means one item is defined in terms of another. For example, a::=b means the item <i>a</i> is defined in terms of <i>b</i> .





# *Preparing to Install Btrieve*

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## *Preparation Needed for Btrieve Installation*

The following topics prepare you to install Btrieve by providing an overview of the requirements, a detailed checklist, and an installation FAQ.

- [Installation Requirements](#)
  - [Access Rights](#)
  - [Installation with Other Products on the Same System](#)
  - [Virtual Environments](#)
- [Installation Review](#)
  - [Quick Checklist](#)
  - [Common Preinstallation Questions](#)

## Installation Requirements

This section provides an overview of any special requirements you may need to know about in order to complete the Btrieve installation. The following overview is intended to accompany the software and hardware requirements listed on the [Actian PSQL website](#).

### ***Access Rights***

You must have full administrator-level rights on the machine where you install Btrieve.

### ***Installation with Other Products on the Same System***

You cannot install Btrieve 12 on the same system with any edition of Btrieve or PSQL later than Btrieve 6.15. You must remove those products first.

It is best practice to remove Btrieve 6.15 from the system before you install Btrieve 12. If necessary, Btrieve 12 can be installed on a system that already has Btrieve 6.15, but we recommend that you do not run both versions at the same time. In this mixed installation, you may see a status code 8020. If so, then you must use the PSA Clean utility to resolve the conflicts.

### ***Virtual Environments***

In a VM environment that supports live migration, an authorized Btrieve instance can move from one host to another host with no impact to your end users.

### ***Consistent Host Name***

An authorized instance of Btrieve can be moved to a different physical machine, or converted into a VM, or migrated to a different VM host. However the VM host name must remain the same. If the hostname must change, deauthorize the key for Btrieve before performing the move, conversion or migration. Each instance of Btrieve, including those that are cloned or copied for VMs, requires its own permanent key even if the host name is the same. See also, [License Administration Concepts](#) in *Btrieve User's Guide*.

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## Installation Review

This section provides you with a checklist to prepare you for installation and a set of commonly asked questions you should consider prior to installation. Please use this section as a review and a guide for a successful installation.

### Quick Checklist

This checklist provides a review of the requirements needed in order to install Btrieve. Each of these items should be met prior to beginning the install process.

- Your system hardware meets the minimum requirements to install Btrieve.
- Your operating system and network environment is supported by Btrieve.
- You have full administrator-level rights on the system where you plan to install Btrieve.
- You have reviewed the release notes in `readme_btrieve.htm` on the installation media for important, late-breaking warnings and information that could not be included as part of the user documentation but may be essential to your installation and use of the product.
- If you are using a proxy server, you need to configure it to allow authorization of Btrieve. Configure the proxy server before you install Btrieve, or omit product authorization during installation and authorize the product after configuring the proxy server. See [Authorization Access Through a Proxy Server](#) in *Btrieve User's Guide*.
- Your application vendor supports the Btrieve engine.



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**Tip** If you are unsure, contact your application vendor or review your vendor's documentation to confirm that they support the Btrieve engine version and mode that you want to install.

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### Common Preinstallation Questions

This section contains some of the most common questions asked prior to installing Btrieve. These questions represent special case scenarios that could possibly prevent a successful first-time installation. Before you begin installation, consider the situations represented by these questions, along with the Quick Checklist to determine if you have met all the requirements and if there are situations that need special attention.

#### Where do I install Btrieve?

Btrieve can be installed on the same computer where the data files are located, or it can be installed on other computers to access the data over the network.

#### How do I install my Btrieve engine in a Microsoft Active Directory environment?

The installation of the Btrieve engine in an Active Directory environment requires no special steps. Follow the installation steps as described in this manual for the product you have purchased.

You may install the Btrieve engine on a domain controller if you choose. Be aware that activity on the domain controller may affect the performance of the engine. For this reason, you may prefer to install Btrieve on a server that is not a domain controller.

### **Where do I install Btrieve to access web applications?**

For web applications, the Btrieve engine must be installed on the same computer as the web server. Multiple web server platforms require a Btrieve engine on each platform.

### **Does it matter where I download the Btrieve 12 installer?**

Yes, it does matter. If you are installing a downloaded version of Btrieve, do not place the installer in a location that is listed in the Path environment variables because this can cause issues with file copying during install. We recommend that you place the setup files in the Windows %temp% directory.

### **How do I install Btrieve in a Microsoft Terminal Services or XenApp environment?**

If you plan to install Btrieve to a Microsoft Terminal Server or XenApp environment, you must be logged on to the console of the server as a user with system administrator rights to install. This can either be the physical console on the server or a remote console session.

If you install the Btrieve engine in a Terminal Services Environment, install the engine to run as a service. The default for a fresh installation is to run as an application.

Only one instance of the Btrieve engine may run on any terminal server platform. You cannot run separate copies of the engine within two or more terminal sessions.



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**Note** If a user starts the Btrieve engine in a Terminal Services session or in a multiuser environment where fast-user switching occurs, other users on the system cannot access that engine nor can they start their own copy of the engine.

Status code 3032 results if a second user attempts to access another user's engine through the Btrieve engine.

If you need to have multiple local users accessing a local engine, run the engine as a service.

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### **How can I restrict users running in Terminal Services from changing Btrieve configuration settings and using the Monitor utility?**

Btrieve requesters running within Terminal Services client sessions can perform Btrieve administrative functions by default. For example, a user with such a client can change configuration settings for Btrieve and use the Monitor utility.

To restrict this capability, a system administrator should follow these steps:

- 1 In BTRCC under **Local Client**, open the properties for **MicroKernel Router**.
- 2 In the **Properties**, select **Restrict Administrative Functions from a WTS Client**.
- 3 Click **OK**, then exit BTRCC and restart it for the setting to take effect.

**Are there any special settings I need to make for my configuration that aren't listed here?**

Yes, there are some default settings in Btrieve that need to be adjusted if your configuration includes certain situations. For example, the default settings need adjustment if you have:

- Microsoft Active Directory Service
- Multiple network interfaces
- A network that is subject to outages
- Applications that use data file names that terminate with a space

Please review [Configuration for Special Installation Situations](#) for these or other relevant issues, especially if you encounter problems after installation.



# Upgrading from Btrieve 6.15

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## Considerations for Upgrading to Btrieve 12

If you are upgrading from Btrieve 6.15 to Btrieve 12, follow the procedure in [Installing Btrieve](#) just as you would if you were installing for the first time.

You cannot install Btrieve 12 on the same system with any edition of Btrieve or PSQL later than Btrieve 6.15. You must remove those products first.

It is best practice to remove Btrieve 6.15 from the system before you install Btrieve 12. If necessary, Btrieve 12 can be installed on a system that already has Btrieve 6.15, but we recommend that you do not run both versions at the same time. In this mixed installation, you may see a status code 8020. If so, use the PSA Clean utility to resolve the conflicts. See [Using PSA Clean](#) in *Advanced Operations Guide*.

## Considerations When Upgrading to Btrieve 12

After reading the latest product information, review this list of considerations to complete your upgrade installation preparation.

- ❑ *Vendor-Specific Information* - Check with your application vendors for any specific information regarding their product with Btrieve.
- ❑ *TCP/IP Protocol* - Make sure that your TCP/IP network is configured correctly (you should be able to ping the server by name), and that any firewalls between the clients and server (including firewalls on those computers) are configured to pass data access traffic. See [Windows FireWalls](#).
- ❑ *DOS Requester* - DOS applications are supported only through the BTRBOX requester. Native DOS machines should be migrated to a Win32 platform before upgrading. DOS applications are not supported on 64-bit Windows platforms, so they do not support BTRBOX.
- ❑ *Back Up Data Files* - Make sure you have a current backup of all your data, Btrieve files, and configuration before beginning an upgrade installation

## Common Questions about Upgrading to Btrieve 12

The most common questions involve licensing.

- A trial license is installed if you leave the license key blank during installation.
- To add and authorize a valid license after installation, see [License Administrator](#) in *Btrieve User's Guide*.
- For general information about licensing, see [License Administration](#) in *Btrieve User's Guide*.

If your installation does not go as expected, see [Troubleshooting After Installation](#) or get help online from the knowledge base at the [Actian PSQL website](#).





# *Installing Btrieve*

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## *Instructions for Installing Btrieve*

Use the following procedures for installing the Btrieve engine:

- [Before You Install the Btrieve Engine](#)
- [Installing Btrieve](#)

## Before You Install the Btrieve Engine

Before installing Btrieve, begin by reviewing the following documents for important information:

- ❑ [Preparing to Install Btrieve](#) - Provides important information including system requirements and platform specific notes that are relevant to your operation.
- ❑ [Release Notes](#) - Located in readme\_btrieve.htm on the distribution media and contain late-breaking news that could not be included in the user documentation.

### **Installation Tips**

- When installing Btrieve 12 for the first time on a system, the installer checks whether all of the needed system files meet the minimum requirements. In some cases, these files are locked by the operating system and a restart is required before the installer can continue. Click **Yes** to restart the system. The installer is then automatically restarted.
- It is strongly recommended that you restart your system if you encounter this message. If you do not restart your system, the installer encounters failures during engine and utilities configuration.
- If you have any trouble with the following installation, see [Troubleshooting After Installation](#).

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## Installing Btrieve

You can install Btrieve from a CD or using a self-extracting installer. The following steps use default installation choices.

### ► To install Btrieve

If the installation fails for any reason, the installation log file can be found in the Windows %temp% directory.

- 1 Launch the installation program from your Windows system.
  - Insert the Btrieve 12 CD in the CD-ROM drive or run the self-extracting installer.
  - If the CD installation does not start automatically, run the autorun executable in *drive*:\autorun\autorun where *drive* is the letter of your CD-ROM device.
- 2 In the installation selection dialog, click Btrieve 12 installation.

The installation program begins its initial preparation. After the preparation completes, the **Welcome** screen appears.
- 3 If prompted, close or uninstall any running applications that may interfere with the Btrieve installation.



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**Note** If you wish to leave one or more programs running that *may* interfere, you must click **Ignore** to continue. Unpredictable results may occur during the Btrieve installation if you ignore programs that may interfere.

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- 4 At the **Welcome** screen, click **Next**.
- 5 On the **License Agreement** page, read and accept the Software License Agreement, and then click **Next**.
- 6 Select the installation mode: **Run as a Service** or **Run as an Application**.

By default for a fresh installation, Btrieve 12 is installed to run as an application.

  - Select **Run as a Service** if:
    - You want to avoid User Access Control conflicts from the operating system. Running the Btrieve engine as a service requires the **Log On as Service** privilege. If you run the engine as a service under a user account other than the default Local System account, be sure that you modify the Log On Properties for the Service using the Windows Control Panel.
    - You want to run the Btrieve engine on a machine using a Terminal Services environment.
  - Select **Run as an Application** if the data files reside only on a remote machine, are accessed via drive mappings, and no engine is running on the remote machine.
- 7 Click **Next** to continue.
- 8 Click **Install** to begin installation.
- 9 A dialog appears when the installation wizard completes. The product has been installed with a trial key that expires at the end of a trial period.

You have two choices at this point: continue and authorize the product with a permanent key, or end the installation (and later authorize the product with a permanent key).

- If you choose to continue and authorize the product, an Internet connection is required. Click **Next** and continue with step 10. (If you have no Internet connection, click **Next** then click **Finish**. See [Alternative Authorization Tasks](#) in *Btrieve User's Guide*.)
  - If you choose to end the installation at this point, click **Next** then click **Finish**. (You may run the License Administrator utility at a later time to authorize a key. See [License Administration](#) in *Btrieve User's Guide*.) See also [Authorization of Btrieve Key on Windows with UAC](#).
- 10** To continue with authorization, enter your license key and click the button to authorize the key. (If you decide not to authorize the product at this point, click **Finish**. You may run the License Administrator utility at a later time to authorize a key. See [License Administration](#) in *Btrieve User's Guide*.)
- 11** A message box displays with the status of the authorization action. Perform one of the following actions depending on the status:
- If the authorization status message is “**key is authorized**,” click **OK**, then click **Finish** to complete the installation.
  - If the authorization status message reports an error or warning, click **OK**, and repeat step 10, ensuring that you enter a valid license key.
- 12** Register your product (recommended) as explained on the Registration page that displays, then close the Registration page.

If you are prompted to restart your system, please do so in order to ensure proper operation of your Btrieve product.



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**Note** The installation program modifies some Windows environment variables.

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### **Authorization of Btrieve Key on Windows with UAC**

You can encounter difficulty authorizing a permanent key for Btrieve on Windows with User Account Control (UAC) if the following conditions are all true:

- Btrieve was installed as an application.
- The Btrieve engine is running without administrative privileges. Note that, by default, applications run with privileges of a standard user unless the privileges are elevated. That is, even if you are a member of the administrator's group and you start the Btrieve engine without using Run as Administrator to elevate privileges, the engine runs with privileges of a standard user.
- A permanent key for Btrieve was not supplied during the installation process. That is, you chose to authorize the permanent key *after* installation by using a licensing utility.

Complete the following steps to ensure a permanent key is correctly authorized:

- 1** If the Btrieve application is running, close the application (stop the Btrieve engine by right-clicking the engine tray icon then clicking stop).
- 2** From File Explorer, locate the file w3dbsmgr.exe. Look for the file under <install\_drive>\Program Files (x86)\Actian\Btrieve\bin.

- 3** Right-click w3dbsmgr.exe, then click **Run as Administrator**. You must have administrative rights or know the password and name of a user with administrative rights. You need to elevate the privileges of the Btrieve engine before authorizing a key with a licensing utility.
- 4** Start License Administrator from operating system **Start** menu or **Apps** screen (or use the command line interface licensing utility if you prefer).
- 5** Enter the permanent key for Btrieve in the **Key** field, then click the button to authorize the key.
- 6** In needed, stop the Btrieve engine and restart it without elevated privileges.

Note that elevating the privileges for a license administrator utility is *not* the solution. The Btrieve engine itself, w3dbsmgr.exe, is what requires elevated privileges. However, in some environments you must also elevate the privileges of guilcadm.exe.



# *After Installing Btrieve*

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## *Answers to Common Postinstallation Questions for Btrieve*

The chapter contains the following sections:

- [Common Questions After Installing Btrieve](#)
- [Uninstalling Btrieve 12](#)

## Common Questions After Installing Btrieve

This section contains information that you should read after running the installation program. The questions apply to all of the Btrieve engine products unless specific products are mentioned. If you are having problems with your installation, go to [Troubleshooting After Installation](#) or get help online from the knowledge base at the [Actian PSQL website](#).

### Where are the Btrieve 12 files installed?

Table 1 lists the default locations where Btrieve 12 installs the program and application data files.

*Table 1 Btrieve Default Windows Installation Locations*

Platform	File Types	Default Installation Location
Windows (64-bit)	Btrieve Application Data	<drive:>\ProgramData\Action\Btrieve\
	Program Files (64-bit)	<drive:>\Program Files\Action\Btrieve\
	Program Files (32-bit)	<drive:>\Program Files (x86)\Action\Btrieve\
Windows (32-bit)	Btrieve Application Data	<drive:>\ProgramData\Action\Btrieve\
	Program Files (32-bit)	<drive:>\Program Files\Action\Btrieve\
	Program Files (16-bit)	<drive:>\Program Files\Action\Btrieve\
<b>Note:</b> The DOS Requester files are installed by default only on 32-bit Windows platforms in <drive:>%WINDIR%\SYSTEM32\		

### What is an application data file?

Application data files are typically files to which the Btrieve engine can write. Btrieve files are application data files.

### What is a program file?

Program files are typically files the system requires in order to function. Examples of program files include binary system files, executable files, dynamic link libraries and .jar files.

### What is the difference between 32- and 64-bit program files?

Microsoft guidelines recommend that 64-bit components are installed in a separate location from 32- and 16-bit components. Btrieve 64-bit components are installed in the 64-bit program files location and are registered in the Windows Registry under the 64-bit hive. Btrieve 32- and 16-bit components, as well as the DOS Requester files, are installed in the 32-bit program files location and are registered in the Windows Registry under the 32-bit (x86) hive.

### Does Btrieve install a Java Runtime Engine (JRE)?

Btrieve features require a local JRE. Btrieve installs this local JRE only if the minimum required JRE version is not already present on your system. If the minimum required JRE already exists, Btrieve features will use those files instead of installing another JRE. If it does install its own JRE, that local JRE is for use only by Btrieve.



### **How do I read the online documentation?**

The viewer for the documentation library is integrated into Btrieve Control Center (BTRCC). Access the documentation library through the BTRCC window in the Welcome view, in the Help menu, or by pressing F1.

You can also view the documentation in the form of Adobe Acrobat (PDF) files. These PDF files are available on the Btrieve installation media in the **Books** directory.

### **How do I verify or update my user license?**

Licenses from previous versions of Btrieve are not migrated or transferable to Btrieve 12. You must have a license applicable for Btrieve 12, unless you choose to install using the trial version of the product.

The License Administrator utility allows you to view and adjust the keys used to license the Btrieve product. For example, you can verify which keys have been authorized and check the number of authorizations remaining for a key. For a detailed discussion of the License Administrator utility, and a list of the tasks that you can perform, see [License Administration](#) in *Btrieve User's Guide*.

### **What user license was installed with Btrieve?**

A trial license is installed if you leave the license number blank during installation.

There is no configuration necessary for the license. After installation, you can use the License Administrator utility to view your installed licenses. See the *Btrieve User's Guide* for more information on the License Administrator utility.

### **Where To Go From Here**

If you had trouble during installation, or have questions regarding troubleshooting, see [Troubleshooting After Installation](#).

## Uninstalling Btrieve 12

The uninstall program removes Btrieve 12 and all related components from your system that were added by the installation program, including registry settings, configurations and Btrieve sample files.

The uninstall program does **not** remove the following:

- Btrieve 12 keys
- Btrieve files that you create under the Btrieve installation directories
- Btrieve files created in locations other than the installation directory for Btrieve

### ➤ To uninstall Btrieve

- 1 Use the Btrieve license administrator utility (GUI or CLI) to deauthorize the key that was used to authorize the product. This allows you to use the key for a different installation if you so choose. (See [To Deauthorize a Key](#) in *Btrieve User's Guide*, for example.)
- 2 In the Windows Control Panel, select **Programs and Features**.
- 3 Select the installed **Btrieve** product from the list.
- 4 Click **Change** then **Next**.
- 5 Click **Remove** then **Next** and follow any prompts during the uninstall.

If prompted, close or uninstall any running applications that may interfere with uninstalling Btrieve.



**Caution** Unpredictable results may occur during the uninstall if you ignore programs that may interfere.

---

Restart your system if prompted to do so.

# Configuring the Btrieve Engine

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## *Understanding the Available Engine Configurations*

The following topics discuss the concepts behind using the Btrieve engine. The configurations available for the engine are covered, as well as the procedures for setting them up. Instructions for setting up a Gateway configuration using the Gateway Locator utility are included.

- [Overview](#)
- [Setting Up a Small Client-Server Configuration](#)
- [Setting Up a Peer-to-Peer Configuration](#)
- [Setting Up a Gateway Configuration](#)
- [Running the Btrieve Engine as a Service](#)

## Overview

This section covers options for configuring a Btrieve engine. If you need more in-depth information about the engine, see the *Advanced Operations Guide*. That guide contains detailed technical information about the engine, setting up a gateway configuration, and redirecting locator files.

You are likely to configure Btrieve in one of three ways:

- [Small Client-Server Configuration](#)
- [Peer-to-Peer Configuration](#)
- [Gateway Configuration](#)

### Small Client-Server Configuration

This configuration can be used when all data is located on a single system with a Btrieve engine installed and data sharing is limited. It is roughly equivalent to a small client-server environment.

For instructions on creating this configuration, see [Setting Up a Small Client-Server Configuration](#).

### Peer-to-Peer Configuration

In environments where data is distributed among workstations, you can use Btrieve in a peer-to-peer topology. This configuration is used when each application typically stores much of its own data on the local hard drive, but it periodically needs to access data from other workstations or to share its own data with others.

In this configuration, each computer provides access to its data directory or directories using shared volumes. Any computer that needs data access maps drives to those shared volumes. Then the Btrieve engine on each computer acts as a server to read and write all changes to the data files on that machine.

For instructions on creating this configuration, see [Setting Up a Peer-to-Peer Configuration](#).

### Gateway Configuration

A third use case is an environment where data is stored on a file server that has no Btrieve engine. This can be a Unix server or other type of network file server that gets backed up regularly, but cannot support a Btrieve engine. In this situation, the first Btrieve engine that opens files in a directory on the server becomes the gateway to each file in that directory. The other workstations access the data in a client-server fashion through that Gateway engine.

The Gateway engine for a given directory identifies itself by creating a file named `~PVSW~.LOC` in that directory. This file is called a *Gateway locator file* and contains the network name of the computer where the Gateway engine is located. Other Btrieve engines then read the locator file to find the name of the engine they must communicate with in order to access its data.

You can ensure that the same engine always services the files in a given directory by making the locator file read-only. This is called a *static gateway*, also referred to as a *fixed gateway*. See [To set up a fixed gateway](#) for more information.

The Gateway engine acts as a server as it reads and writes pages to the data files, allowing it to make the most use out of its cache. The Gateway feature is designed so that the ownership of any particular directory can change whenever the current Gateway engine has no more client applications with any files open in that directory. When the last data file is closed in a directory by a given Btrieve engine, that

engine releases and deletes the locator file. When the next engine opens a data file, that engine becomes the new gateway to the directory where the data files reside.

For instructions on creating this configuration, see [Setting Up a Gateway Configuration](#). For more details on Gateway engine behavior, see the next topic.

### ***More About Gateway Engines***

A *Gateway engine* is a Btrieve engine that acts as the sole point of access to all data files in a particular directory on a remote file server. If several Btrieve engines are accessing the same data files at the same time, they do not all open the files simultaneously, nor do they share the files. Rather, the first Btrieve engine to access that data file becomes the temporary owner of those files, and all other Btrieve engines must access the file by contacting the Gateway engine. Only the Gateway engine has the file open and reads or writes to it. The other Btrieve engines act as clients, making requests to the Gateway engine acting as a server.

A Gateway engine comes into play only when no Btrieve engine is installed on the machine where the data files are, or when the engine on that system is not running.



---

**Caution** Make certain the Gateway computer does not shut down while users are still using it as a Gateway, or data loss can occur.

---

## Setting Up a Small Client-Server Configuration

As explained in [Small Client-Server Configuration](#), you should use this set up when you have only a few workstations sharing data located on a central computer where you have a Btrieve engine installed.

If you have data located on many computers, or if you do not or cannot install a Btrieve engine on the computer where the data is located, you should use one of the other configurations.

### ➤ To set up a small client-server configuration

- 1 You must have the Btrieve engine installed both on the central computer where the data is and on all computers expected to access the data.

Ensure that the Btrieve engine on the central computer where the data is located is operational each time the computer is started, before any other engines attempt to access the data. A Btrieve engine starts by default if installed as a server. By default, the engine is installed to run as a service. If the Btrieve engine was installed as an application, be sure that the application starts if the computer is restarted. See [Running the Btrieve Engine as a Service](#).



---

**Note** You may inadvertently fall into a Gateway configuration if the Btrieve engine on the machine where the data is located is not started when the computer is started. If another Btrieve engine attempts to access the data and the local Btrieve engine is not running, the other engine may establish itself as the Gateway for those data files.

You can resolve this situation by shutting down the computer where the data is located, and starting it again, while ensuring that no other computers request data before the local Btrieve engine is restarted. You may need to remove the file `~PVSW~.LOC` from the data directory to ensure the Gateway is not reestablished.

The best way to ensure that only the Gateway services the file is to set a static gateway locator file using the **Gateway Locator Utility**.

---

- 2 Share the directory where the data is located so that other computers can map a drive to the data directory.
- 3 Ensure that each workstation expected to access the data can access the files on the central computer. Setup is complete. The Btrieve engine on the machine where the data is located now acts as a mini-server, to fulfill all requests for data on that machine.

## Setting Up a Peer-to-Peer Configuration

As explained in [Peer-to-Peer Configuration](#), you should use this set up when you have workstations sharing local data as well as data located on many different machines, and each machine has a licensed Btrieve engine installed.

This configuration is similar to the small client-server configuration discussed above, except that now every Btrieve engine instance is sharing data as a server.

If you have data located on only one computer, or if you do not or cannot install a Btrieve engine on the computer where the data is located, you should use one of the other configurations.

### ► To set up a peer-to-peer configuration

- 1 You must have Btrieve engine installed on each computer where data is located, and installed on all computers expected to access the data.

Be sure that on each computer the Btrieve engine where the data is located is operational each time the computer is started, before any other engines attempt to access the data. A Btrieve engine starts automatically if installed as a service. By default, the Btrieve engine is installed to run as a service. If the engine was installed as an application, be sure that the application starts if the computer is restarted. See [Running the Btrieve Engine as a Service](#).



**Note** You may inadvertently fall into a Gateway configuration if the Btrieve engine on a machine where data is located is not started when the computer is started. If another Btrieve engine attempts to access the data and the local engine is not running, the other engine may establish itself as the Gateway for those data files.

You can resolve this situation by shutting down the computer where the data is located, and starting it up again, while ensuring that no other computers request data before the local Btrieve engine is restarted. You may need to remove the file `~PVSW~.LOC` from the data directory to ensure the Gateway is not reestablished.

The best way to ensure that only the Gateway services the file is to set a static gateway locator file using the **Gateway Locator Utility**.

- 2 On each computer where data is located, share the directory where the data is located so that other computers can map a drive to the data directory.
- 3 Be sure that each workstation expected to access the data can access its files.  
Also, ensure that each Btrieve engine instance can access any local data from its own physical drive.
- 4 Setup is complete. The Btrieve engine on each machine where data is located now acts as a server to fulfill all requests for data on that machine.

Each Btrieve engine instance also handles any local data access, that is, data file requests from applications on that machine for data that resides on the same machine.

## Setting Up a Gateway Configuration

As explained in [Gateway Configuration](#), you should use this set up only when you have data files on a computer where no Btrieve engine is installed.

If you have Btrieve engines installed on all machines, you should use one of the other configurations.



---

**Note** You may inadvertently fall into a Gateway configuration if the Btrieve engine on a machine where data is located is not started when the computer is started. If another Btrieve engine attempts to access the data and the local engine is not running, the other engine may establish itself as the Gateway for those data files.

You can resolve this situation by specifying a permanent Gateway as described in this section, or by shutting down the computer where the data is located, and starting it up again, while ensuring that no other computers request data before the local Btrieve engine is restarted. You may need to remove the file `~PVSW~.LOC` from the data directory to ensure the Gateway is not reestablished.

The best way to ensure that only the Gateway services the file is to set a static gateway locator file using the **Gateway Locator Utility**.

---

### ***Floating or Fixed Gateway***

You can set up two different Gateway configurations. The default behavior is a *floating* Gateway configuration. In this configuration, the first engine to open the remote data files becomes the Gateway engine for that directory until all files in the directory are closed. Then the next engine to open the data files becomes the new Gateway. This configuration is the most flexible, but also can entail delays upon initial connection to data files, as the engine checks for an existing Gateway engine.



---

**Note** Using a floating Gateway in a peer-to-peer configuration with multiple shared data sources is not recommended. This configuration is supported and it operates as designed, however, with multiple engines shuffling ownership among multiple data locations, connection delays may be significant. It is also possible to create a situation where a Btrieve engine on a remote machine serves as the Gateway for data located on your local hard drive. Obviously there is no reason to endure this delay when your local Btrieve engine can serve this data with higher performance.

You can avoid this situation by ensuring that the Btrieve engine on every computer is started when the computer is started. You must also ensure that someone logs on to each computer, because normally the engine doesn't start until a user logs on.

You can also avoid this situation by permanently assigning each machine as the Gateway for the data files located on it. See [To set up a fixed gateway](#) for information on how to perform this task.

---

The second configuration is called a *fixed* or *permanent* Gateway configuration. In this configuration, a specific engine is permanently assigned as the Gateway engine for a specific directory. If that engine is not running when another engine attempts to access the data, an error code results and the data is not available.



➤ **To set up a floating gateway**

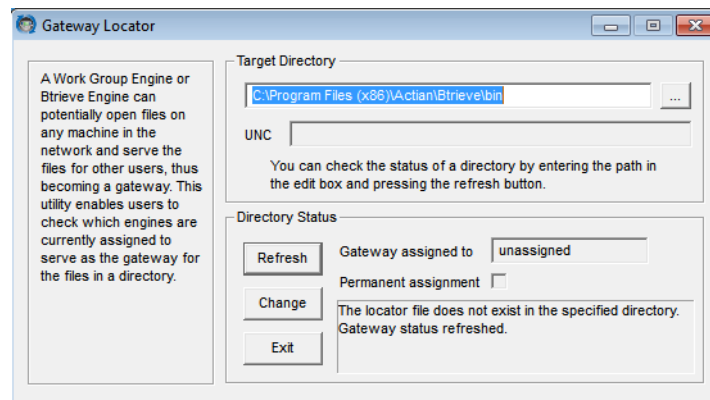
This is the default behavior. Be sure each Btrieve engine can access the needed files. The Gateway assignment now floats dynamically as different engines access data.

➤ **To set up a fixed gateway**

To set a permanent Gateway engine for a given directory, you need only change the attributes of the ~PVSW~.LOC file to read-only, once it contains the name of the desired engine. The following procedures give several ways to do this.

### **Using the Gateway Locator Utility**

- 1 Access Gateway Locator from the operating system **Start** menu or **Apps** screen.



- 2 Under **Target Directory**, open the directory for the data files needing a permanent Gateway.
- 3 Under **Directory Status**, click **Change**. In the dialog box, click **Assign a Gateway**, then enter or browse for the network name of the computer that you want to be the Gateway. Click **OK**.
- 4 Back in the main Gateway Locator window, select **Permanent assignment** and exit.

### **Using the DOS Command Line**

Use the ATTRIB +R command at a prompt to change the attributes of the ~PVSW~.LOC file.

### **Using Windows Explorer**

- 1 Right-click ~PVSW~.LOC in the directory needing a permanent Gateway and select **Properties**.
- 2 In the Properties window General tab, select **Read-only** under Attributes and click **OK**.

### **Working with the Gateway Locator Utility**

The Gateway Locator Utility provides control of and insight into any Gateway configuration you have on your network. This section explains how to use the utility for a variety of purposes.

This utility enables users to determine or change the Btrieve engine used as the gateway for the data files in a particular directory. The Gateway Locator operates by reading and manipulating the locator file ~PVSW~.LOC, which resides in any directory which is assigned a Gateway engine. If this file is in use, it is locked, and the Gateway Locator can only locate, not change, the engine being used as a Gateway for that particular directory.

➤ **To start the Gateway Locator Utility**

- 1 Access **Gateway Locator** from the operating system **Start** menu or **Apps** screen.



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**Note** The Gateway Locator can be used to set the gateway for any data directory. Data directory locations are not stored with the tool. Consequently, you must always set the directory path before you click **Change**.

---

- 2 In **Target Directory**, enter or browse for the directory path which contains the data files for which you wish to locate or change the Gateway engine.
- 3 The default target directory is the current working directory. Click the browse button to choose a different location.

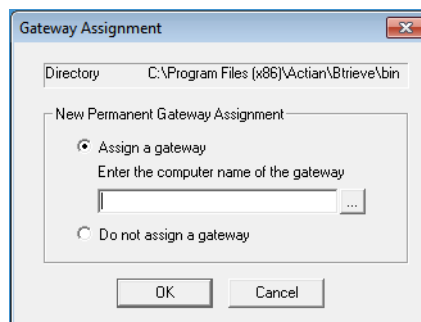
➤ **Locating the Gateway Engine**

Once the target directory is selected, clicking the **Refresh** button causes the name of the Gateway engine for that directory to appear in the **Gateway Assigned To** box. If no Gateway exists for a particular directory, the box indicates it is unassigned.

➤ **Changing the Gateway Engine**

Once the target directory is selected, click **Change** to choose the Btrieve engine to serve as Gateway for a particular directory. Note that this button is disabled if the locator file for that directory is locked.

If the locator file is unlocked, then the following dialog box appears:



Enter or browse for the system name you wish to serve as gateway.

## Running the Btrieve Engine as a Service

By default, the Btrieve engine is installed to run as a console application. However, running the engine as a service offers some advantages, such as allowing it to start automatically when the operating system starts without requiring a login. No system tray icon appears when you run the engine as a service.

### Configuration

To configure your Btrieve engine to run as a service, you must reinstall Btrieve 12. Choose **Run As Service** on the Engine Settings dialog box during installation. See [Installing Btrieve](#).



**Note** Running the engine as a service requires the **Log On as Service** privilege. If the service runs under a user other than the default Local System account, you must reset service logon properties.

Note that a valid user name and password are required to access remote Btrieve files. The system account has no rights to Btrieve files on other machines. If you want the Btrieve engine service to access remote data files, then you must provide a valid user name and password for the other machine, unless there is an engine running on that machine that can access the data instead. Open the properties for the service by double-clicking it in the Services list in the Windows Control Panel. In the **Log On As** section, select **This Account** and enter a valid user name and password.



### Stopping the Engine as a Service

You can stop the service just as you would any other Windows service. You can also stop it in BTRCC.

#### ➤ To stop the engine as a Windows service

- 1 In the Windows Control Panel, click **Administrative Tools**, then double-click **Services**.
- 2 Right-click the service named **Actian Btrieve Engine** and select **Stop**.

#### ➤ To stop the engine in BTRCC

- 1 In the BTRCC, expand **Services**.
- 2 Right-click **Btrieve Engine**.
- 3 Select **Stop Services**.



# *Configuring Engine Network Communications*

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## *How to Set Up Network Communication the Btrieve Engine*

The following topics review the types of network communication protocols supported with Btrieve and how to set protocol support for your network if you require different settings.

- [Engine Network Communication Settings](#)
- [Setting Up TCP/IP Support](#)

## Engine Network Communication Settings

This section lists the configuration settings used by the Btrieve engines for network communication. These settings may be changed using a command line utility or from within BTRCC on the engine properties.

*Advanced Operations Guide* provides detailed information about each of the settings. See the following configuration settings in *Advanced Operations Guide* for network communication:

- [Enable Auto Reconnect](#)
- [Listen IP Address](#)
- [TCP/IP Multihomed](#)

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## Setting Up TCP/IP Support

By default, TCP/IP is supported between local remote Btrieve engines or between multiple engines. If you have modified the default settings, read this section.

### ► To Enable Multihomed TCP/IP Support

Completing the following steps configures your Windows server to use two installed network cards.

- 1 Access **Btrieve Control Center (BTRCC)** from the operating system **Start** menu or **Apps** screen.
- 2 In Btrieve Explorer, double-click **Engines** to display the list of registered engines with BTRCC.
- 3 Right-click the target engine and click **Properties**.
- 4 Click **Communication Protocols** and click **TCP/IP Multihomed** to configure the server engine to listen for client connections on multiple network interfaces.

If you only have one network interface, this setting is ignored.

- 5 Restart the server engine for the changes to take effect. You do not need to make any changes to client settings.



**Note** If your server computer has two network interfaces and you set the value of **TCP/IP Multihomed** to **Off**, you must edit the setting **Listen IP Address** and set the TCP/IP address where you want the Btrieve engine to listen. If you do not set an IP address, the Btrieve engine will receive communications only from the first network interface to bind to the operating system. Because this can vary with driver installation, a working system can easily break after receiving driver updates. To avoid this problem, always set the **Listen IP Address** if **Multihomed** is turned off.

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# Configuring Network Communications for Clients

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## *How to Configure Network Communications for Your Btrieve Clients*

When your Btrieve application needs to access remote network files, it uses the local client requester on the machine where it is running, and communication with any remote system is handled automatically. Generally, the default configuration settings for Btrieve on the local and remote systems are sufficient for successful network communication. You typically do not have to change any settings on either system.

However, the following topics cover specific situations where changing the defaults or adding certain configuration features can offer some advantages:

- [Client Network Communication Settings](#)
- [Network Path Formats Supported by Btrieve Requesters](#)
- [IPv6](#)
- [Using TCP/IP to Connect to a Windows Server](#)
- [Default Communication Ports](#)
- [Using the DOS Requester](#)
- [DOS Box Support on Windows](#)

## **Client Network Communication Settings**

The following topics cover the configuration settings used by the Btrieve clients for network communication. These settings may be changed using a command line utility or from within BTRCC.

The *Advanced Operations Guide* provides detailed information about each of the settings. See the [Enable Auto Reconnect](#) configuration setting in *Advanced Operations Guide* for network communication:

## Network Path Formats Supported by Btrieve Requesters

When using your Requester, you connect to the Btrieve engine to access data files. This section shows the variations on network file syntax you can use to access files on your network using Btrieve applications.

Btrieve supports the Universal Naming Convention (UNC) and drive path formats (explicit and current) across its supported platforms.

For more information on the path formats, see the sections that follow:

- [Universal Naming Convention \(UNC\) Path Formats](#)
- [Drive-based Formats](#)

If you are an application developer, also note that the certain access methods, such as the Btrieve API, support URI connection strings. For details about URI strings, see [Btrieve URIs](#) in *Btrieve Programmer's Guide*. In *Btrieve API Guide*, see [Create \(14\)](#), [Open \(0\)](#), and [Login/Logout \(78\)](#).

### ***Universal Naming Convention (UNC) Path Formats***

The following UNC path formats are supported on all clients to all servers:

```
\\ServerName or <IP address>\share\path\file
```

```
\\ServerName or <IP address>\share:[\]path\file
```

UNC syntax is resolved correctly regardless of the actual type of network operating system (NOS) running on the target server. If you use an IP address, it must be a dotted IPv4 address or one of the two formats supported for IPv6. See [IPv6 Addresses](#).




---

**Note** In all instances above, backslashes (\) can be interchanged with forward slashes (/) except for the double backslash (\\). The syntax [\] indicates that the backslash is optional.

---

### ***Drive-based Formats***

The following drive representations are supported on all clients to all servers:

```
drive:file
drive:[\]path\file
file
[\\]path\file
..\file
```

## IPv6

A Btrieve client using any of the access methods supported by Btrieve connects using IPv6 to an IPv6 host running the Btrieve engine the same way as it does for IPv4. That is, the client specifies a server and connects through one of the supported access methods. The server can be either the name or IP address of the machine running Btrieve.

All of the Btrieve access methods support IPv6 connections.

The following topics address aspects of IPv6:

- [IPv6 Addresses](#)
- [IPv6 and the Btrieve Engine](#)
- [Frequently Asked Questions about IPv6](#)

### IPv6 Addresses

Raw IPv6 addresses can be written as 8 colon-separated segments where each segment is a 4-digit hexadecimal value. For example, 1234:5678:90ab:cdef:1234:5678:90ab:cdef. Within this framework, several forms of IPv6 names are possible.

### Recommendations for Numeric IPv6 Addresses

In general, numeric IPv6 addresses are more complex and difficult to manipulate than IPv4 addresses. Numeric Link Local addresses are notably problematic, especially with regard to Zone IDs.

For that reason, we recommend the use of host names through DNS servers, LLMNR, host files, or other means of address resolution, particularly for production environments. Btrieve support for numeric IPv6 addresses is intended mainly for development environments. Because many contexts require square brackets for IPv6 numeric addresses, when in doubt, add them if numeric addresses are necessary.

### Unicast Addresses

Btrieve supports only unicast addresses. The following are the unicast address formats that can be used with Btrieve.

*Table 2 IPv6 Unicast Address Formats Supported by Btrieve*

Unicast Address Format	Description
Loopback	<p>The local loopback address, which in IPv6 is 0:0:0:0:0:0:0:1. The loopback address can be abbreviated to ::1.</p> <p>The IPv6 loopback address is equivalent to the IPv4 loopback address of 127.0.0.1.</p>

Table 2 IPv6 Unicast Address Formats Supported by Btrieve

Unicast Address Format	Description
Global	Global addresses have a 64-bit prefix where the first 3 bits are always 001, the next 45 bits are set to the global routing prefix, the next 16 bits are set to the subnet ID and the last 64-bits are the interface ID.  Example: 2001:db8:28:3:f98a:5b31:67b7:67ef
Link Local	Link Local addresses are used by nodes when communicating with neighboring nodes on the same link. Link Local addresses have a 64-bit prefix where the first 10 bits are set to 1111 1110 10, the next 54 bits are set to 0 and the last 64 bits are the interface ID. The link local prefix is often represented as FE80::/64.  Example: fe80:0:0:0:713e:a426:d167:37ab (which may also be specified as fe80::713e:a426:d167:37ab)  See also <a href="#">IPv6 and the Btrieve Engine</a> .

## IPv6 Address Modifiers

IPv6 includes address modifiers that can act as shortcuts or can specify the destination in more detail. Btrieve supports the following ones for IPv6.

Modifier	Explanation
::	Represents one or more colon-separated zeroes. For example, ::1 is equivalent to 0:0:0:0:0:0:0:1. The :: modifier can be used only once within an IPv6 address.
%	Represents the Zone ID or interface of a destination node. On Windows, a Zone ID is an integer that specifies the zone of the destination for IPv6 traffic. Zone IDs are primarily used with Link Local addresses to disambiguate those addresses.  See <a href="#">IPv6 and the Btrieve Engine</a> .

## Address Presentations

Btrieve supports IPv6-literal.net names and bracketed IPv6 addresses.

### IPv6-literal.net Names

An ipv6-literal.net name is a raw IPv6 address with three changes:

- The colon ":" is replaced with a hyphen "-".
- The percent sign "%" is replaced with the letter "s".
- The whole address is appended with ".ipv6-literal.net".

### Examples

Initial Addresses	fe80::713e:a426:d167:37ab%4 2001:db8:28:3:f98a:5b31:67b7:67ef
Modified Addresses	fe80--713e-a426-d167-37abs4.ipv6-literal.net 2001-db8-28-3-f98a-5b31-67b7-67ef.ipv6-literal.net

### Bracketed IPv6 Addresses

A bracketed IPv6 address is a raw IPv6 address with square brackets around it. This format is also referred to as a Uniform Naming Convention (UNC)-safe address.

Examples:

Initial Addresses	fe80::713e:a426:d167:37ab%4 2001:db8:28:3:f98a:5b31:67b7:67ef
Modified Addresses	[fe80::713e:a426:d167:37ab%4] [2001:db8:28:3:f98a:5b31:67b7:67ef]

**IPv6 and the Btrieve Engine**

The following table lists the restrictions on the use of IPv6 with the Btrieve engine.

Table 3 IPv6 Restrictions for Btrieve Engine

Restriction	Discussion
Btrieve engine in an IPv6-only environment	The Btrieve engine is supported in an IPv6-only environment on Windows Vista and later operating systems.
UNC paths do not allow certain special characters, such as colons, that are part of IPv6 addresses	Avoid raw IPv6 addresses. Wherever possible, use host names. See <a href="#">Address Presentations</a> and <a href="#">Recommendations for Numeric IPv6 Addresses</a> .
Square brackets are required for raw IPv6 addresses when the address is used in a URI or UNC	Raw IPv6 addresses, abbreviated or not, must be enclosed by square brackets if the address is used in a URI or UNC.  Examples: <ul style="list-style-type: none"> <li>btrv://czjones:&lt;password&gt;@[2001:b1::23]/?file=c:/demodata.mkd</li> <li>btrv://abanderas:&lt;password&gt;@[2001:12:34:56:78:90:12:23]/?file=c:/demodata.mkd</li> <li>\\[2001:12:34:56:78:90:12:23]\acctsvr1\Domestic\file.mkd</li> </ul> Failure to bracket the IPv6 address results in status code 3014 or 3103 for Btrieve calls using a URI, or status code 11, 94, or 170 for Btrieve calls using a UNC.
In a URI, if you include a ZoneID to a server address, the “%” ZoneID character must be escaped with “%25”	If you use a btrv:// connection with an IPv6 address, you must escape the ZoneID for the host name. Zone IDs are usually required with IPv6 Link Local numeric addresses.  Example:  A UNC-safe addresses like  btrv://@[fe80::20c:29ff:fe67:2ee4%4]  must be changed to  btrv://@[fe80::20c:29ff:fe67:2ee4%254]

## Frequently Asked Questions about IPv6

The following table answers some frequently asked questions (FAQs) about IPv6 support and Btrieve.

Table 4 FAQs About IPv6 Support and Btrieve

Question	Answer
Does a network environment that includes both IPv4 and IPv6 affect Btrieve user counts?	No. The Btrieve engine uses one user count for each <i>unique</i> incoming protocol from the same client computer session. IPv4 and IPv6 are just different address formats of TCP/IP.
Because Btrieve Clients can have both IPv4 and IPv6 addresses will confusion result over how many licenses are required?	No. This is not a new situation. In the past, Clients have sometimes had more than one IPv4 address. Btrieve handles the situation by recognizing all of the addresses of a machine to identify it. Btrieve follows the same logic for multiple addresses using more than one IP version.
Any restrictions with IPv6 and the use of License Administrator?	Yes. The Btrieve <i>licensing server</i> does not yet support IPv6. Because of this, you can use License Administrator over IPv6 to administer licenses. However, to <i>authorize</i> a license with License Administrator, the utility must be running on a machine that uses IPv4 to communicate with the Btrieve licensing server.
Can Auto Reconnect be used with IPv6?	Yes. See <a href="#">Btrieve Auto Reconnect</a> in <i>Advanced Operations Guide</i> .
Does Btrieve support IPv6 in virtual machine environments?	Yes.
Can the Listen IP Address configuration setting be set to multiple addresses?	Yes. See <a href="#">Listen IP Address</a> in <i>Advanced Operations Guide</i> .
Which GUI utilities support IPv6? <sup>1</sup>	Function Executor, License Administrator, Monitor, BTCC, and Rebuild.
Which command line interface (CLI) utilities support IPv6? <sup>1</sup>	Bcfg, bmon, butil, cilcadm, cilcadm64, pvdbpass, rbdcli <sup>2</sup> , and w64cilcadm.
<p>1 Some utilities accept UNC path formats that may not be valid for the operating system, file system, or file sharing protocol.</p> <p>2 Rbdcli partly relies on direct file access for proper operation. Any file paths specified on a rbdcli command must also be directly accessible through the file system of the operating system or through a file sharing protocol such as Windows File Sharing. One method to verify valid file paths for rbdcli is to ensure that the paths work with operating system commands such as "dir" or "ls."</p>	

## Using TCP/IP to Connect to a Windows Server

The following topics document the use of TCP/IP to access Btrieve files on a remote system.

### **Configuring a Client for the Server IP Address**

When Btrieve operates in a TCP/IP network, your client must be able to resolve the IP address of a remote system. In most cases, your network management will resolve the address. In some cases the networks may be under separate management and you will have to set up a static IP address resolution. To enable this, you can edit the hosts file to enter a relationship between a system name and an IP address.

#### ➤ **To edit the hosts file on your Windows client**

- 1 Find the hosts file on your Windows machine.

For example, on some Windows platforms it is found here:

```
%WINDIR%\SYSTEM32\DRIVERS\ETC\HOSTS
```

- 2 Edit the hosts file with a text editor.
- 3 Enter your server IP address and name in the hosts file as a new line as shown in the following example. Your network administrator can provide you with the IP address.

```
# the following is an example of a hosts file entry for IPv4 address  
146.23.45.2      acctserver
```

### **Preventing the Windows Dial-Up Network Dialog Box from Opening When Using a Btrieve Application with TCP/IP**

Depending on the settings for your browser, the **Windows Dial-Up Networking** dialog box can open when a TCP/IP request is made. Usually, this is to make an Internet connection, but this feature can be an annoyance when using Btrieve applications and TCP/IP.

#### ➤ **To prevent the Dial-Up Networking dialog box from opening automatically**

- 1 In **Control Panel**, double-click **Internet Options**.
- 2 Click the **Connections** tab.
- 3 Clear the **Dial whenever a network connection is not present** option (select one of the other options, such as **Never Dial a Connection**).



## Default Communication Ports

Btrieve communicates through two ports. Your firewalls and routers need to allow access to the following ports for remote access to the MicroKernel engine:

- 3351 for the Btrieve engine
- 139 for named pipes (used by Windows for authentication to the operating system)

### Windows FireWalls

The installation of Btrieve 12 performs certain actions pertaining to firewalls. Starting with Vista, Windows operating systems include Windows Firewall with Advanced Security, which provides firewall profiles (a group of security settings). These operating system enable the firewall by default. The following table summarizes the Btrieve installation actions pertaining to the active profiles.

Table 5 Installation Actions for Windows Operating Systems

Active Firewall Profile <sup>1</sup>	Rules Added for the Btrieve Service	State of Rules After Installation <sup>2</sup>
Multiple, such as <ul style="list-style-type: none"> <li>• Domain</li> <li>• Private</li> <li>• Public</li> </ul>	<ul style="list-style-type: none"> <li>• Domain – Yes</li> <li>• Private – Yes</li> <li>• Public – Yes</li> </ul>	<ul style="list-style-type: none"> <li>• Domain – Enabled</li> <li>• Private – Enabled</li> <li>• Public – <b>Disabled</b></li> </ul>
Public only	Yes	Enabled
<p><sup>1</sup> "Active" means that the profile is monitoring network connections.</p> <p><sup>2</sup> An "enabled" rule means that inbound TCP and UDP traffic can communicate with the Btrieve service on all ports for any network connection managed by that firewall profile.</p>		

As the table shows, if the Public profile is active *with one or more other active profiles*, the Btrieve rules are added for the Public profile but are *disabled*. Neither the interactive nor the silent installation of Btrieve can be modified to change this behavior. If you want to enable the rules for the Public profile, you must do so manually. See [To enable Btrieve rules for the Public profile](#).

#### ➤ To enable Btrieve rules for the Public profile

- 1 Open the console for Windows Firewall with Advanced Security.
- 2 Click **Inbound Rules** in the left pane.
- 3 Locate the desired Btrieve rule in the list in the center pane.

Note that the rules are listed twice. The enabled rules (indicated by a check mark on a green circle) apply to profiles other than Public. The disabled rules apply to the Public profile.

- 4 Right-click on the disabled rule you want then click **Properties**.
- 5 Click the **Advanced** tab. Ensure that the Public profile is selected. If not, select it.
- 6 Click the **General** tab, then click the **Enabled** option.
- 7 Click **OK**.

- 8 Exit the console for Windows Firewall with Advanced Security.

### ***Profile Changes After Installation***

If you change a network profile *after* installation of Btrieve, Btrieve may no longer be able to accept communications. For example, assume that only the Private network profile was active during installation. At some point after installation, the active profile is changed to Domain (assume its settings are very different from those of Private). The Btrieve engine will no longer be able to communicate across the network.

If you change profiles or firewall rules in a way that prevents Btrieve communications, refer to the steps in [To enable Btrieve rules for the Public profile](#). Use the steps as a general guideline for how to enable the Btrieve rules for the active profiles. This will allow the Btrieve engine to communicate again across the network.

### ***Notes About Policies***

A corporate policy may prevent a local administrator from modifying the firewall profiles on a particular machine (that is, the profile is “locked”). If so, the Btrieve installation cannot add or enable the firewall rules required for the Btrieve engine to communicate across a network connection monitored by a locked profile. For such a situation, you should contact a corporate systems administrator and request that the firewall policy be modified to allow inbound TCP and UDP traffic on all ports to communicate with the installed Btrieve service.

Also be aware that a Group Policy only prevents the installation from adding and enabling rules on firewall profiles controlled by the Group Policy when the target system is joined to the domain. If the user installing Btrieve is logged into the target system as a local user instead of as a domain user, the installation **does** add and enable the rules on the firewall profiles. However, the rules are **disabled** if the target system is later joined to the domain controlling the Group Policy.

## **Using the DOS Requester**

On Windows 32-bit systems, Btrieve 12 supports DOS Btrieve applications with the DOS Requester. This section explains how to use the DOS requester to run Btrieve-based DOS applications in Windows.

DOS Box support allows a DOS application to run in a DOS box on a Windows platform. This enables direct communication to Windows 32-bit components rather than to the Btrieve engine. This configuration can be used with either a local or a remote Btrieve engine. The TCP/IP protocol is supported for client-server access.

## **DOS Box Support on Windows**

The Requester for Windows is BTRBOX. You can use this Requester for DOS applications running on 32-bit Windows systems.

### ***Running DOS Applications on Windows 32-bit Platforms***

All of the components needed to run DOS applications using BTRBOX are installed with Btrieve 12. The default DOS application support installed is the Win32 DOS Box configuration.

DOS applications are not supported on 64-bit Windows platforms. Therefore, BTRBOX is not supported on 64-bit Windows platforms.

### **Using DOS Box Support**

The DOS Box installation configures the drivers to be completely transparent. Thus, you are able to immediately open a command prompt and run a DOS Btrieve application. The config.nt file, located in the %WINDIR%\SYSTEM32 directory, contains the command that enables DOS application support. This file is similar to config.sys in DOS. The Windows operating system loads the driver for each DOS session opened. In the configuration file, the installation places the following path to load the DOS Box driver:

```
device = C:\Windows\System32\btrdrv.sys
```

# *Application Configuration Scenarios*

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chapter

8

## *Common Scenarios for Setting Up Your Btrieve Engine*

The following topics explain the Btrieve engine configuration settings for some common environment scenarios:

- [Terminal Services](#)
- [Multiple Client Applications](#)
- [Concurrent Remote and Local Applications](#)
- [Accessing Data on Other Computers](#)

## Terminal Services

Microsoft Terminal Services is a multisession environment that provides remote computers access to Windows-based programs running on a server.

### ***Disabling Administrative Functions***

In Btrieve 12, Btrieve requesters running within Terminal Services client sessions can perform Btrieve administration by default. For example, a user with such a client can change configuration settings for Btrieve and use the Monitor utility.

If you want to restrict this capability, a system administrator can disable it.

#### **➤ To disable remote administrative functions for Terminal Services clients**

- 1 In BTRCC under **Local Client**, open the properties for **MicroKernel Router**.
- 2 In the **Properties**, select **Restrict Administrative Functions from a WTS Client**.
- 3 Click **OK**, then exit BTRCC and restart it for the setting to take effect.



**Note** Btrieve engines are supported for use with Microsoft Terminal Server and Citrix XenApp running within an Active Directory environment.

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### ***Terminal Server as Network Server***

You may use your terminal server as your main network server and data file server. However, if you have high usage of the server as a file server as well as many terminal sessions running at the same time, you may find the performance less than satisfactory.

Another concern is having all of your mission critical services on the same machine. If it goes down, all of your services go down at once.

For both these reasons, you may wish to consider distributing your mission critical services on two or more computers.

## Multiple Client Applications

Sometimes, two or more client-server applications may use the same Btrieve engine. You will need to configure the engine differently depending on whether the applications are used at the same time.

If your vendors supply configuration guidelines for engine configuration parameters, you will need to adjust your configuration based on these guidelines.

### If the applications run concurrently (that is, if two or more applications are using a Btrieve engine at the same time) ...

You should configure the engine by adding together all the recommended values for each parameter. For example, if one application vendor suggests **Performance Tuning | Number of Input/Output Threads** should be set to 4, and another application vendor suggests this parameter should be set to 8, then you should set it to 12.

If the default value is higher than the sum of the recommended settings, then do not change the default value.

Do not add up the recommended values for any buffer size settings, or log file size settings. Use the largest recommended setting. Again, do not change the default if it is larger than any vendor recommendation.

### If the applications do not run concurrently (that is, if only one application is running at any given point in time) ...

You should configure the server by using the largest recommended value for each parameter. For example, if one application vendor suggests **Performance Tuning | Number of Input/Output Threads** should be set to 4, and another application vendor suggests this parameter should be set to 8, then you should set it to 8.

If the default value is higher than the largest recommended setting, then do not change the default value.

## Settings Affected by Multiple Applications

Most engine settings are not affected when you are running multiple applications. This section explains the settings that may need to be adjusted for multiple applications.

### Data Integrity | Transaction Durability

Some applications may require durable transactions, while others may not. If you have two application vendors recommending different values for this parameter, then you should set it to **On**. Generally, having transaction durability turned on does not affect applications that do not use transactions, but may slow performance.

## Concurrent Remote and Local Applications

With proper configuration, the Btrieve engine can respond to concurrent requests from remote clients and local applications.

➤ **To configure data connections from both remote and local applications**

1 In Btrieve Explorer, expand **Engines** to display the engines registered with BTRCC.

2 Right-click the target engine and click **Properties**.

3 Click **Access**. In the right-hand pane, select the **Accept Remote Requests** check box.

If you wish to prevent the server from accepting client connections from other computers, clear the check box.

4 Click **OK**.

This configures the server to accept remote requests.

5 In the Btrieve Explorer, expand **Local Client**.

6 Right-click **MicroKernel Router** and click **Properties**.

7 Click **Access**. In the right-hand pane, select the following check boxes:

- **Use Local MicroKernel Engine**. Select this check box to configure the local engine for local file access.
- **Use Remote MicroKernel Engine**. Select this check box to access data files on other computers.

If you plan to only access data on this computer, clear this check box.

8 Click **OK**.

This configures the server to accept local requests.

9 Restart the server engine to implement the changes.



**Note** See *Advanced Operations Guide* for more information on changing settings using Btrieve Control Center.

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## Accessing Data on Other Computers

The Btrieve engine provides supports a variety of small networked environments. The table below explains the most common configurations and where to look for more information. In any of the configurations below, a Btrieve engine must be installed on every computer that is expected to access data.

*Table 6 Summary of Network Configurations*

Configuration	For more information
Small client/server: Data resides on a single computer where a Btrieve engine is installed.	<a href="#">Setting Up a Small Client-Server Configuration</a>
Peer-to-Peer: Data resides on two or more computers where Btrieve engines are installed.	<a href="#">Setting Up a Peer-to-Peer Configuration</a>
Gateway: Data resides on a file server where no Btrieve engine is installed, or it is not running.	<a href="#">Setting Up a Gateway Configuration</a>



# Troubleshooting After Installation

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## *How to Proceed When You Encounter Errors After Installation*

Btrieve provides several features and tools that help to prevent configuration and installation problems. Some of these utilities are installed and run as part of the installation process and all can be run later to evaluate settings and troubleshoot problems. They are shown in Table 7.

This chapter contains the following sections:

- [Troubleshooting Tools](#)
- [Troubleshooting Strategies](#)
- [Logged Messages](#)
- [Configuration for Special Installation Situations](#)
- [Verifying the Btrieve Engine Is Running](#)
- [Obtaining File, Client, and Engine Version Number](#)
- [Engine and Client Version Conflicts](#)
- [Troubleshooting Common Btrieve Issues](#)
- [Issues After Uninstalling Btrieve](#)
- [How to Get Additional Help](#)

## Troubleshooting Tools

The following table describes tools to help you avoid or solve problems.

*Table 7 Btrieve Tools that Assist in Installation and Problem Determination*

Feature/Component	Function	For More Information
Btrieve Message Logging	Logged messages can be of type status, information, warning, or error, and can originate from any Btrieve component.	See <a href="#">Reviewing Message Logs</a> in <i>Advanced Operations Guide</i>
Gateway Locator	Determines or changes the Gateway being used.	See <a href="#">Configuring the Btrieve Engine</a> .

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## Troubleshooting Strategies

Typically, your installation process completes with no problems. However, this depends on a number of factors, including proper network support, and operating system configuration. If something does go wrong during an installation, Btrieve offers some tools that can help in diagnosing the problem. This chapter explores some of the troubleshooting techniques that you can use.



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**Note** If the installation fails for any reason, the installation log file can be found in the Windows %Temp% directory.

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### ***Checklist for Problems***

- Did you see any error messages displayed during installation?
- Does the network function correctly?
- Do you have the appropriate administrator-level privileges?
- Is the engine running?
- Is the client software correctly functioning?
- Are there errors in the pvsw.log file?

### ***Troubleshoot the Problem***

The rest of this section contains procedures that you can use in verifying your installation.

- [Logged Messages](#)
- [Configuration for Special Installation Situations](#)
- [Verifying the Btrieve Engine Is Running](#)
- [Obtaining File, Client, and Engine Version Number](#)
- [How to Get Additional Help](#)

## Logged Messages

Messages logged by Btrieve can help you troubleshoot problems. Messages can be of type status, information, warning, or error, and can originate from any Btrieve component. Certain messages specific to licensing issues originate only from the license administration components. In either case, Btrieve writes messages to the following logging features:

- Operating system event log
- Btrieve event log (pvsw.log)

Some messages, such as those about licensing, are entered in both logs. Other entries may not appear in both places. Btrieve-related events can of course be expected in pvsw.log, but when you are troubleshooting problems, it is good practice to check both logs.

For logging details, see [Reviewing Message Logs](#) in *Advanced Operations Guide*. For status code details, see [Status Codes](#) in *Status Codes and Messages*.

## Configuration for Special Installation Situations

This topic lists some scenarios where the *default* configuration settings for Btrieve need adjusting for proper data operations.

The following table summarizes some of these situations. If you find that your configuration matches an issue, please see the reference included for more information.

If your computing environment includes...	Then you need to:
Multiple network interfaces	Enable a configuration setting for Multi-homed setting  In <i>Advanced Operations Guide</i> , see: <ul style="list-style-type: none"> <li>• <a href="#">TCP/IP Multihomed</a></li> <li>• <a href="#">Listen IP Address</a></li> </ul>
A network that is subject to outages	Enable a configuration setting that tries to auto-reconnect to a server when a network outage occurs <ul style="list-style-type: none"> <li>• In <i>Advanced Operations Guide</i>, see <a href="#">Btrieve Auto Reconnect</a>.</li> </ul>
Applications that use data file names that terminate with a space	In the Application Characteristics properties for the Microkernel router in BTRCC, turn off the Embedded Spaces setting.

## Verifying the Btrieve Engine Is Running

If you have installed Btrieve as an application, you can use the following methods to verify that a Btrieve engine is running. A method is also provided for Btrieve installed as a service.

➤ **To start the Btrieve engine as an application**

Click **Start Btrieve Engine** from the operating system **Start** menu or **Apps** screen.

By default, Btrieve allocates resources and is ready to respond to local application data access requests.

➤ **To stop the Btrieve engine as an application**

Click **Stop Btrieve Engine** from the operating system **Start** menu or **Apps** screen.

➤ **To start the engine as a Windows service**

- 1 In the **Windows Control Panel**, click **Administrative Tools**, then double-click **Services**.
- 2 Right-click the service named **Action Btrieve Engine** and select **Start**.

➤ **To stop the engine as a Windows service**

- 1 In the **Windows Control Panel**, click **Administrative Tools**, then double-click **Services**.
- 2 Right-click the service named **Action Btrieve Engine** and select **Stop**.



**Note** You will receive a warning message when trying to stop the engine if any of the following is true:

- There are active clients.
  - No activity took place since the engine was loaded.
  - Fewer than 10 seconds have elapsed since the last operation took place.
-



## Obtaining File, Client, and Engine Version Number

You can use Btrieve utilities to verify that the client and engines have the version number you expect, or to check the version of a particular file.

### Determining Client and Engine Version

You can check the engine and client versions using Function Executor or the BUTIL command line utility. Function Executor is a utility that simulates Btrieve client operations using the Btrieve requesters.

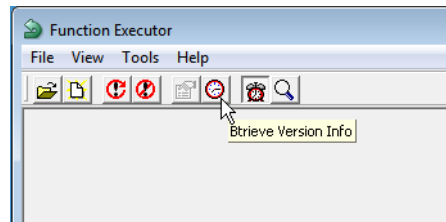
### Using Function Executor

Use Function Executor to determine the version of the client, local and remote engines.

#### ► To determine the engine version using Function Executor

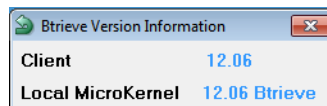
- 1 Access **Function Executor** from the operating system **Start** menu or **Apps** screen.
- 2 Do one of the following:
  - a. Click **View > Btrieve Version** from the **File** menu.
  - b. Select the **Btrieve Version Info** toolbar button, as shown in Figure 1.

Figure 1 Selecting the Btrieve Version Info button



- 3 After choosing either of the **Version** options, a dialog box displays that indicates the version of the client requesters and the local engine. If a file is open when the **Version** option is selected, the remote engine version displays as well.

Figure 2 Btrieve Version Info Display



### Using the BUTIL Utility

From a command prompt, enter the following:

```
BUTIL -VER
```

The requester and engine versions are then displayed. You cannot determine the version of a remote server engine with this tool.

## Determining a File Version

You can determine the file version of a MicroKernel data file using the Btrieve utilities Function Executor, the Btrieve Maintenance utility, or its command line version BUTIL. The following instructions provide information on using these methods.

- [Using Function Executor](#)
- [Using BUTIL Command Line Utility](#)
- [Using the Btrieve Maintenance Utility](#)

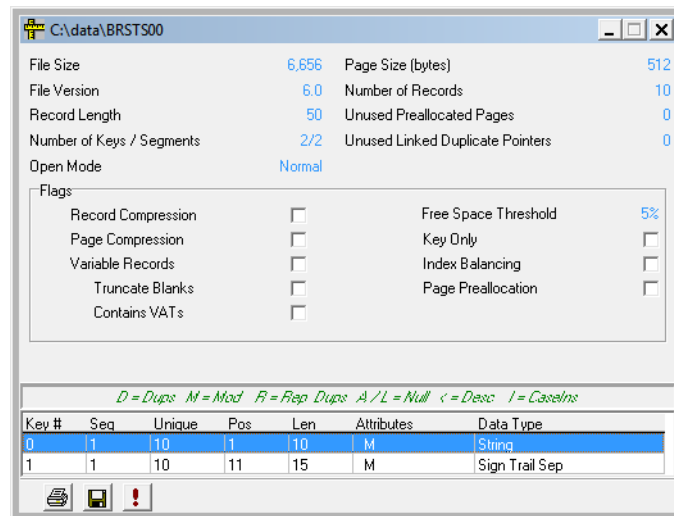
### Using Function Executor

Since Function Executor can simulate Btrieve operations, you can use it to determine a file version by performing a statistics report against the file.

#### ➤ To determine the file version using Function Executor

- 1 Access Function Executor from the operating system Start menu or Apps screen.
- 2 From the File menu, click File then Open.  
The Open Btrieve File dialog box displays.
- 3 Enter or browse for the file for which you need to determine the version.
- 4 With the file open in Function Executor, click View then File Statistics.

The File Statistics dialog box displays the file version at the top:



The Function Executor utility is documented in more detail in *Advanced Operations Guide*.

### Using BUTIL Command Line Utility

Use the -stat parameter of BUTIL to query the file statistics, which includes information about:

- File version
- Pages
- Records
- Keys

Type the following at a command prompt:

```
butil -stat <filename>
```

The BUTIL utility is documented in more detail in *Advanced Operations Guide*.

### Using the Btrieve Maintenance Utility

If you are unfamiliar with the command line, you can use the GUI-based Btrieve Maintenance utility.

➤ **To determine the file version using the Maintenance utility**

- 1 Access **Maintenance** from the operating system **Start** menu or **Apps** screen.
- 2 From the **File** menu, click **Options** and select **Show Information Editor**.  
The **File Information Editor** dialog box displays.
- 3 Click **Load Information** and the **Select File** dialog box displays.
- 4 Enter or browse for the file for which you need to determine the version.

The version appears in the upper right-hand corner of the dialog box.

## **Engine and Client Version Conflicts**

We recommend that you use client requesters that are the same version as the Btrieve engine.

Client requesters that are a *newer* version than the engine may or may not function correctly. We do **not** guarantee that newer versions of client requesters will function correctly with older versions of the engine. Therefore, we recommend that you **avoid** the use of newer version client requesters with an older engine.

## Troubleshooting Common Btrieve Issues

This section outlines problems you may encounter during the installation or when first using the Btrieve product.

### **I receive Status 7224 or my license is no longer listed in the License Administrator utility.**

When the Btrieve is installed as an application, you may experience this situation. Applications do not automatically inherit the user's administrative rights. You can stop the engine, run it as administrator, and then run the command line license administrator or GUI License Administrator as administrator to authorize the license. Another alternative is to install Btrieve engine to run as a service. See [Running the Btrieve Engine as a Service](#).

### **I fail to see the effects of my configuration changes.**

Try stopping and then restarting the Btrieve engine. Whenever you make a change to engine configuration components, you must stop and restart the engine for the changes to take effect. For information on how to start and stop the engine, see [Verifying the Btrieve Engine Is Running](#).

### **Why do I (now) receive Status 95, after running my application successfully?**

Your application has lost its session with the Btrieve engine. This can happen if you make changes to your configuration settings and must restart the engine, as in the troubleshooting example given above. At the moment the engine is stopped, any application that is running loses its session with the engine. You must stop all those utilities and restart them in order to reestablish communication.

See the *Status Codes and Messages* manual for more cases in which this status code can be returned.

### **Why can't I restart my application after an improper program exit?**

Btrieve engine components may remain in memory if the engine is interrupted improperly.

#### **➤ If you cannot restart your program after improperly aborting the application by using Ctrl-C or stopping the process:**

- 1 Shut down and restart your system.
- 2 Avoid terminating applications in an abnormal manner.

### **How Do I Access the Btrieve documentation?**

#### **➤ To access the documentation**

- 1 Access **Btrieve Control Center & Documentation** from the operating system **Start** menu or **Apps** screen.
- 2 Click the desired manual on the Welcome page. If the Welcome page has been closed, click **Help > Welcome**.

## **Issues After Uninstalling Btrieve**

When you uninstall Btrieve, you should not have any Btrieve files remaining on your system other than data files. However, some actions such as restoring archived components can cause a significant number of files to be left on your system. This is a side-effect of how the installation process works with the Windows operating system.

In the situations described previously, the files are left because Windows has the files marked with usage counts that indicate that they are being used by more than one program, and therefore the uninstallation program does not remove them from your system. This is expected behavior, but it may lead you to conclude that the Btrieve uninstall program is not functioning correctly.

## **How to Get Additional Help**

If you encounter problems during or after the installation that are not covered in the user documentation, please contact Actian Corporation and we will address your problem promptly.

### ***Technical Support***

If you still have questions or problems relating to your Btrieve installation, you can obtain help from the Actian Technical Support.

