



## ■ What's New in NFS Maestro™ Family



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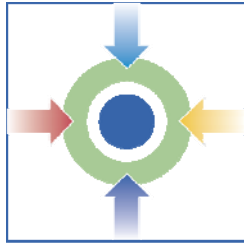
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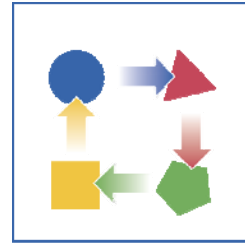
# Hummingbird Connectivity™ 2008

Hummingbird Connectivity is a suite of technology solutions that help organizations meet the challenges of integrating heterogeneous systems while providing cost effectiveness. Our customers have been instrumental in our development efforts, over the years and together we have achieved success. Hummingbird Connectivity continues to deliver unparalleled product functionality and substantive return on investment.



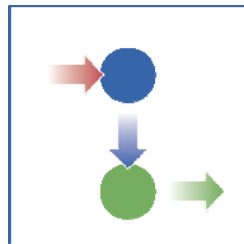
## Consolidation

Many organizations with numerous connectivity software vendors have been able to consolidate their needs into one single solution with Hummingbird Connectivity, helping them realize significant savings on their overall IT budgets



## Migration

Regardless of your current connectivity solution, Hummingbird Connectivity offers you a smooth migration path with minimal business disruption and immediate return on investment.



## Security

Hummingbird Connectivity features a robust and complete security set across all of its components, in order to help organizations meet their security and compliance objectives.



## Productivity

Employees are companies' most important assets. Hummingbird Connectivity provides users with unique ways of increasing their productivity while reducing the complexity associated with implementation and delivery.

# NFS Maestro™ Product Family

The unique features of NFS Maestro product family have been designed and developed with the objective to improve the product's leadership in the following domains.

## Features of NFS Maestro™ Product Family

### Consolidation



The NFS Maestro product family is the world's most advanced and secured PC NFS solution. It is designed to work with the most current NFS servers and clients in the market.

The NFS Maestro product family can satisfy most corporate connectivity needs by providing TN3270, TN5250, VT, NFS Client, NFS Server and FTP in a single software package.

Companies can achieve significant cost savings by reducing the number of different solutions in use and replacing them with a single complete connectivity solution.

It can also be used with any supported 32-bit and x64 Microsoft® Operating System, including Citrix Presentation Server® and Windows® Terminal Server.

### Migration



HostExplorer®, either as a major component of NFS Maestro or a standalone, full-feature terminal emulation software, offers the best migration path from Attachmate™ Extra, NetManage Rumba®, IBM® Pcom and WRQ Reflection on the market.

Not only does it allow organizations to convert existing macros automatically (Extra, Rumba and PCOM only), it also offers unparalleled integration with HLLAPI based 3rd party applications.

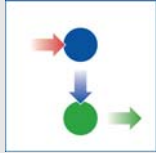
With HostExplorer, Hummingbird Connectivity raises the bar again by offering the administrator with the ability to distribute "Themes" to his users.

HostExplorer Themes contain pre-packaged settings for a variety of terminal settings such as menus, toolbars, keyboard, colors, sounds and many others.

By using themes, the administrator will be able to quickly re-create a familiar environment to its users, thus reducing the cost of migration and business disruption.

HostExplorer comes with standard themes for Attachmate Extra, NetManage Rumba, IBM Personal Communication™ and WRQ Reflection.

### Security



NFS Maestro is developed based on the RFCs that govern the behavior of Network File System protocol. NFS Maestro is the first in the industry to have integral support for Kerberos and LIPKEY.

NFS Maestro also supports other security features, such as full ACL support and SASL authentication method.

Security conscious customers can also choose SSL and Secure Shell 2 protocols to protect data communication initiated by other components that come with NFS Maestro, such as VT, TN3270, TN5250 and FTP.

### Productivity



The NFS Maestro product family offers administrators and users many valuable productivity features, allowing companies to improve their employee's efficiency.

Administrators are given the ability to remotely manage NFS Maestro products running on various Windows platforms across the network using a management framework that is tried, tested and true — Microsoft Management Console. Thanks to this feature, the software management complexity is simplified and efficiency is increased.

NFS Maestro Server™ Enterprise Edition and Gateway are designed to function in a Microsoft Cluster environment. Administrators can take advantage of this feature when offering the NFS server or gateway functionalities to the user communities with full confidence that the NFS resources are highly resistant to network and hardware failures.

## Introducing NFS Maestro Server Enterprise Edition

The mainstream enterprise storage strategy is to consolidate islands of data across disparate storage systems into a well-organized and easy-to-manage data storage center where administrators can efficiently manage an increased volume of data with decreased overhead. The secondary, but equally important, objective of this strategy is to ensure the ease of access by users from Windows® and UNIX® universe alike. Such a strategy requires the Network File System (NFS) protocol to bridge the Windows/UNIX barrier and allow fluent data sharing between Windows and UNIX servers and users.

Hummingbird Connectivity responds to this new enterprise storage strategy with NFS Maestro Server Enterprise Edition, the newest member of the NFS Maestro product family. With a design that will satisfy the most stringent demands from IT storage professionals, and fulfill the most critical requirements for sharing data between Microsoft® Windows Servers and UNIX workstations, NFS Maestro Server Enterprise Edition is the most advanced PC NFS server available in the market. Certified for use on Microsoft Windows Vista and Microsoft Windows Server 2003, NFS Maestro Server Enterprise Edition is a powerful and cost-effective component that fits superbly in your enterprise storage strategy.

Since NFS Maestro Server Enterprise Edition is a solution that aims at fulfilling enterprise storage requirements therefore, features such as Windows Vista and Windows Server 2003 certification, support for Microsoft Cluster technology and advanced usage of the Name Mapping Server come standard with the solution. Also, due to the fact that the expected user base is much larger in enterprise environments and the NFS resource usage rate is higher than normal, NFS Maestro Server Enterprise Edition also allows unlimited NFS connections and an unlimited number of exported file systems.

The following table is a summary of the core competency of NFS Maestro Server 2008 Enterprise Edition.

Features	NFS Maestro Server Enterprise Edition
NFSv4 Support	Yes
Certified for Windows Vista	Yes
Support for x64 Architecture	Yes
Certified for Microsoft Windows Vista and Microsoft Windows Server 2003	Yes
Storing Name Mapping Data in LDAP	Yes
Support for Microsoft Cluster	Unlimited
Maximum Number of Client Connections	Unlimited
Maximum Number of Exported File Systems	Unlimited

## Features Summary

General Features	Summary
Windows Vista Certification	The Hummingbird Connectivity 2008 products have received the “Certified for Windows Vista” Logo and were vigorously and exhaustively tested by a Microsoft-authorized third-party laboratory under their finalization.
Support for LIPKEY	Support LIPKEY as an alternative GSS provider for RPCSEC_GSS authentication. Our LIPKEY implementation is based on the LIPKEY protocol as specified in the RFC2847 as of May 2006.
Full Support for Unicode	Support Unicode throughout the entire product family.
Directory Services & Name Mapping Server Features	Summary
Multiple Directory Services Profiles	Allows users and administrators to configure up to 10 directory services profiles for each directory services type. The huge selection of directory services ensures that each NFS connection can be individually and independently authenticated by the most appropriate directory service.
Name Mapping Server Supports for ADAM	ADAM stands for Active Directory Application Mode. Essentially, it is a new feature included in Windows® Server 2003 which offers the flexibility that some organizations need while keeping the infrastructure costs low. In the NFS Maestro Server Enterprise Edition, administrators can turn any Windows running ADAM into the repository of the Name Mapping data.
Intelligent Name Mapping Cache	In any large enterprise, name mapping data stored in the Name Mapping Server can be so huge that rebuilding it may take hours, rendering the server inoperable. That’s name mappings data are cached on the disk once it is successfully created. Upon restarting the Name Mapping service, the Name Mapping Server will load these mappings while it rebuilds a new one in the background.

NFS Maestro Solo & NFS Maestro Client Features	Summary
Symbolic Link Creation Over NFSv4 Connections	The functionalities of the Create Symbolic Link Wizard and its command-line equivalent tool have been extended to allow users to create and delete symbolic links over NFSv4 connections.
Support for Multiple Directory Service Profiles	With the increased number of directory services profiles, users can customize each NFS connection to authenticate against different directory services and to select different GSS providers and services type; this gives users and administrators the ultimate control of how an NFS share should be accessed.
NFS Maestro Gateway Features	Summary
Support for Multiple Instances of Gateway Shares	This feature gives users the ability to create multiple Windows shares, each with individual unique permissions, for any existing NFS connection. This is the NFS reflection of what Windows can do to the native Windows resources.
NFS Maestro Server Enterprise Edition Features	Summary
New NFSv4 Features	<p><b>Delegation</b> — A performance enhancing feature that is achieved through aggressive client caching. It allows the NFS server to delegate particular operations to NFS clients, reduces over-the-wire network traffic and reduces the latency associated with it.</p> <p><b>SECINFO</b> — Supports NFS clients that want to use SECINFO to determine the authentication type required for a given file's access.</p>
Optimized Data Transfer	Optimized for several file access patterns. Administrators can freely set the software to adapt to any one of those patterns in order to yield the best performance.
Customizable Mount Paths	Users can configure the mount path name by giving it an alternative name other than the one that is automatically set as default by the software. It helps reduce the complexity of the Mount name, which in turn can reduce confusion and mistakes when users trying to access those shared resources.

SETGID Option	This feature raises and lowers users' access privileges, giving them the necessary rights to execute commands.
Other Server Features	<ul style="list-style-type: none"><li>• Support Sharing Folders in Volume without Drive Letters</li><li>• Improved User Interface for NFS Maestro Server Console</li><li>• Support for Timeout Value for Volume Shadow Copies Cache</li><li>• Support for Kerberos on Microsoft Cluster Environment</li></ul>

## Feature Details

### Windows Vista Certification

The following Hummingbird Connectivity solutions have received the “Certified for Windows Vista” certification and are available on both 32-bit and 64-bit platforms:

- Exceed PowerSuite™ 2008
- Exceed 2008
- HostExplorer® 2008
- NFS Maestro Solo 2008
- NFS Maestro Client 2008
- NFS Maestro Server 2008 Enterprise Edition
- Connectivity Secure Shell™ 2008
- Connectivity SecureTerm® 2008



### Support for Connectivity LIPKEY

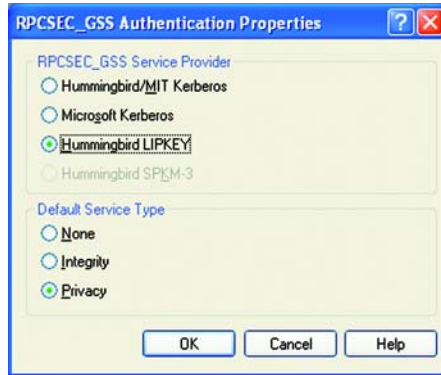
#### A Security Feature That Applies to All NFS Maestro Products

NFSv4 protocol (RFC3530) specified that NFS client and server must be able to provide end-to-end security for all RPC connections. Mandatory security built-in to the protocol is absolutely necessary in order for the protocol to survive and thrive in the modern computing environment where effortless and secured access from any network is the key. The task of negotiating security for NFS protocol falls onto the shoulders of RPCSEC\_GSS framework. RPCSEC\_GSS uses the functionalities of GSS-API which allows various security mechanisms to be easily implemented by the RPC layer. RFC3530 further mandated that a conforming NFSv4 implementation must implement security based on Kerberos v5 and LIPKEY, which stands for Low Infrastructure Public Key.

Kerberos v5 implementation can be found in NFS Maestro product family even before NFSv4 protocol was finalized, but it is in NFS Maestro 2008 where you will find the LIPKEY support. LIPKEY, unlike Kerberos, requires an uncomplicated infrastructure. While Kerberos is an excellent solution for secured authentication, its usage is limited to Intranet or Extranet where administrators of different Kerberos realms can communicate with each other and establish trust relationships for per-realm key exchange. In contrast, LIPKEY behaves very much like SSL; it allows a user with only a user name and password to access a server with a public key certificate. Because of the simplicity of this mechanism, LIPKEY is highly suitable for Internet

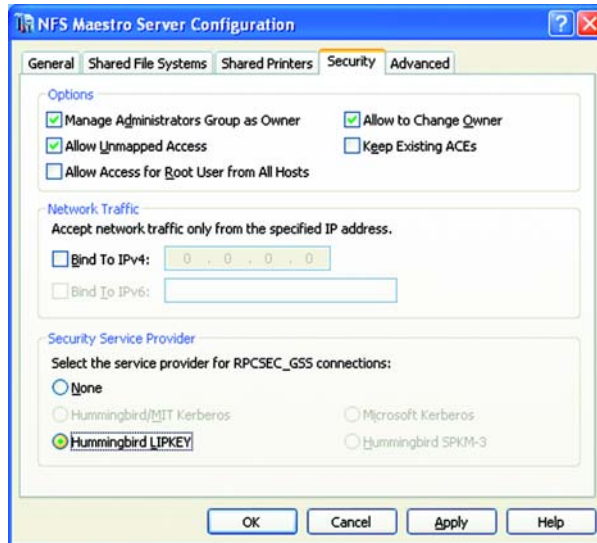
operations, which is one of the long term goals of NFSv4: to improve access and performance on the Internet.

Figure 1  
LIPKEY is one of the supported GSS providers



All products in the NFS Maestro product family support LIPKEY as an alternative GSS provider.

Figure 2  
All NFS Maestro products support LIPKEY authentication.



At the time of the launch, LIPKEY protocol is still under development, therefore, Hummingbird's LIPKEY implementation is based on LIPKEY protocol as specified in the RFC 2847.

For more information on LIPKEY, please read IETF RFC 2847.

## Full Support for Unicode

### A General Feature That Applies to All NFS Maestro Products

Unicode is the universal character encoding which provides the basis for processing, storage and interchange of text data in any language in all modern software. Over the past decade, Unicode has been gaining overwhelming support from the industry and implementation can be found on many operating systems.

Support for Unicode in the NFS Maestro product has existed since NFS Maestro 2006, but the scope of implementation was limited. In this release, we have expanded the scope to completely cover all aspects of all product components: from the crucial components such as Name Mapping Server, which will support Unicode user names, to the folder names of the shared file systems.

## Name Mapping Server Supports for ADAM

### A Name Mapping Server and NFS Maestro Server Enterprise Edition Feature

Riding on the success of LDAP-based solutions and combining it with the engineering and marketing prowess of Microsoft, Active Directory is quickly becoming one of the most successful implementations of LDAP directory service in the market.

Active Directory (AD) provides all benefits of an LDAP directory service with the added native support for the Microsoft operating systems, making it an irresistible choice of any enterprise that needs a centralized mechanism for authentication, authorization, PKI deployment, yellow pages access and more. However, because AD is such a globally oriented service storing business critical data, it imposes unforeseen difficulties for application developers who want to take advantage of AD as an application directory: a central storage for application data or personalized configuration.

The difficulties lie in:

**Lack of Global Interest** — the fact is that such application data is very application oriented and only a portion of the enterprise user base will be accessing them, this data has rare global implication or interest therefore placing it in an Enterprise directory may not be acceptable.

**Competing Resources** — application data and personalized data can be highly volatile and frequent updates may generate high replication traffic that could strain network and computational resources if data is housed in an AD.

**Schema Changes** — the proposal for changing the schema is rather common and necessary in order for applications to properly store data in an AD. However, such proposal attracts high levels of scrutiny and often faces negative outcomes due to the sensitive nature of AD.

**Lack of Choice** — application vendors may propose an alternative directory service, but that approach would not be well received as organizations want to standardize on one directory service technology, not diversify them.

As an example, NFS Maestro Gateway and NFS Maestro Server Enterprise Edition communicate with a Name Mapping Server in order to retrieve the correct translation of user and group names from Windows domains to the corresponding identification values, such as UNIX user identification (UID) and group identification (GID) values, in NFS Name Space. The mapping table must be stored in a directory service that is accessible to the NFS user community. LDAP directory service, such as Active Directory, is an ideal mechanism to store and serve such data; however, it may not be feasible for some users due to the concerns mentioned above.

Entering the scene is Active Directory Application Mode (ADAM). ADAM is a new capability in AD that can function as a simple application directory where the application will be able to store data on it without any implication as to the organization's directory infrastructure. The simplicity of it can be attributed to the fact that ADAM is a non-operating system service; it functions as an independent service and it can be installed on any computer, whether the computer is a domain controller is no longer relevant. As an independent service, multiple instances of ADAM can run on a single server and each instance can be configured independently. This is very beneficial during software development or application pilots. Directory-enabled applications can use any ADAM as the application directory and apply necessary schema changes to that instance of ADAM as application developers see fit while still authenticating users against AD.

Name Mapping Server that comes with Connectivity 2008 can take advantage of any Windows machine running ADAM by turning it into an LDAP name mapping server using the Hummingbird ADAM name mapping schema extension script. As mentioned afore, due to the independent nature of ADAM, schema changes will not affect other instances of ADAM or AD. Administrators can even quickly install ADAM on the same machine where Name Mapping Server resides and provide the Server with a local instance of application directory in order to further reduce network resource usage.

## Multiple Directory Services Profiles

### A Directory Service, NFS Maestro Solo and NFS Maestro Client Feature

Active Directory and ADAM promotes deeper proliferation of directory services on every level of an organization. With many LDAP directory services available in an organization, each configured for a particular group of users or customized for particular applications, it is unreasonable to ask an administrator to elect one, and only one, LDAP directory service to be THE directory service for handling all tasks related to NFS authentication, yellow page accesses, etc. Obviously, organizations

that have deployed multiple NIS or NIS+ servers also face similar limitations which need to be addressed.

In the 2008 version, Hummingbird introduced the concept of Hummingbird Directory Services Profile. The idea is simple; administrators or users can now create up to ten directory services profiles for each directory service type: NIS, NIS+, LDAP and HCLNFSD/PCNFSD. Each profile can have different attributes, such as different host, server or domain names. For LDAP profiles, each can be pointing to different type of LDAP servers with radically different LDAP schemas and authentication methods.

When establishing an NFS connection, users can load one of the pre-defined directory profiles based on the types of NFS resources that are being accessed and the security requirements established. In the end, each NFS connection can be customized to authenticate against the most appropriate directory services, and in addition to that, users can specify the authentication type that is required. The multiple directory profiles feature is supported by Hummingbird Directory Services, NFS Maestro Solo and NFS Maestro Client.

## Intelligent Name Mapping Cache

### A Name Mapping Server Feature

The main function of a Name Mapping Server is, as implied by its name, maps names. It maps user and group names from Windows domains to the corresponding identification values, such as UNIX user identification (UID) and group identification (GID) values, in NFS Name Space. Users can only access the shared resources if their Windows credentials can be successfully translated, or mapped to equivalent UNIX credentials. This mapping table is rebuilt and validated every time the Name Mapping Server restarts in order to ensure its authenticity. Once the mapping is completed, the results will then be stored internally in a native Hummingbird database, or an LDAP directory service if NFS Maestro Server Enterprise Edition is installed.

In a small to medium organization, the mapping table may be relatively small so that the time it takes for it to be rebuilt is minimal leaving no effect on the overall usability of the Name Mapping Server. However, for organizations that have tens of thousands of mappings, this rebuilding process can be much longer, in some extreme cases this rebuild can take hours. Such long delays may affect productivity as no valid mapping data can be provided during the rebuild process, and without proper credentials users will not be able to access the necessary resources.

Intelligent Name Mapping Cache is designed to remedy the situation. Each time name mappings are successfully created, the results are cached on the local disk. During the mapping table rebuild process, which is normally caused by a server restart, all name mapping requests are redirected to the cached mapping until the

rebuild process is completed successfully. With this enhancement, there will be no loss in productivity as mapping data is always available.

*Figure 3  
Cached mapping table is used during the process of rebuild. This enhance usability and productivity of the Name Mapping Server*



## Symbolic Link Creation over NFSv4 Connections

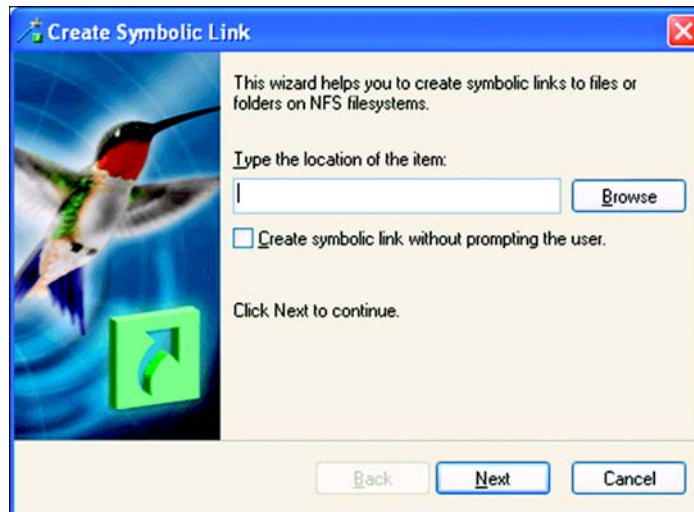
### An NFS Maestro Client and Solo Feature

Both the command-line application and the Create Symbolic Link Wizard now allow users to create symbolic links on all NFS mounts, including NFS connections that use NFSv4.

The `ln` command is one of the most commonly used commands by UNIX users whenever they need to create a “shortcut” to a resource. The `ln` command found in NFS Maestro mirrors the functionalities of its UNIX counterpart; it creates a symbolic link that references a resource residing on an NFS file system by its path name in the Microsoft Windows environment.

Users who prefer a graphical interface over the command line utility will find the shell extension an invaluable tool. It is a wizard-based application that guides users to create a symbolic link on any local drive that is connected to an NFS file system directly from Windows Explorer.

Figure 4  
Using the Symbolic Link  
Wizard to create symbolic  
links



## Support for Multiple Instances of Gateway Shares

### An NFS Maestro Gateway 2007 Feature

NFS Maestro Gateway is the only product in the NFS Maestro family that remains as a version 2007 product.

As a middle-man between Windows SMB network and UNIX NFS network, NFS Maestro Gateway makes a lot of complexities surrounding NFS disappear. Users believe they are accessing Windows' resources, when in actuality it is NFS resources that they are tapping onto. In order to maintain this illusion, NFS Maestro Gateway must imitate Microsoft Windows behavior to the fullest, especially in areas related to sharing so that users can continue to work in a familiar environment.

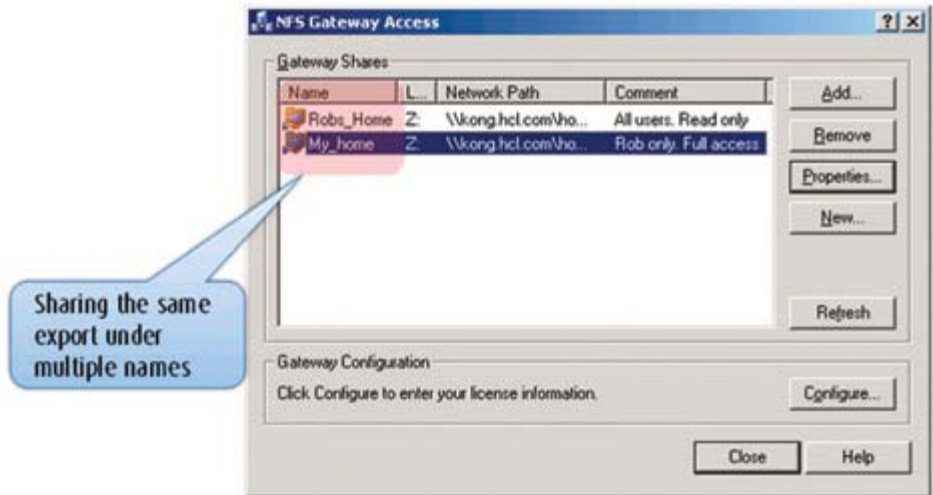
The ability to share information in a business environment has been a vital functionality of Microsoft operating systems. After many years and many versions, the technologies behind sharing have vastly improved, but the idea is always the same - allowing the right users to access the right information securely and efficiently.

The business benefits of allowing users to share data are as trivial as they are essential. In a Windows environment, a user can share his windows resource multiple times, and each time, the shared resource will assume a different name and can be made available to a different group of users with a different set of permissions; all can be done at the user's discretion.

Now, NFS Maestro Gateway 2007 gives administrators the option to create multiple Windows SMB shares for each NFS connection, just like sharing is done in the Windows world. Once a Gateway share is established, just click on New... and the administrator can share the same NFS source again as an SMB share. Each SMB

share will be identified by a unique share name, and a unique set of permissions can be given to different users.

Figure 5  
Just Click on New... and administrators can share the same NFS resource in the SMB environment multiple times



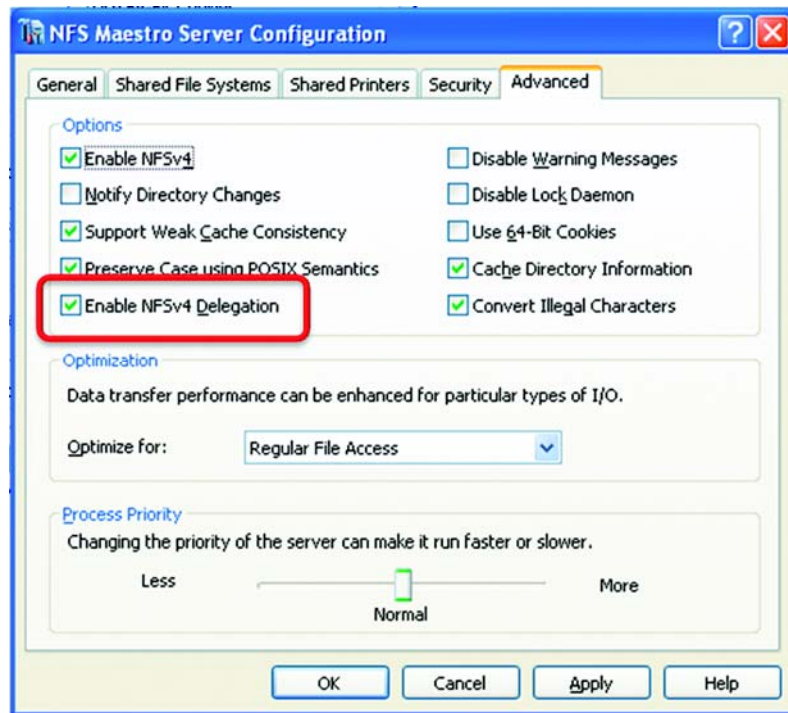
## New NFSv4 Features

### An NFS Maestro Server Enterprise Edition Feature

The support for two additional NFSv4 features is included in NFS Maestro Server 2008 Enterprise Edition:

**Delegation** — delegation is a performance enhancing feature that deals with advanced client caching. An NFS client often maintains cached data of file, attribute and directory of NFS shared resources on an NFS server, and it will periodically contact the server to validate cached data to ensure consistency. However, with frequent communication between multiple clients and the server can degrade the server's performance and generate high volume of network traffic. Delegation is introduced in NFSv4 as one of the methods to speed up NFS. It allows NFS server to delegate the responsibility of handling file open, close and locking operations to clients. NFS clients will be able to cache data more aggressively and eliminates the need for the client to contact the server. It lightens the server's work load, reducing over-the-wire network traffic and the latency associate with it.

Figure 6  
Delegation is one of NFSv4 features. The NFSv4 option must be selected before you can enable Delegation



Delegation is strictly an NFSv4 feature, only NFS clients that support NFSv4 and delegation will be able to enjoy these benefits.

**SECINFO** — SECINFO is a mechanism that allows an NFS client to discover what security flavor is required in order to successfully connect to a shared file system on a remote NFS server. The support for SECINFO is important because administrators must be able to specify a list of preferred authentication protocols for each shared NFS resource based on business and security requirements, otherwise all the efforts and benefits of providing various security mechanism will be lost.

NFS Maestro Server 2008 Enterprise Edition gives exactly what administrators are asking for: a shared NFS directory with their own set of permitted authentication flavors. Administrators can choose from a list of authentication protocols: AUTH\_NONE, AUTH\_SYS, AUTH\_DH, and RPCSEC\_GSS. The RPCSEC\_GSS security mechanism allows further customization: the GSS-API mechanism, the quality of protection, and whether to use authentication, integrity, or privacy service.

However, do note that the SECINFO operation is only needed when the client attempts access with the wrong security flavor and an associated NFSv4 error is returned.

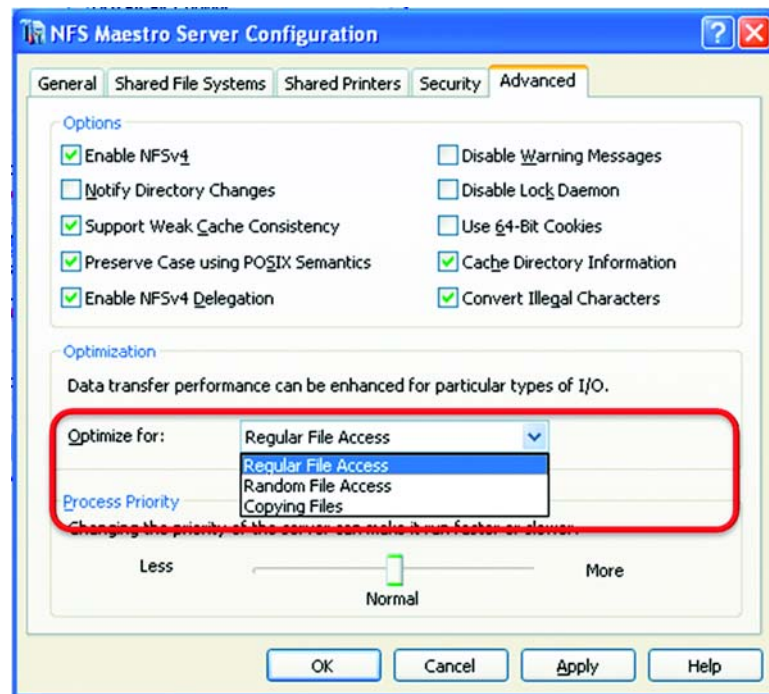
## Optimized Data Transfer

### An NFS Maestro Server Enterprise Edition Feature

NFS server exports file systems to users and applications on NFS-enabled hosts for various reasons. The complexity of optimizing the performance of NFS server lies in the usage of the shared resources. Different usage patterns demand special optimization in order for the software to yield the best efficiency and performance. Is the shared resource a target or destination for data backup or replication, which high volume of data will be accessed in a sequential manner? Or is it a work directory for users or applications where project files will be randomly withdrawn or deposit on-demand? If so, what is the frequency? Some users or applications will withdraw project files at the start of a work shift and deposit them back when the shift ends. However, if it is a database application that is accessing an NFS source then thousands of transaction can occur within a day, an hour, or even a minute.

NFS Maestro Server Enterprise Edition offers adjustable performance settings that are optimized for different types of input and output operation: Regular File Access, Random File Access and Copying Files. Administrators should choose the performance setting that is best when describing the data transfer pattern.

*Figure 7  
Choose the type of input and output operation that best describes your usage of NFS Maestro Server Enterprise Edition for optimal performance.*



## Customizable Mount Paths

### An NFS Maestro Server Enterprise Edition Feature

When a PC NFS server exports a file system, it will assign the mount path as the UNIX equivalent of the name specified in the Shared Directory box. However in some cases, that UNIX equivalent name can get very untidy. For instance, if a user were to export:

```
C:\Documents and Settings\All Users\Documents\My Pictures\Pictures Upload
```

To the world as a public folder, the UNIX equivalent name would then be:

```
/C/Documents and Settings/All Users/Documents/My Pictures/Pictures Upload
```

Imagine typing this share name along with many parameters on a UNIX console as part of the mount command, it can really make someone with a decent typing skill wince. The confusion and complication will only multiply if there are many exports with such elaborate names.

Aliased mount path is the answer to this dilemma. NFS Maestro Server Enterprise Edition offers users the ability to easily edit the export path to have a short and concise reflection of the share. In our case, the mount path can simply be:

```
/Upload_Pics
```

*Figure 8  
You can give your NFS share a name that is self-explanatory and easy to memory or type by your users.*



## SETGID Option

### An NFS Maestro Server Enterprise Edition Feature

NFS Maestro supports SetGID and the option can be found in the NFS Properties dialog box and the chmod command line utility.

SetGID is a UNIX concept. If a program has the set-group-id bit set, then when any user runs the program it will be run with all the access privileges of the group of the program rather than that of the user. The benefit is that instead of permanently assigning extra privileges to users to meet the requirements of the program, SetGID can temporarily raise the user privileges to match the ones required by the program.

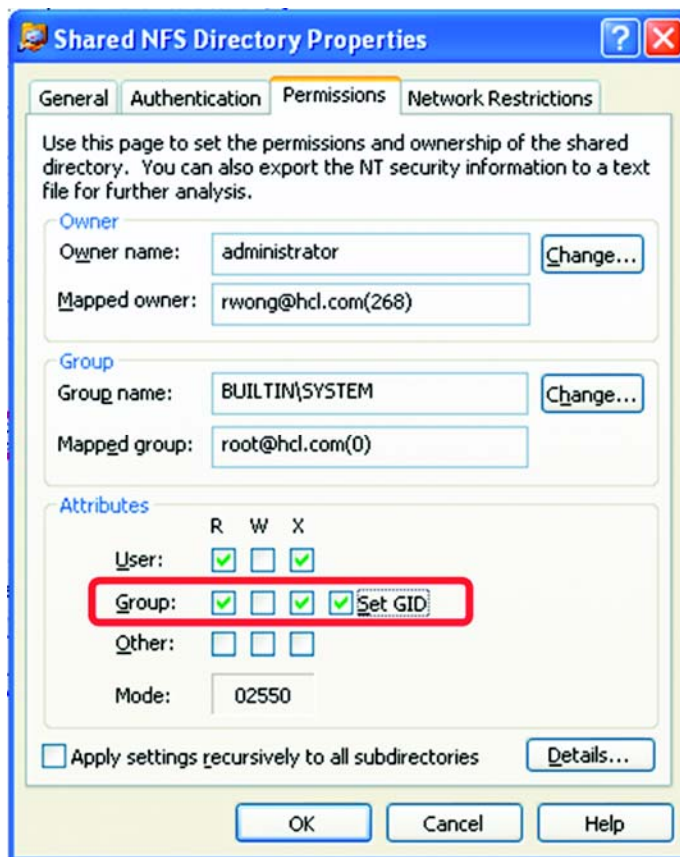


Figure 9  
Setting the SetGID flag in  
the NFS Maestro Server  
console to elevate your  
users access right

## Other Server-related Features

### NFS Maestro Server Enterprise Edition Features

**Support Sharing Folders on Volumes without Drive Letters** — NFS Maestro Server Enterprise Edition allows users to export file systems residing on volumes that have not been assigned drive letters by the operating system.

**Improved User Interface for NFS Maestro Server Console** — the NFS Maestro Server Console has been revised to include a new “Security” page that houses all existing and new security related options, including security service providers

**Support for Timeout Value for Volume Shadow Copies Cache** — Volume Shadow Copies can be understood as a tool that creates an online snapshot of the shared folders periodically or on demand to facilitate instant data recovery or, the recycle bin for network resources. NFS clients will be able to browse a folder exported by NFS Maestro Server Enterprise Edition and access the snapshots, the backed up data, of that folder if available. A timeout value is now in place in version 2008 that specifies the amount of time in seconds the server waits before refreshing the cache used to store Volume Shadow Copies.

**Support for Kerberos on Microsoft Cluster Environment** — when an NFS client accesses resources shared by NFS Maestro Server Enterprise Edition running on a Microsoft Cluster environment, the client can authenticate the user using RPCSEC\_GSS security mechanism.



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