Administring NFSv4 with Webmin

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1 Introduction to Webmin

Webmin is a web-based interface for system administration on Unix-like operating systems. Using any browser that supports tables and forms (and Java for the File Manager module), Webmin can be used to setup user accounts, Apache, DNS, file sharing and so on.

Webmin installation and configuration is really quick and easy (a Web server is included, no need for an external one). Interface is also simple and friendly, making it an ideal tool for any administrator willing to configure Unix-like machines without getting lost in the bunch of commands.

http://www.webmin.com

2 Manage exported directories

Webmin provides a module to manage NFSv4 (and v2,v3) exports. We give here a study on what is already handled and what should be added.

First, one can see the list of exported file systems along with their properties. Changes can be made on any export and one can add or remove NFS exports.

2.1 Available features

A large amount of export properties and options are supported. This is an exhaustive list :

- NFS version (3 or 4)

- File system

    ○ Pseudo file-system to export (NFSv4 only, *fsid=0*)
    ○ Directory to export
    ○ Where to export the directory under NFS root (NFSv4 only)

- Security flavors

    ○ SYS

        – Everyone
        – Hosts
        – Web NFS client (not enabled on GNU/Linux)
        – IPv4 network

    ○ Kerberos 5 (with selection of option : none-integrity-privacy)

- Export options

    ○ Read only / Read-write (*rw/ro*)
    ○ Client must be on secure port (default) or not (*secure/insecure*).
    ○ Subtree checking (*subtree_check/no_subtree_check*)
    ○ Hide the file system (*hide/nohide*)
    ○ Immediately synchronize all writes or not or default (*sync/nosync*)
    ○ Trust every remote user (*insecure,no_root_squash*)
    ○ Trust every remote user except root (*insecure*)
    ○ Do not trust any remote user (*insecure,all_squash*)
    ○ Manually set *uid* of the anonymous account (*anoid=value*)
    ○ Manually set *gid* of the anonymous group (*anogid=value*)

2.2   What should be done

Webmin NFSv4 module contains some bugs :

- There is a problem to distinguish between NFSv.3 and v.4 exports and thus all entries - except the virtual root - are seen as v.3 exports. Nothing in `/etc/exports` syntax can be used to detect NFSv4 exports. Therefore, I propose to display all exports as NFSv4's as soon as `nfsd` version 4 is running on the system. Else, they will be marked as NFSv3 exports.

- Pseudo file system selection works only for default directory (`/exports`), else there is a javascript issue. We need to solve it.

- Selection of where to export the directory under NFSv4 root is not correctly prefilled (can prevent from using this function in certain cases)

There also are some things that need to be changed or enhanced regarding current NFSv4 implementation :

- Security flavors selection need to be entirely re-designed. First, hosts selection must applied to any flavor (not only SYS). An **ordered** list of security flavors should also be given (for security negotiation) instead of a single one.

- Support for future security flavors has to be handled. For the time being, only the graphical interface has been designed. We have to support SPKM-3 and LIPKEY.

- Host selection does not allow to specify several hostnames. It would be better not to select again all export options for each hostname the entry applies to.

- Host selection has to support NIS names and IPv6 addresses. They exist in the GUI but they are not used in the code.

- "World" host selection (export to anyone) does not write a '`*`' before the ' ('.

- Export options entitled "Synchronize all writes" has to be changed to remove selection of default which is confusing : old versions of `exportfs` were using *async* as default and now it is *sync*. Moreover, a warning is raised by `exportfs` if *sync* mode is not explicitly given.

- Syntax used to write to `/etc/exports` is correct. But the one used to read from `/etc/exports` is not complete : one can write entries which are understood by `nfsd` while not being readable by Webmin.

- Some export options presented in our paper "NFSv4 administration" are not supported. We will see if we need to add them.

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3 Mount file systems

Webmin provides a module to mount NFSv4 (and v2,v3) file systems. Likewise exports, we give here what is already supported and what should be added.

In the mount module, one can see the list of mounted file systems, one can get and set their associated properties and mount/unmount a file system. When doing a mount, one can specify if it has to be mounted at each startup.

Analysis has only been done for NFSv4 since Webmin provide two NFS modules : one dedicated to NFSv4 and one for older versions (2,3).

3.1 Available features

Mandatory properties for each mount are :

- NFS server address (name or IPv4 address)
- NFS remote directory to mount ('/' to mount the pseudo file system)
- Local mount point

Supported common mount options are :

- Read-only or read-write (*ro/rw*)
- File system I/O are done synchronously or asynchronously (*sync/async*)
- Allow device files (*dev/nodev*)
- Allow execution of binaries (*exec/noexec*)
- Allow usage of setuid bit for program (*suid/nosuid*)
- Allow an ordinary (non-root) user to mount the file system (*user/nouser*)

Supported NFS specific mount options are :

- Specify NFS port or use port mapper (*port*)
- Retry mount in background if the first one timeouts (*bg/fg*)
- Return error to program when an operation has a major timeout (*soft/hard*)
- Set timeout before first retransmissions (then, double up to 60s) (*timeo* (default=0.7s))
- Set number of retransmission (trigger major timeout) (*restrans* (default=3))
- Allow user to interrupt (via signal) after major timeout (*intr/nointr*)
- Set read and write buffers size (*rsize*, *wsize* (default=32768))

3.2 What should be done

- Add support for no automount option (*noauto*, `mount -a` will not mount the file system)

- Add option to set cache timer (for regular file and directories) (*acregmin, acregmax, acdirmin, acdirmax*) if it turns out to be useful in NFSv4.

- Add option for number of minutes to retry a mount before giving up (*retry* (default=1 week!))

- Add option to disable all forms of attributes caching (*noac*). I am not sure this is still useful with NFSv4 (attribute are sent at each request ?)

- Remove the choice between port mapper and a well-defined port since NFSv4 does not use the port mapper anymore (but we keep the choice of NFSv4 port which is not necessarily 2049).

4 GUI and help

Some changes should be done in the GUI to clearly highlight which properties and options need to be set and which ones are only for advanced users willing to tune NFSv4 behaviour. For instance, WSM on AIX (a graphical administration tool) provides two interface levels : a **wizard** prompting only for basic arguments and an **advanced mode** to configure mounts and exports in details.

Some help dialogs are missing or are not really understandable - they do not tell more than the man pages. We will provide missing dialogs and make them translated in different languages. We will also try to improve the existing help so that one can understand when the option should be used.

5 Conclusion

Actual module covers main NFSv4 features but it needs to be fixed and enhanced to deal with the actual state of NFSv4 GNU/Linux implementation. Comments about what could be improved in Webmin's NFS modules are welcome !