

*open-e*

Open-E NAS  
ENTERPRISE

Manual (Ver. 1.88)  
May 19, 2006

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# 1 Before you get started

Congratulations on purchasing Open-E NAS ENTERPRISE, the ideal solution for network-based storage management. This manual will assist you as you install and configure the hardware.

In order to quickly reach the desired configuration, please read the following pages thoroughly. The time invested is well spent - after all, you have purchased this solution for your invaluable data.

## 1.1 Content of this package

Before you begin installing Open-E NAS ENTERPRISE, make sure that the package contains the following items:

- Open-E NAS flash module,
- Power adapter,
- Quick Start brochure,
- A CD containing the manual (this document), brochures, images and additional information material,
- Source CD.

If something is, indeed, missing, please contact your dealer.

## 1.2 System requirements

- x86-compatible PC (Pentium IV),
- at least 256 MB main memory,
- Hardware RAID Controller,
- IDE port
- One or several suitable hard drives,
- Network Interface Card (NIC).

Open-E NAS ENTERPRISE contains its own operating system, meaning that no additional software is required.



***Note: In order to generate maximum performance, we recommend using a network card with 100 MBit/s or more, as well as a processor with at least 1,4 GHz. If several computers are accessing the NAS system, we recommend 512 MB main memory or more.***

## 1.3 Supported clients

- Microsoft Windows (all versions)
- Linux
- Mac OS 8.0, 9.0 and OS X

## 1.4 Supported network protocols

- TCP/IP
- NetBEUI
- SNMP

## 1.5 Supported network file protocols

- SMB / CIFS / Samba
- Apple Talk
- FTP/sFTP

## 1.6 Required tools

- Grounding strap or mat in order to avoid electrostatic discharge (ESD)
- Tools for opening the computer's enclosure (typically, a screwdriver)

## 1.7 Safety precautions

### 1.7.1 Personal safety



**Caution:** *High voltages may occur inside computer equipment. Before removing the enclosure, please turn off the power switch and disconnect the power cords.*

### 1.7.2 Safety for your data

If you are not using new hard drives for operating Open-E NAS, please backup all important data prior to installation. Adding a hard drive to Open-E NAS goes hand in hand with complete formatting of the hard drive, which can possibly delete existing data.

### 1.7.3 ESD precautions

In order to avoid damage to your computer or to Open-E NAS, please ensure you are grounded before opening the PC or the ESD package that contains Open-E NAS. Using grounding straps or mats is the best way to ensure this safety. If you don't have grounding equipment handy, please make sure you are grounded before working with Open-E NAS, for instance, by touching a heater.

- Avoid unnecessary touching of the components inside the PC
- Please touch Open-E NAS only on the edges

## 2 Features

### 2.1 What is NAS?

Network Attached Storage (NAS) solutions are defined as storage systems that are directly hooked up to a network infrastructure. Also, they operate independently and do not have to be connected to a server via a controller or host adapter. The term “storage” here generally refers to all systems that either provide data storage or actually store or organize data. Currently, data storage is the most common and most widespread type of NAS systems.

NAS solutions are based on a separate operating system (and often also on special hardware), which operates independently from the servers on a network. Typically, this operating system is software that is optimized for providing data (file server).

NAS solutions allow users to add additional storage to existing networks quickly, easily, and cost-efficiently.

### 2.2 Description of the functions

Open-E NAS is one of the easiest ways of implementing an NAS server in your network. Through its simple architecture – in principal, it is a flash memory with IDE interface and Open-E NAS as its operating system – Open-E NAS can be used with all x86 PCs containing an IDE controller and additional RAID Controller. Older computers may also be used.

To start working with Open-E NAS, all you need to do is assign an IP address to the NAS server – either automatically through an existing DHCP server or by assigning it manually. All other settings are handled via a web front-end which can comfortably be accessed via the IP address of Open-E NAS using the encrypted https protocol.

Open-E NAS allows users to create so-called shares (i.e., resources within a network that numerous users or user groups have certain access too). The access rights to the shares are controlled through the user and user group settings.

## 2.3 Why Open-E NAS?

Often, storage in network environments is expanded the following way: File servers have to be shut down in order to install additional drives. In the next step, they need to be reconfigured. In tedious work, data often has to be copied manually onto larger drives, consuming a lot of time and causing costs.

With Open-E NAS, you can add storage to your existing network quickly, easily, and, most important, cost-efficiently. Expensive hardware is, therefore, no longer necessary. Take any computer – a new rack server or an old desktop PC – and exchange the system drive for the Open-E NAS flash module. To store data, Open-E NAS uses IDE (ATA) and SATA hard drives.

Within a few minutes, you will have up to several hundred gigabytes available on your network – without much effort and any downtime.

## 2.4 RAID types

This manual is not intended to replace your RAID controller manual. But we want to provide you with an overview of common RAID types so that you can make an informed decision on which type to choose. Depending on whom you ask, RAID means either Redundant Array of Independent Disks or Redundant Array of Inexpensive Disks. Both are correct. In essence, you combine the capacity, speed and security of several disks into one.

**RAID 0** forms one large hard disk by concatenating stripes from each member drive. Stripe size is configurable roughly between 64 KB and 1 MB. The result is a lightning-fast RAID, but with no added security. One failing drive may ruin the entire RAID.

**RAID 1** mirrors hard drives. By writing identical data onto more than one drive, security is enhanced. A completely defective drive does not cause any loss of data. The drawback is reduced performance and capacity.

**RAID 5** combines data striping from RAID 0 with parity checking, therefore combining speed and improved security. The loss of one drive is tolerable.

**RAID 10** is a combination of RAID 1 and 0, hence the name. Data is written in a striped and mirrored configuration, providing high performance and robust security.

## 3 Hardware installation

### 3.1 Getting ready

Switch off the computer, remove the power supply, and open the PC's enclosure. In tower cases, the side parts often can be removed individually (on the backside of the enclosure you just need to remove a few screws). Many machines have U- or O-shaped covers that have to be pulled off (either towards the front or the back). Should you need any assistance, please contact your dealer.

Now localize the IDE connectors on your motherboard:

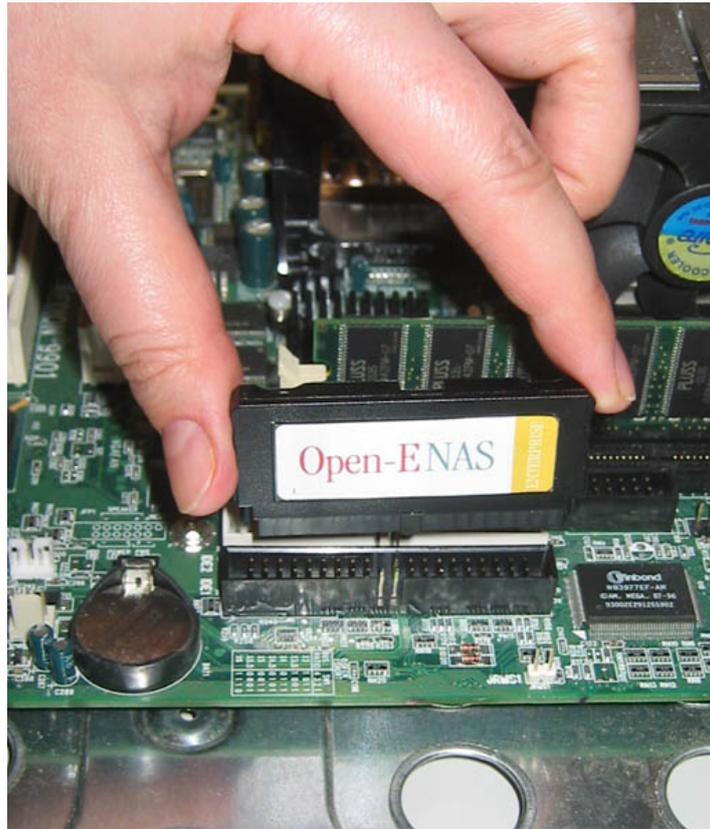


Every motherboard has at least two such ports. To install Open-E NAS, you have to use the first (primary) port.

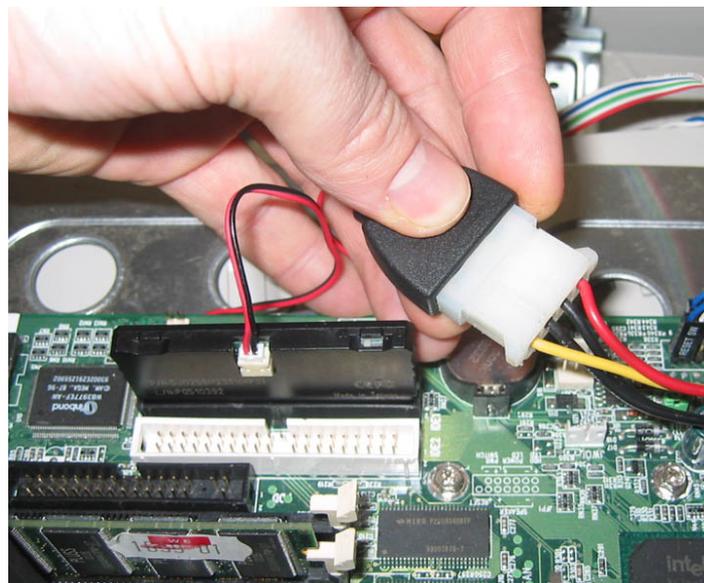
Often, the labeling on the IDE connectors may be tiny, but it is always there, on each and every board. Preferably look for “IDE 0” If this connector does not exist, the first port is called “IDE 1” (with the second connector being 2).

### 3.2 Installing Open-E NAS

If necessary, remove the flat band cable which, so far, connected your hard drive with the controller. Open-E NAS is now carefully inserted into the connector. As IDE ports can have a notch on one side, you can only insert the connector at the preset position.



In the package you will find an adapter cable which provides Open-E NAS with electricity. The little white plug corresponds with the matching connector on Open-E NAS. In a final step, the adapter has to be connected to the white power-supply plug (see photo):



That already concludes the installation! Before putting the enclosure on your computer again, do not forget to connect your hard drives to the RAID controller. If you have a CD or DVD drive, you can remove it, as Open-E NAS does not support optical hard drives, but if you want to make an ISO update it is not necessary to remove the CD drives (see 5.2.3.4).

## 4 Configuration

### 4.1 The basic configuration of the NAS computer

Connect your keyboard and a monitor to the NAS computer. You will only need those devices for the basic or extended maintenance configuration.



**Note:** *You may have to change the function “Halt On: All Errors” in your PC’s BIOS, so that the system starts even without the keyboard. The correct configuration is “Halt On: All But Keyboard.”*

### 4.2 First-time operation of Open-E NAS

Now start your system. After booting is complete, Open-E NAS will provide you with information on the current software version and the network settings:

```
Welcome to Open-E NAS                                     (Press F1 for Help)
-----

Model:           Open-E NAS ENTERPRISE
Version:         1.88.E00000001.1811
Release date:    2006-05-19
S/N:            1357186427

Network settings:
interface 1:     eth0      ip: 192.168.0.220
interface 2:     eth1      ip: 192.168.1.220

Https settings:
                port      443
                allow from all
```

If the network has a DHCP server, Open-E NAS should gain access to the IP settings automatically. If that is the case, you can proceed at 4.3. If your network does not have a DHCP server, Open-E NAS will start with the default settings: IP address 192.168.0.220 and subnet mask 255.255.255.0.

You can change these values again by typing in the following key combination: left CTRL, left ALT and N. You can select a different IP address now. All other available functions on of the console will appear after pressing F1 key (see below).

```
----- Help -----
You can use below key sequences (C-means 'Left Ctrl',A-'Left Alt'):
C-A-N   - to edit static IP addresses
C-A-P   - to restore default factory administrator settings
C-A-I   - to restore default factory IP configuration
C-A-T   - to run console tools
C-A-X   - to display extended tools
C-A-H   - to display hardware and drivers info
F2      - to display all network interface
F5      - to refresh console info
C-A-S   - to shutdown the system
----- (100 %) -----
< EXIT >
```

After a connection has been established, all settings can also be changed remotely via the web browser. If your network require, the address of the standard gateway and the broadcast address can be changed.



**Note:** *For additional information, please read the chapter “Functions of the console display”*

### 4.3 Logging into Open-E NAS ENTERPRISE

You can establish a connection to Open-E NAS from every network computer. To establish this connection, use a browser (e.g. Microsoft Internet Explorer) and enter the IP address or the name of the computer hosting the NAS server into the URL entry line: <https://192.168.0.220> (standard address) or <https://ancom> (this name can be changed in the installation of Open-E NAS).

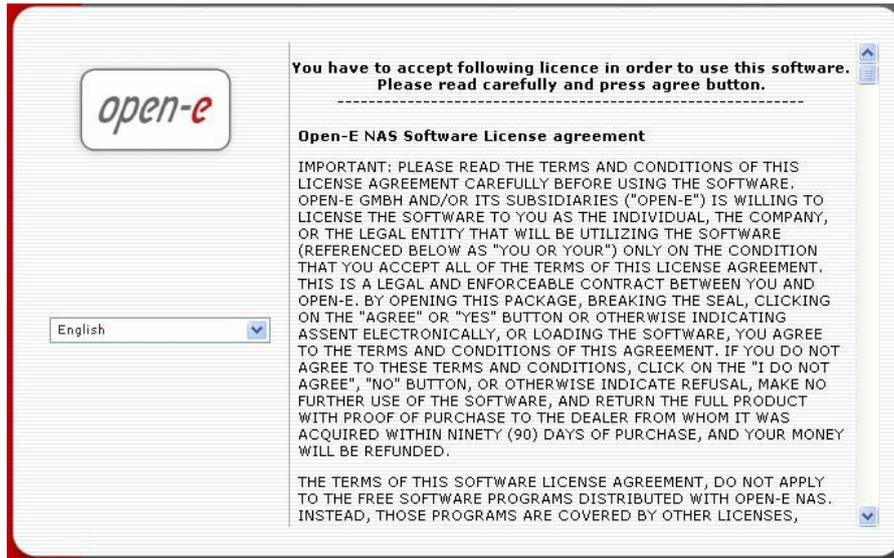


**Notes:** *For security reasons, Open-E NAS uses the encrypted SSL protocol (https).*

You will now be asked for verification of the encryption certification. Since Open-E NAS does not allow for creating shares on the Internet but only on the Intranet, there is no need for global certification by an authorized body. You can accept the certificate for the session only, but also for all future use.

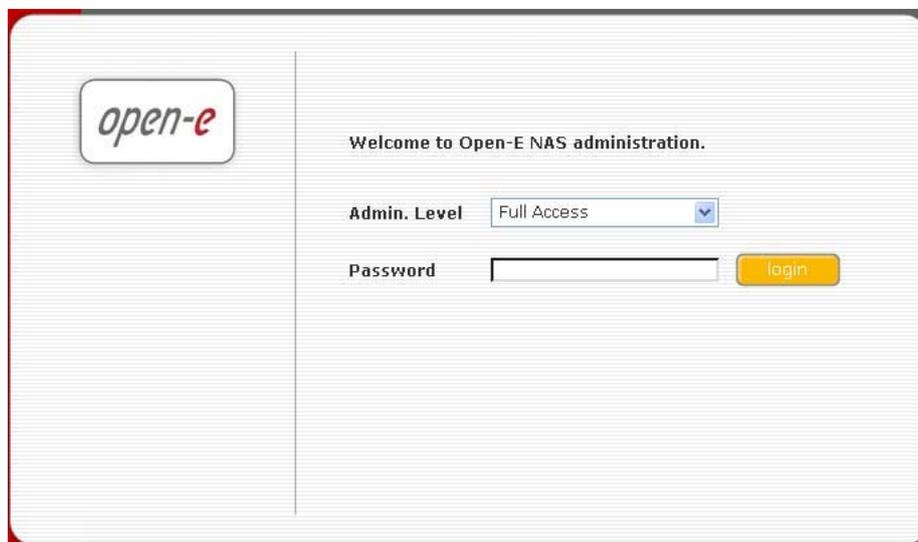
Now you have to accept license in order to use software Open-E NAS and you can choose language.





**Notes:** *Page with software agreement and available language option will be shown after first launching Open-E NAS. Later language you can change using Language Settings, which are located in server available through Setup.*

After accepting License agreement you can log into Open-E NAS using the standard password “ancom” (this can be changed later). In order to start working, you can now set all server parameters.



**Notes:** *Password checking is case-sensitive. If you cannot log into Open-E NAS, please check the status of the Shift and Caps Lock keys.*

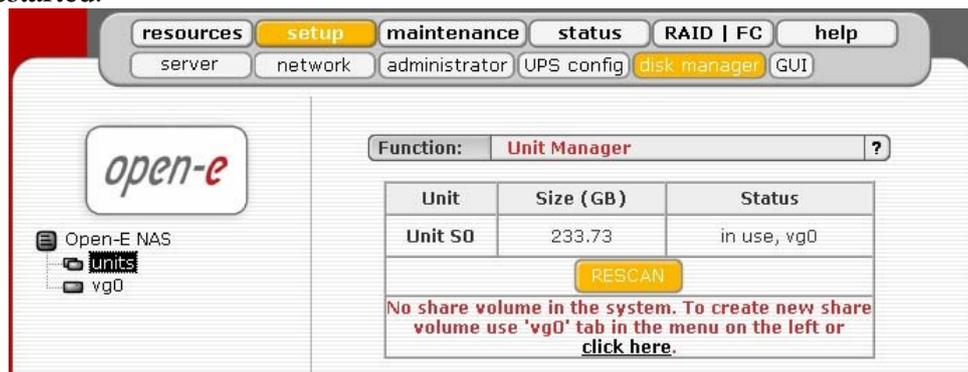


**Notes:** *In case your web browser will show something different then expected, please delete the cache & cookies in settings menu of your web browser.*

## 4.4 Adding RAID-Arrays

Please select “Setup” and then “Disk Manager”. After selecting “Disk Manager” you’ll find a list of all logical units (i.e. RAID array). To add a new unit to the NAS, please click “Add”. After the necessary formatting procedure, the status of the unit will change from the “Add” button into “In use”.

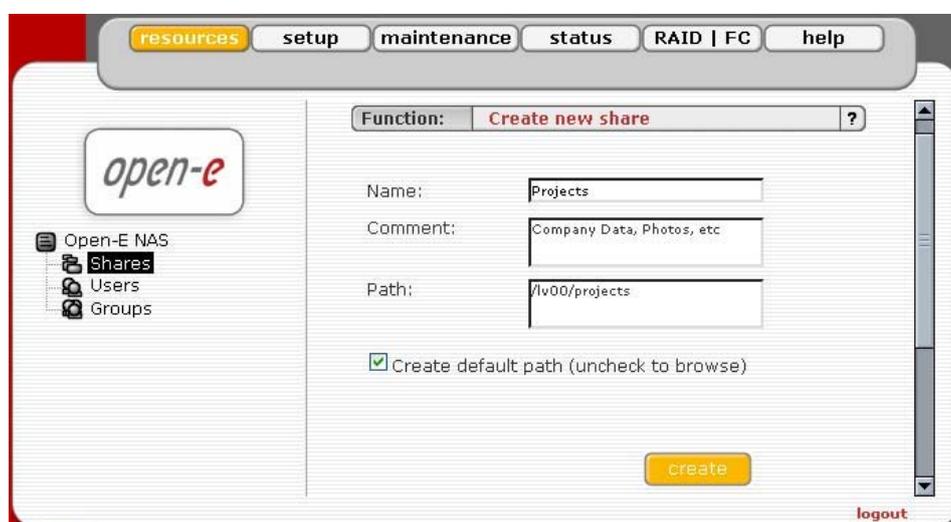
Please note that you can expand the storage capacity by adding new RAID arrays. In the “Unit Manager” Open-E NAS will show both ‘in use’ and new, unformatted units. In order to add a new unit to the Volume Group (vg0), please simply click ‘Add’ after which Open-E NAS page will be restarted.



Next, by clicking on the branch “vg0” you can add disk volume to new LV, or increase size on existing LV’s (you can’t decrease LV size). To set needed LV size just use scrollbar, next to which, on the right side is shown size available to use. This function can be also used to reserve disk space for “snapshots”. Usually for “snapshots” you need about 10% of new Logical Volume.

## 4.5 Creating NAS shares

In the menu, please select “Setup,” followed by “server.” Here, you select the type of authentication. In smaller networks, this should be done via the used workgroup name, which has to correspond with the workgroup name of the client PC.



In the menu “Resources,” select “Shares” on the right-hand side of the tree diagram. Now create the first share.



**Notes:** *The workgroup/domain name that was configured in Open-E NAS has to match with the network settings. Otherwise, the configured shares are not visible in the network environment.*

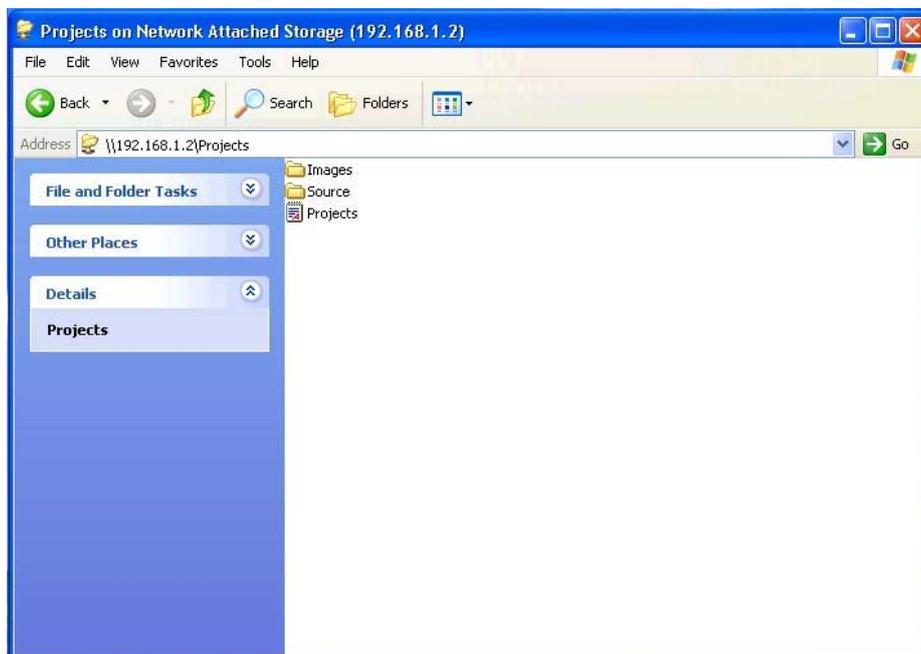


**Notes:** *If you made changes to the workgroup and server name in Open-E NAS configuration, it can take some time until each workstation computer in the Windows network detects the new name.*

#### 4.5.1 Access to Windows Shares

The access to newly created shares is generated via the Windows Explorer. After entering the IP address of your Open-E NAS (in this example \\192.168.1.2), all visible shares should be available immediately. Please keep in mind that sometimes it takes a few minutes for the new shares or changes to become accessible.

When accessing invisible shares, you need to know beforehand the corresponding share name and attach it to the IP address with a backslash (\):



Open-E supports Windows ACL (Access Control List) for read, write and execute options, but based on the POSIX standard written by SGI.

Some examples how to use ACL (with ADS or PDC authentication):

1. Deny access to a Directory for every user (group):
  - a. Create a new folder or select one of your existing folders (you must be the owner or superuser to set ACL permissions)\*
  - b. Go to the “directory properties” (right mouse click on the directory then choose "Properties")
  - c. Select a the “security” tab
  - d. Choose the group "Everyone"
  - e. Click the "Remove" button – only you and your group will have access to the selected directory \*\*
  - f. Click the "Apply" button

Now only you have permissions to access this directory.
  
2. Allow full access for a group "WORK" to this Directory:
  - a. Make sure that the group WORK is created
  - b. In the security window click the "Add" button
  - c. Click the "Remove" button (point 1)
  - d. Select the group "WORK" (Advanced->Find Now will show you all users and groups) and click OK
  - e. Enable Full Control in the “Allow” column
  - f. Click the "Apply" button
  
3. Set “read only” permissions to the file for everyone:
  - a. Create a new file (you must be the owner or superuser to set permissions)\*
  - b. Go to the permissions window
  - c. Select the “Everyone” group
  - d. Leave only a ”read” permission in "Allow" column
  - e. Click the "Apply" button
  - f. Make the same for your group and yourself

Now the group “Everyone” has "read only" permissions to this file.
  
4. Changing the directory owner:
  - a. On Open-E web interface go to resources->shares
  - b. In the "Set Superuser" function select your user and restart connection (maintenance ->shutdown->Function Connections reset) or wait about 15 minutes
  - c. Go to the directory/file properties (right mouse click->properties on the directory and click the "security" tab)
  - d. Click the "Advanced" button
  - e. Select the Owner tab
  - f. Click the "Other Users or Group" button and select the user that will be a new owner (Advanced->Find Now will show all users and groups), click OK\*\*\*
  - g. Select the user from the list and click OK and the "Apply" button
  - h. Click OK and re-open this window to refresh owner.
  
5. Allow a full access for the user "BIG BOSS" to this Directory
  - a. Make sure that the "BIG BOSS" exists

- b. In the security window click the "Add" button
  - c. Select the user "BIG BOSS" (Advanced->Find Now will show you all users and groups) and click OK
  - d. Enable Full Control in the Allow column
  - e. Click the "Apply" button
6. Allow "read" access for a group "COMPANY" to this directory
- a. Make sure that the group "COMPANY" exists
  - b. In security window click the "Add" button
  - c. Select the group "COMPANY" (Advanced->Find Now will show you all users and groups) and click OK
  - d. Enable "Read & Execute" in the Allow column
  - e. Click the "Apply" button
7. Make "read only" directory with a full access subdirectories for the group "ALL" (using inheriting permissions)
- a. Create a folder "ROOT"
  - b. Go to the security window
  - c. Remove both "Everyone" and "Your" group
  - d. Click the "Advanced" button and then the "Add" button
  - e. Select the "ALL" group and click OK
  - f. Change "Apply onto" to "This folder only"
  - g. In permissions leave only "Traverse Folder / Execute File" and "List Folder / Read Data". Click OK
  - h. Click once again the "Add" button and add ALL group
  - i. This time select "Apply onto" to "Subfolders and files only" (this step will submit any inherited permissions)
  - j. Select "Full Control" and OK
  - k. Click "Apply" to save permissions.

With these settings users from the group "ALL" cannot remove the "ROOT" folder or make any changes to its contents. All new files/folders will be created based on the access given by inherited permissions.

Example:

- file /ROOT/some\_file.txt can be changed but can not be removed
- directory /ROOT/directory can not be removed but a users from the group ALL can create folders and files in this directory.
- file /ROOT/directory/my\_file.txt can by removed and changed by the group ALL (if inherited permissions wasn't changed)

## 8. Inherited permissions

If the file or directory has inherited permissions, all newly created subfolders will inherit the main folder permissions. All permissions can be changed. Please keep in mind that changing permissions in the main folder will trigger the same changes to the inherited permissions of any subfolder within.

9. UNIX Rights in Windows:  
Folders permissions

Permissions	--x	r--	-w-	r-x	rw-	-wx	rwX
Traverse Folder / Execute File	√			√		√	√
List Folder / Read Data		√		√	√		√
Read Attributes	√	√		√	√	√	√
Read Extended Attributes		√		√	√		√
Create Files / Write Data			√		√	√	√
Create Folders / Append Data			√		√	√	√
Write Attributes			√		√	√	√
Write Extended Attributes			√		√	√	√
Delete Subfolders and Files							√
Delete							√
Read Permissions	√	√	√	√	√	√	√
Change Permissions							√
Take Ownership							√

10. Example application of ACL permission in a small company.

The company has 10 users

Name	Group	Position	Rights
Chris	Firma	Director	All rights for everything
Robert	Firma	Manager	All rights for everything besides Directors home directory
Jennifer	Firma	Secretary	Read access to "DOCUMENTS" directory
Clint	Firma Developers	Main Developer	Read and write to "DEVELOPERS" directory read and write to "CHANGES" directory
Brad	Firma Developers	Developer	Read in „DEVELOPERS“ Read and write in „Changes“
Johnny	Firma Developers	Developer	Read in „DEVELOPERS“ Read and write in „Changes“
Tom	Firma Developers	Developer	Read in „DEVELOPERS“ Read and write in „Changes“
John	Firma Graphics	Graphic Designer	Read in „GRAPHICS“ Read and write in „Changes“
Ben	Firma Graphics	Graphic Designer	Read in „GRAPHICS“ Read and write in „Changes“
Bill	Firma	Cleaner	Only access to his home directory

First create users and groups in Your Domain:

- a) Run Menu Start->Programs->Administrative Tools->Active Directory Users and Computers
- b) Right mouse click on your domain name and select New->User
- c) Enter all necessary fields to create user Chris.
- d) Create all users (back to point 2).
- e) Click with right mouse click on your domain name and select New->Group
- f) Create groups: Developers, Graphics, and Company.
- g) Add users to groups - right mouse click on group Developers. In Members tab click Add. Add users to groups (groups Company, Developers, Graphics)

Connection to windows domain:

- a) Go to Open-E NAS Web interface setup->server
- b) Select ADS or PDC (depends on your system - if you have NT4 Domain or Windows 2003 (with no Kerberos\*\*\*\* fix) then select PDC, else select ADS).
- c) Enter your domain name - in PDC this will be the number IP and administrator password in ADS enter the full domain name (example. COMPANY.COM.DE).
- d) Enter your domain/Kerberos server IP
- e) Enter the name and password of an existing Administrator user account on your domain.
- f) Click the "Apply" button to join the domain.

Creation of shares and set permissions:

- a) Create a Company share (Open-E NAS web interface->Resources->Shares).
- b) Set permissions for all or select only Company groups.
- c) Go to share \\YOUR\_NAS\_SERVER\_NAME\\Company
- d) Create folders "WORK", "HOME" and "FORALL".
- e) Set permissions for the folder WORK - right mouse click ->properties->security.
- f) Deny access for everyone (point 1), change the owner to Chris user (point 4) with a full access and add Robert with a full access.
- g) In the folder WORK create folders DEVELOPER, GRAPHIC, DOCUMENTS and CHANGES.
- h) Change the owner of the DEVELOPER directory to Clint (with full rights). Add group Developers with a "read only" access.
- i) Add group Graphics with a full access to the directory GRAPHIC.
- j) Change the owner of the CHANGES directory to Clint (with full rights). Add groups Graphics and Developers with full rights.
- k) Add a secretary to the DOCUMENTS directory with a "read only" access.
- l) In the home directory create own private directory for each user, change user (make that the owner and the directory name are the same). Remove an access for the Company group (point 1).
- m) Add the group Company with a full access to the directory "FOR ALL".

- \* If you use the SUPERUSER all files and directories will be created as a local ROOT user.
- \*\* New directories with no inherited permissions do not have ACL permissions at the beginning - they have only standard UNIX permissions 0777 (Windows 2003 shows - in a normal view in the security window - every special permission. Windows 2000 does not show any permission in normal view - only in the advanced view). To enable ACL for this directory, first select "Full Access" for everyone and click the "Apply" button. Subsequently do the same for your group and your user. Subdirectories created in this directory should have ACL permissions inherited from the parent. If permissions are inherited then the "ALLOW" column is grey. To disable permission just use the "Deny" column.  
If you change ACL permissions always check that a new set of permissions for one group does not interfere with permissions for the other user/groups or any connections between these accounts. Windows 2003 handles much better such changes than Windows 2000.
- \*\*\* This function is available in Windows 2003 - in other Windows versions only your user can be selected.
- \*\*\*\* Kerberos is a server for distributing security keys. Normally it is only on the domain but it can be on some external server. In Windows 2003 this server is ignoring specified key types, and authorization works only when entering IP not the NAS name.

#### 4.5.2 Access NAS Shares under Linux

Please use following line to mount an NFS share:

```
mount -t nfs 192.168.0.220:/nfs /mnt/nfs
```

where 192.168.0.220 is the Open-E NAS IP and /mnt/nfs your local mount point

Please use following line to mount an SMB share:

In a shell:

```
mount -t smbfs -o username=root,password=12345 //192.168.0.220/test /mnt-smb
```

where 'test' is the share name

In X-windows: Smb://root@192.168.0.220/

## 5 Description of functions

### 5.1 Functions of the console display

While Open-E NAS can be fully administered remotely through a secure Web interface, but some of the functions you can also on the console. Open-E NAS constantly displays following basic parameters:

- IP address
- Https settings

#### CTRL+ALT+n

If you press the left CTRL key + the left ALT key + n, you will be asked for the new IP address and the subnet mask. The DHCP server will be shut down.

#### CTRL+ALT+p

If you press the left CTRL key + the left ALT key + p, the access restrictions are lifted by entering the administrator password (in addition, there is a reset to the standard https port 443).

#### CTRL+ALT+i

By pressing a combination of left CTRL key, left ALT key and i, you can reset the original IP address (192.168.0.220) and the subnet settings (255.255.255.0). In this process, the DHCP server support is turned on.

#### CTRL+ALT+t

By pressing a combination of left CTRL key, left ALT key and t, you can run Console Tools. The menu will appear, with choice of following functions: Ping, DHCP Ping, Hardware info, Memory info, Time configuration and DNS configuration.

#### CTRL+ALT+h

By pressing the left CTRL key, left ALT key and h, it will display hardware and driver information.

#### CTRL+ALT+x

By pressing the left CTRL key, left ALT key and x, it will display extended tools.

#### F1, F2 and F5

Function key F1 is available to display help information while F5 will reset the console display to default. If you press F2 key all network interface will be displayed.

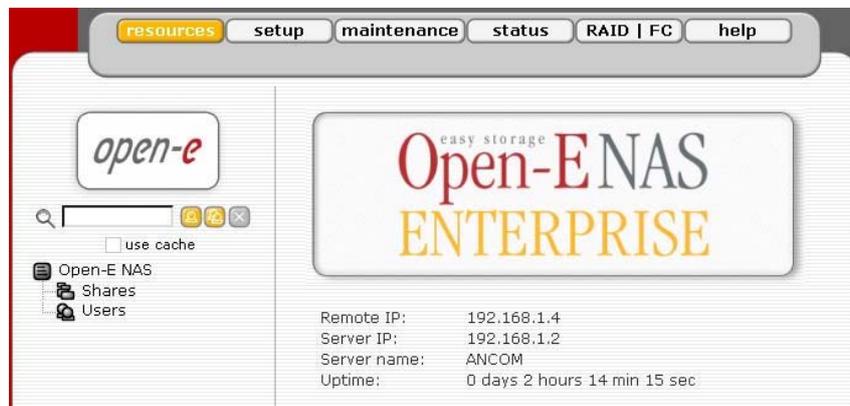
#### Shutting down and restarting

With Ctrl + ALT + DEL the Open-E NAS host computer will be shut down and restart, while CTRL + ALT + S shut it down. Please be careful with this option when users are connected.

## 5.2 Functions of Open-E NAS via browser access

On the following pages, we will thoroughly describe every function of Open-E NAS. The functions are divided by menu options, which are located at the top part of the screen.

### 5.2.1 Menu “Resources”



Here, you can find important data status (IPs, server name, uptime), and you can configure NAS operations. All that may be accomplished by using tree diagrams on the left side. This will help you manage all shares, users, user groups in a structured manner and in addition control search.

The search control can be enabled in the Open-E NAS menu->setup->GUI in the Search preferences Function.

The search control allows to lookup users or groups in the remote or local user database that NAS server is currently attached to. To apply a criterion put a string into the 'search' textbox and click on the play button. All found entries, containing the search string typed-in, would be listed. Note that the first time you use the search facility, your query will be sent back to the server for processing. All the subsequent searches will access only the locally cached data to save the time. To query the database directly again, set out the 'use cache' checkbox.

You can use regular expressions to look for users, for example:

- to lookup users' ID beginning with the word 'beg' type ^beg,
- similarly, append '\$' to the string if you want to lookup entries ending with that text,
- to lookup users or groups ending with 'frog' type-in frog\$.



**Notes:** *By default the search textbox is empty which does not impose any criteria as to what groups or users are shown in the tree. After you hit the play button the first found users/groups will be shown (up to the limit given).*

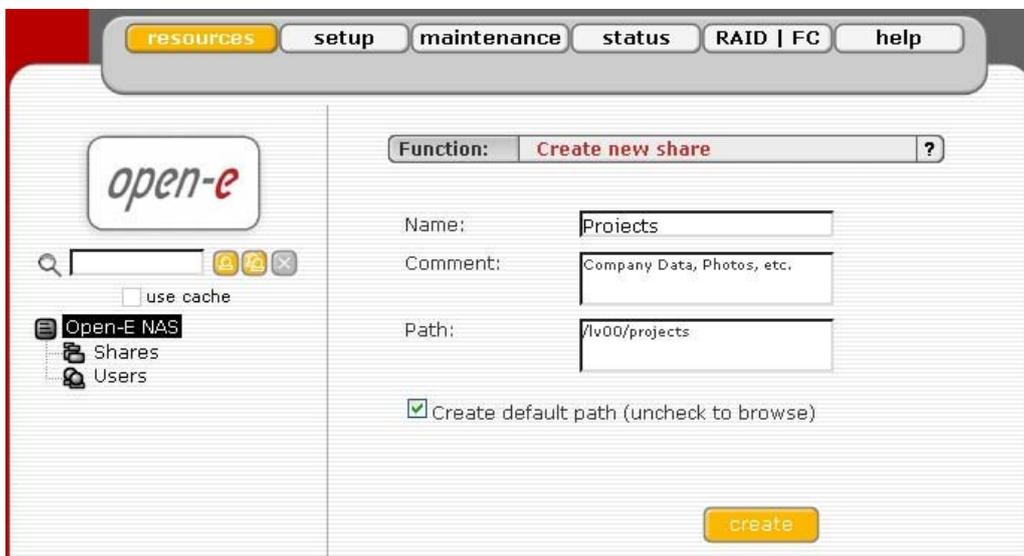
Adding elements to the tree can be a time consuming task – especially when the criteria are not tight enough and limit is set up to more than 300 entries. To cancel the operation before it is finished, click on the stop button.

### 5.2.1.1 Shares

Here, all shares on your Open-E NAS are listed. By clicking on the branch “Shares,” with Function “Create new share” you can define a new share or comment it (optional) or set the path. Organized below, you will find all existing shares, which you can edit with a simple click. With the exception of the name, you may alter all parameters. If, however, you must change a name, delete it and assign a new name.

Windows users will see the name of the share in the folders of their network environment when they click on the icon for the NAS server. The comment is only visible if the users take a look at the share properties, or if shares are listed in detail.

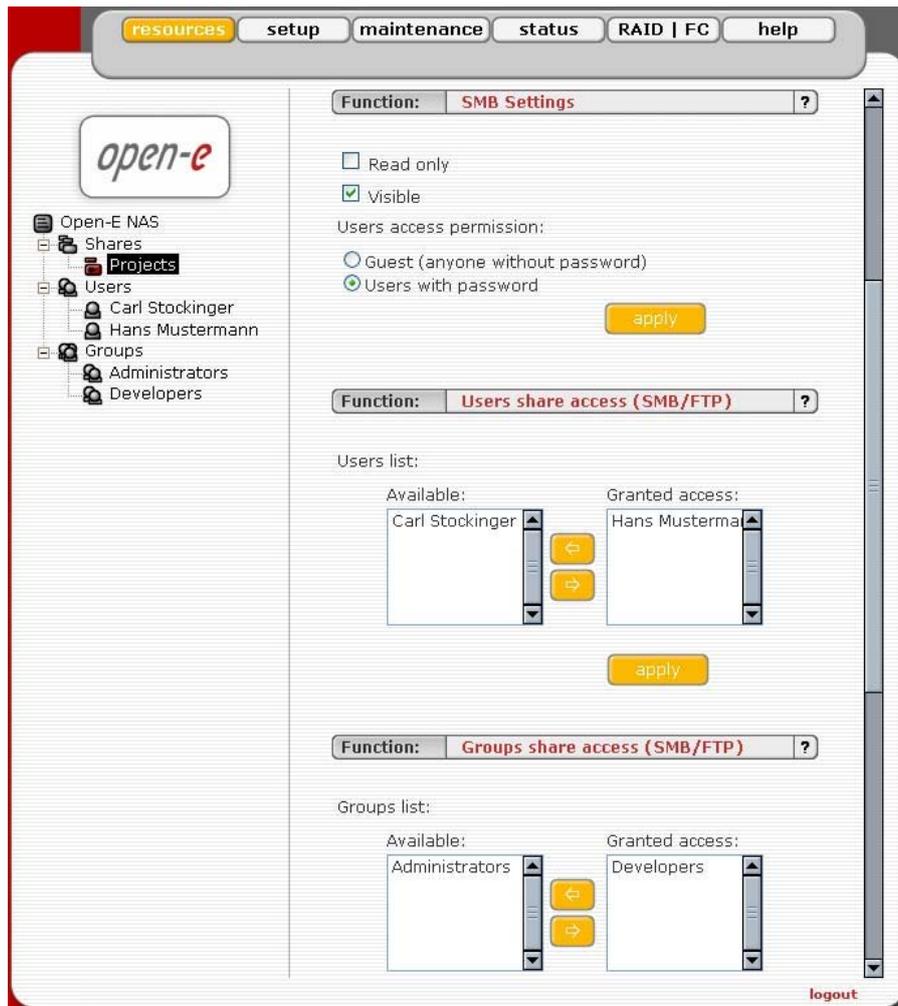
The path represents the physical location of the data on the share volume of the NAS server. The user does not know this information. In order to simplify navigation through the directories, you can use the browser function.



After clicking “create” button on left page, below on branch shares, will appear the name of earlier established share, in this case “Projects”. Then by clicking on name “Project”, you will see all available functions helpful for setting the share:

#### Function “SMB Settings Function”

Shares can be marked as “Read only,” and they can also be hidden (see below). Invisible shares are not displayed in the network environment, but they may still be used. The last parameter is “User access permission”. Either all users can be granted access (even without a password for enabling access to public folders) or only registered users with password. Please note that the entered users (user and password) have to correspond with the Windows login data.



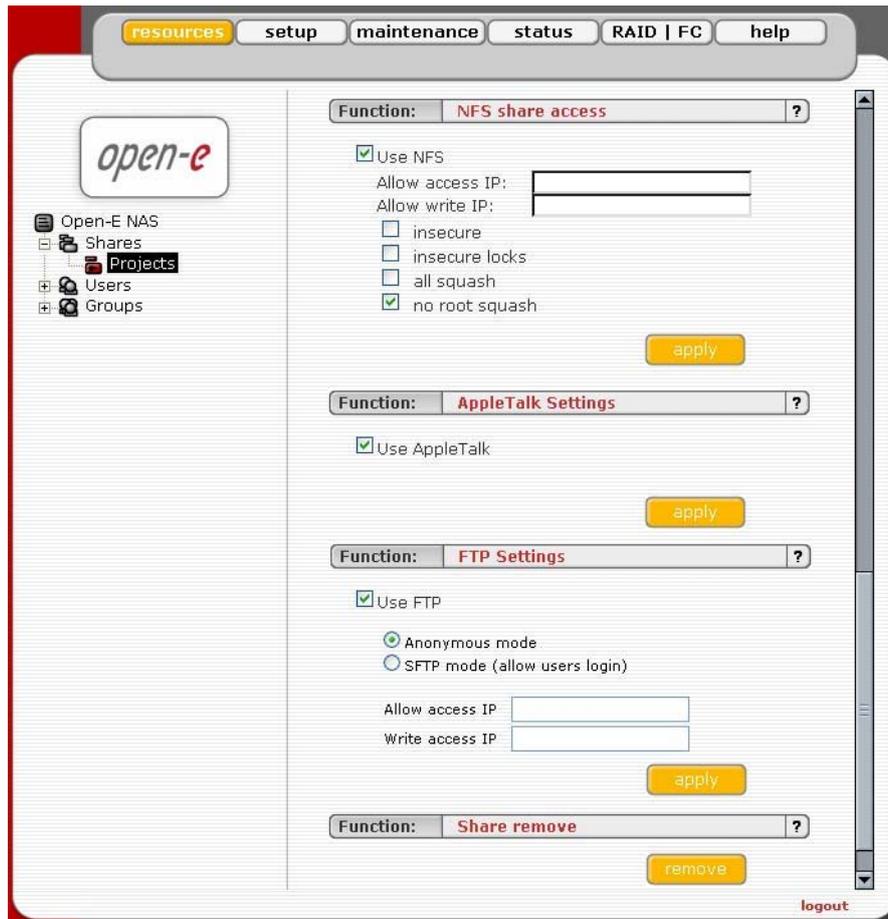
In Functions “Users share access (SMB/FTP)” and “Groups share access (SMB/FTP)” you can set the access to the shares to available users and/or groups.

### Function: “NFS share access”

Using this function you activate access to particular share via NFS. In order activate NFS on NAS server, you must enable usage of NFS in menu setup->NAS server in Function NFS settings.

In order to mount this share via NFS, please use following syntax:

- `mount -t nfs IP_addr:/share/share_name /local_mount_point`



You can fill-in the NFS options fields:

- **Allow access IP:** Please enter an IP or address range that is allowed to access NFS. You can enter single IP or multiple IP separated with semicolon or IP address range. IP addresses that will not be added to allow write list will have read only access.
- **Allow write IP:** Please enter an IP or address range that is allowed to write to NFS. You can enter single IP or multiple IP separated with semicolon or IP address range.



**Notes:** *When you leave allow access IP and allow write IP fields blank, then all computers in subnet will have write access to NFS. When you set allow access and leave allow write IP field blank, then specified computers will have read only access and none will have write access. When you set allow write IP without allow access IP, then specified IPs will have write access and all computers in the subnet will have read only access.*

- XXX.XXX.XXX.XXX
- XXX.XXX.XXX.XXX;XXX.XXX.XXX.XXX; ....
- XXX.XXX.XXX.XXX/network\_prefix\_length.

For example:

192.168.0.1/24 will set range from 192.168.0.1 to 192.168.0.254

192.168.0.1/28 will set range from 192.168.0.1 to 192.168.0.14

192.168.0.100/29 will set range from 192.168.0.97 to 192.168.0.102 you can easily calculate the network IP range using an IP Address Calculator like: [http://www.camtp.uni-mb.si/books/Internet-Book/IP\\_AddressCalculator.html](http://www.camtp.uni-mb.si/books/Internet-Book/IP_AddressCalculator.html)

- **insecure:** allows incoming connection to originate from ports > 1024.
- **insecure locks:** disables authorization of locking requests.
- **all squash:** map all users id to nobody user and all groups id to nogroup group.
- **no root squash:** select this option to grant user root from a client machine, the same level of access to the files on the NAS server. Otherwise user root from a client machine will be mapped to user nobody on the NAS server.

### Function: “FTP Settings”

Open-E NAS allows sharing files over FTP and SFTP protocols. FTP sends users' IDs, passwords and files over the network as a raw, not encrypted data. SFTP is encrypted FTP and therefore it is much more secure. SFTP allows passwords and files encryption (depending on ftp client configuration).

How to share files over FTP?

First enable the ftp server. To enable FTP go to “setup->server->Function: FTP settings”, check “Use FTP” and click the apply button.

Next, create/select share that will be accessible over the FTP protocol.

Go to the share configuration in “Function: FTP settings” and check “Use FTP” – Anonymous and SFTP modes will appear.

1. Selecting Anonymous mode will enable FTP sharing with anonymous user. For all IPs the access is set to READ+WRITE by default. To change that, activate “Allow access IP” and “Write access IP” options. Clicking apply will make the share available over FTP.

To connect to this share FTP client software is required – i.e. Internet Explorer has the FTP support. To connect from IE, enter address ftp://<NAS IP>/pub/, (e.g. ftp://192.168.0.220/pub/).

Many FTP client programs need a user name and a password to establish connection. In the Anonymous mode the user name is “anonymous” and there is no password (empty field).

All anonymous shares are in the “pub” directory. Any user connecting from the IP without a full access will see all shares but will not be able to see any directories that are prohibited.

**Hint: *Anonymous user will see only files and directories that he owns.***

2. Selecting SFTP mode will enable secure FTP sharing with the user and password authorization. Only few FTP clients support SFTP, and even fewer SFTP clients support SSL/TLS encryptions.

Here is a list of the tested software:

- CoreFTP (Windows)
- FileZilla (Windows)
- IgloFTP (Windows and Linux)
- SSLFTP (linux console client)

When SFTP is enabled, the user has the access to the share through the authorized user name and password.

**Hint: *If the NAS server uses Windows domain authorization then a short name of the domain must precede a user name – connected with a plus sign, i.e. “DOMAIN+Administrator”.***

To connect to a share via SFTP in the selected encryption, type in SFTP client NAS support SSL and TLS explicit encryption. All SFTP shares are in the “shares” directory. Users see only the allowed shares.

**Hint: *Most FTP clients have bookmarks allowing setting up IP, port home directory, etc. Suggested home directory for the Anonymous is “pub” and for SFTP is “shares”.***

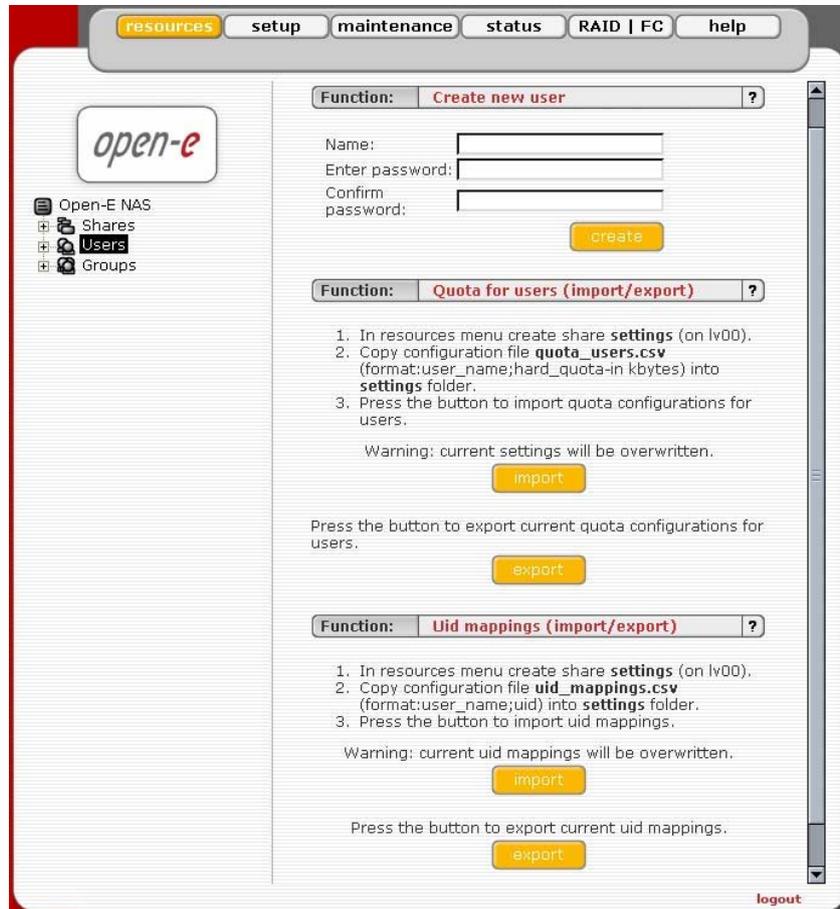
#### 5.2.1.2 User

In the mode “Workgroup internal LDAP” the category “Users” serves as data entry mask for user accounts. In principal, the process is the same as when you create shares. Enter new users here and assign each of them a name and a password. For security reasons, you have to enter the passwords twice.



**Notes: *If users forget their password, there is no way to retrieve it. You can only set a new password.***

As with all other functions, you open the entire list and select a certain user. In addition, you can remove certain users from the list. In the mode “Windows (PDC)” all users are automatically synchronized with the external server.



If you want detailed control over which shares users are allowed to access, simply assign the corresponding privileges, or add those users to an already existing user group holding the rights you want to assign to that person.

### Function: Quota for users (import/export)

This function provides administrator import/export settings of Quota for users.

#### Import

In order to import the actual Quota's settings on NAS server prepare: “**settings**” directory on lv00 volume, then copy there the previously prepared configuration file “quota\_users.csv” (see example below). Next click “Import” button – which is available in import/export function (settings will be loaded for actually existing users – in case of any errors there will be generated file with logs “quota\_users\_import.log”)

Exemplary configuration file (format:user\_name;hard\_quota\_in\_kbytes):

```
--cut--
```

```
user1;1000000
user2;200000
user9;1500000
--cut--
```

The results:

name	quota(MB)
user1	1000
user2	200
user9	1500

## Export

In order to get for users the actual Quota's settings just click on "export" button – there will be generated (ready to get) file "quota\_users.scv"

## Function: Uid mappings (import/export)

This function allows you to import and export uids (users IDs). Using this function you are able to change a lot of users ids at one time.

To import uids:

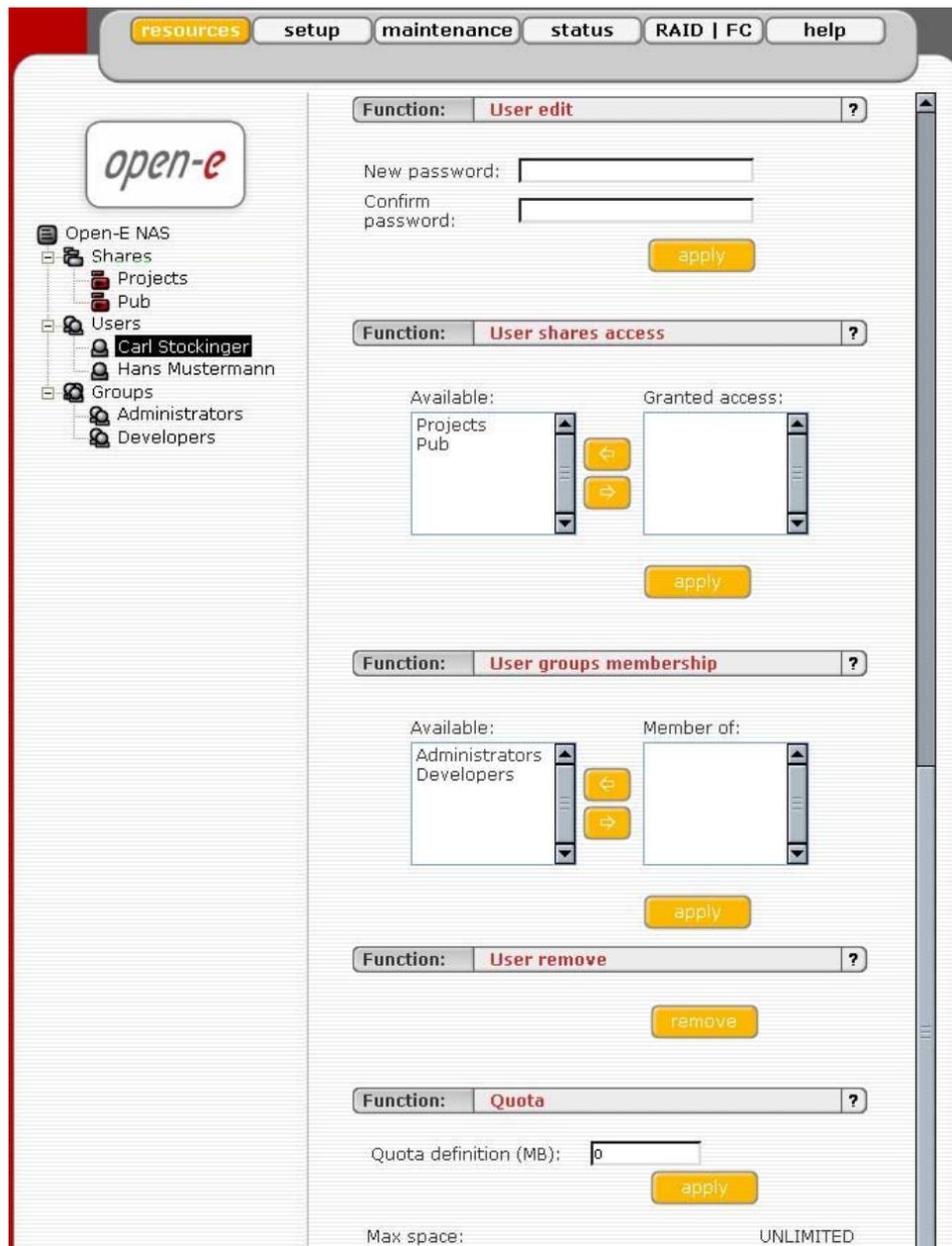
1. In resources menu create share **settings** (on lv00).
2. Copy configuration file **uid\_mappings.csv** (format:user\_name;uid) into **settings** folder.
3. Press "import" button to import uid mappings.
4. If there will be some errors while importing uids please read **uid\_mappings\_import.log** file in **settings** share



**Note: Warning: current uid mappings will be overwritten.**

To export uids:

1. Press "export" to download uid\_mappings.csv



### 5.2.1.3 Groups

In the mode “Workgroup internal LDAP,” you can define entire groups consisting of different users. In addition, you can assign these groups certain access rights. By clicking on “Groups,” a data entry mask opens up, allowing you to create a new group. Assigning the access rights is done the same way as for users (see 5.2.1.2.).

In the modes “Workgroup (external LDAP)” and “Windows (PDC)” and “Windows (ADS)” the groups are automatically synchronized with the external server.

## 5.2.2 Setup

In this menu option, you will find the following sub-functions: Server, Network, Administrator and Disk Manager.

### 5.2.2.1 Server

This is a key component of the setup menu, as some of the most crucial parameters are defined here.

The screenshot displays the 'open-e' setup interface. At the top, there is a navigation bar with tabs for 'resources', 'setup', 'maintenance', 'status', 'RAID | FC', and 'help'. Below this, a sub-menu shows 'server', 'network', 'administrator', 'UPS config', 'disk manager', and 'GUI'. The 'server' sub-function is selected, showing a 'Function: NAS Server name' section with a 'Server name' field containing 'ANCOM' and a 'Comment' field containing 'Network Attached Storage'. Below this is an 'Authentication method' section with radio buttons for 'Workgroup (internal LDAP)', 'Workgroup (external LDAP)', 'Windows (PDC)', 'Windows (ADS)', and 'Workgroup (NIS Server)'. The 'Workgroup (internal LDAP)' option is selected, and the 'Workgroup' field contains 'WORKGROUP'. Below this is a 'Clock settings' section with 'NTP Servers' set to 'ntp0.fau.de', a checkbox for 'Continuous adjusting using NTP' which is unchecked, and 'Time zone' set to 'Europe/Berlin'. The 'Set time' section has radio buttons for 'Manual', 'Use this PC time', and 'NTP server', with 'NTP server' selected. Each section has an 'apply' button. A 'logout' button is located at the bottom right of the interface.

#### Function „NAS Server name“

Select a server name that clearly identifies your new server. In the field “Comment,” you can add text describing the function and the location of the PC.

#### Function “Authentication method”

You have to select a type of authentication. Options are “Workgroup (internal LDAP)”, “Windows (PDC)” and “Windows (ADS)”. The former is the easiest option – it is suited for beginners or useful for simple storage solutions (e.g. backup servers).

The administrator has to create all users in the menu “Resources” and grant them access to the desired shares. Via “Windows (PDC)” and “Windows (ADS)”, the user database is imported from the active directory of a Windows server (with access data provided and with the necessary access rights). The administrator has to fill out the following entry fields:

Domain name: Entry of the NetBIOS domain name  
Server IP: Entry of the Windows server’s IP address  
Name: Entry of a user name with administrator rights  
Password: Entry of a password corresponding to the user



**Notes:** *Changing the authentication method can be a security risk. It is only safe to do that before permissions, quotas and owners are set. In other case, permissions like access to shares, quotas, ACL, can be mixed between users and groups.*

#### On NT 4.0 server add NAS Server to Domain

- a) Run Server Manager program from Menu Start->Programs->Administrative Tools (Common)->Server Manager
- b) From Server Manager menu select Computer->Add to Domain  
WARNING: If NAS Server is already added, you must remove it
- c) In Computer Name field enter NAS Server-Name (NetBIOS name)
- d) Click Add button

#### Set Windows (PDC) in Open-E NAS

- a) From Open-E NAS web interface choice Setup-> NAS-Server-Setup
- b) In Function - Authentication method choose Windows (PDC) option
- c) In Server IP field enter NT server IP address
- d) In Name & Password fields enter administrator account name and password of NT server
- e) Click apply button  
WARNING: If connection fails, the next try you must restart from point a (setting NT)

#### Function: “Clock settings”

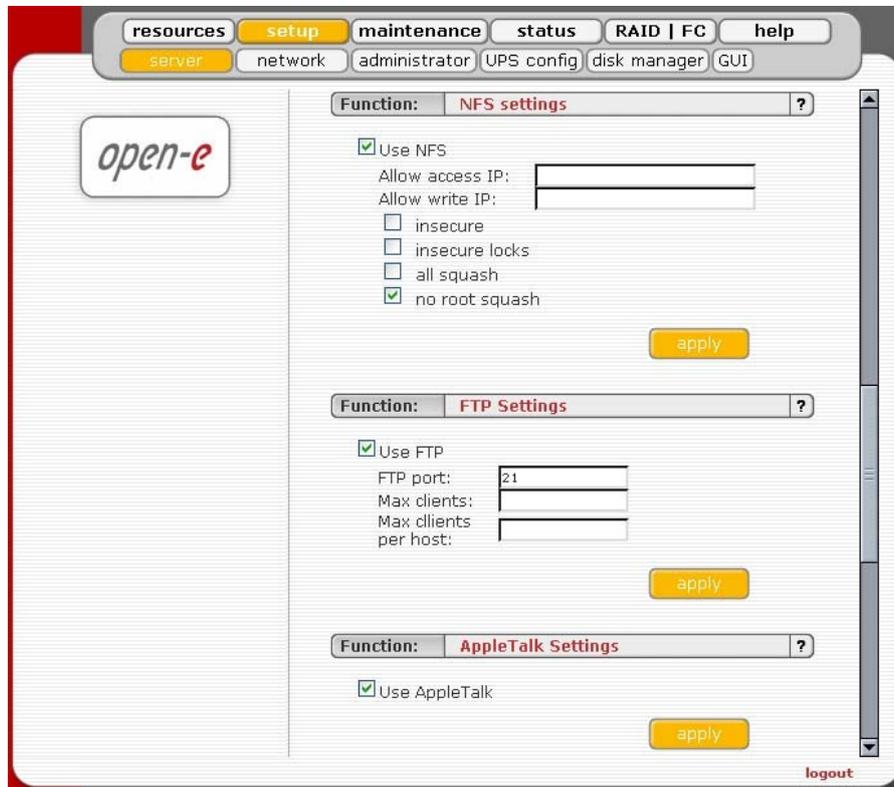
Here, you define an NTP server (Network Time Protocol) to synchronize your Open-E NAS with a time server on the Internet.



**Notes:** *Time and date display are static. What is shown are the time and date at which the setup menu was accessed.*

## Function “Set time”

With this function, date and time can be entered manually. Alternatively, take the route via an NTP server, which has to be defined in the previous function.



## Function „NFS settings“

In NFS settings you can define the NFS options for entire Open-E server.

Once you have activated NFS here, system will enable the option to activate NFS access to every share created in resources menu.

To enable NFS access to the shares created in the resources menu, you need to activate NFS for every single share separately.

Additionally, you can use an extra storage space only for NFS access and separately from other storage space used by shares created in resources menu and accessed via SMB/CIFS, FTP and AppleTalk.



**Notes:** *In order to mount NFS exclusive storage space, please use following syntax:*

```
- mount -t nfs IP_addr:/nfs /local_mount_point
```

***In order to mount the space belongs to a share created in resources menu, please use following syntax:***

- mount -t nfs IP\_addr:/share/share\_name /local\_mount\_point

The IPs-settings (addresses or networks) and other options are defined in Function NFS share access (see in 5.2.1.1)

### Function “FTP settings”

The option to also access NAS via FTP (File Transfer Protocol) offers additional flexibility, as users can access storage either from the Intranet or from the Internet. An FTP client is ideal (e.g., SmartFTP), but the Internet Explorer or a similar browser are also suitable.



***Note: Please know that the FTP feature is completely independent from the NAS shares you may have set up.***

To establish a connection, the FTP client needs several pieces of data:

IP address:	192.168.0.220 (this is the standard address)
Port:	21
User:	anonymous
Password:	123

In Open-E NAS, the allocation of access rights is done via the IP address of the PC currently in the process of accessing. A read access is, therefore, granted with these generally typical and anonymous login data. As a standard, the NAS server for FTP uses port 21, which can be changed in the configuration menu (under “Setup → NAS Server”).

If you use the Internet Explorer when accessing, you need to enter the following data into the entry line:

ftp://192.168.0.220

You are not prompted to enter the user name and password, as the Internet Explorer first establishes an anonymous connection. If you changed the FTP port, add this information to the entry line the following way:

ftp://192.168.0.220:4711 (in this example, 4711 represents the new port number).

In order to also grant specific computers write access to the FTP area, enter the desired IP addresses into the line “IP address complete access” (IP addresses should be separated by semicolons):

192.168.0.1; 192.168.0.2; 192.168.0.222; etc.

In order to assign the entire address area between 192.168.0.1 and 192.168.0.254 writing privileges enter:  
192.168.0.0/24

In order to assign the entire address area between 192.168.0.1 and 192.168.255.254 writing privileges enter:  
192.168.0.0/16

You may find details on IP calculation in internet. Just search for "ipcalc".

### Function "AppleTalk Settings"

Here you may activate the AppleTalk protocol in the network.

How to use AppleTalk with the Open-E NAS server:

Using the Open-e WEB interface:

- a. In the "NAS" Server Setup enable AppleTalk.
- b. In Resources select a share that you want to be shared with Apple Talk.
- c. Enable AppleTalk for this share.

How to connect to the NAS AppleTalk server:

#### 1. In MAC OS 9

- a. Open the Chooser (APPLE MENU->Chooser)
- b. Click on AppleShare
- c. If the Server "NAS" does not appear in the fileserver list click "Server IP address" and enter the Open-E NAS server IP
- d. Click "OK" and choose a login type. Enter a user name and password if you want to login as a specified user.
- e. From available options select shares that you want to mount.
- f. The icon of the mounted share will appear on the desktop.
- g. To open the share click on its icon.
- h. To unmount the share drop its icon onto the trash.

#### 2. In MAC OSX 10.3.

- a. Click on the MAC HD, then Applications then Utilities.
- b. From the Directory Access check if AppleTalk is active; if not -> activate it.
- c. If the server "NAS" does not appear in the Network list, open a web browser and enter the IP address of the AppleTalk server.

afp://192.168.1.3 (very important --> "afp://" )

- d. Choose a login type. Enter a user name and password when you want to login as a specific user.

- e. If you can not log in, click on the Directory Access/Authentication and change the path to search for authentication information.
- f. From available shares select all you want to mount.
- g. The icon of any mounted share will appear on the desktop.

or second example is:

- a. Click on "Connect to server" from the Finder (GO submenu).
- b. Enter: `afp://address_ip`
- c. You can add a link to the afp server by clicking on the "+" sign. This adds a link to the computer in the Favorite Servers field.
- d. Choose a login type, enter a password if you want to login as a specific user.
- e. From available shares select all you want to mount.
- f. The icon of the mounted share will appear on the desktop.



### Function „SMB settings“

With this function you can edit SMB protocol specific parameters. There are several options you can change:

- **Wins server IP:** If you have a WINS server on your network then you should set this to the WINS server's IP,
- **Superuser:** Superuser is a user, who has permission to take ownership of directory and files which belong to other users. It can be useful when administrator want to change access right ( ACL) for directory or file established by other users,

- **Simple and protected negotiation:** Simple and Protected NEGOTiation (SPNEGO) is a negotiation protocol. If you use PDA Device to access shares on NAS please uncheck it,



**Note:** *For connect to your PDA Device use netbiosname, not IP address.*

- **Store dos attributes (uses xattrs):** This option enables preserving all MS-DOS attributes using Linux xattrs attributes. It cannot be set when you are using option Preserve hidden file attributes or Preserve system file attributes,
- **Preserve hidden file attributes and Preserve system file attributes:** These options enable preserving of MS-DOS attributes: hidden and system. These attributes are mapped to x (EXECUTE) attributes for group and for others in Linux POSIX ACL. Windows ACL permissions are also mapped to Linux attributes. In order to avoid attribute mismatch, it is strongly recommended to disable these options. They cannot be set when you are using Store dos attributes option.
- **Synchronize UID and GID database with NIS server** this option allows synchronization UIDs/GIDs between NAS Server and NIS Domain. To have an properly working synchronization please fill: NIS serverdomain name, NIS server IP and Synchronize interval. With Windows systems this authentication requires PLAIN PASSWORD which can be set in the Windows registry. Please search the key HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\lanmanworkstation\parameters\ and change its Dword from 'enableplaintextpassword' to '1'.



**Note:** *This solution will the lower security. Enabling plain password will always decrease security, so please use other authentication method if there is a requirement of higher security*

## Function “Backup Client”

Here you may choose common backup software out of the drop down list in order to enable users to backup Open-E NAS-Servers with existing solutions within your network. Currently, Veritas, Retroclient and BrightStor are supported.

### Veritas:

Here you need to provide an IP address of a server running the Backup Exec. The “Directory Pass” is a password that the Backup Exec might prompt for.

### Backup:

- In Veritas Backup Exec set a user in the menu Network-> Logon Account Management,
- Next enter the password such as earlier provided in the NAS Server function “Backup client setting”,
- By choosing “Backup” a “Backup Job Properties” window will appear,
- A list of network shares will be shown in that window,
- By clicking on the „Remote Selections” branch, and next on “Unix Agents”, a NAS server name will appear (eg. Ancom),

- f. After clicking the server „Ancom/share volume”, a window „Logon Account Selection” will be displayed where you need to choose the same user name as in the point “a”.



**Note:** *In some settings, the window „Logon Account Selection” will not appear automatically. In this case you must right mouse click on the name „Ancom/share\_volume”, and then in the context menu choose „Connect As...”. Only then the „Logon Account Selection” window will appear.*

- g. After choosing a user, the „Logical Volume” and NAS server shares will appear. By selecting the correct share and clicking the „Run Now” button, selected shares will be backed-up.

#### **Restore:**

- a. By choosing „Restore”, a “Restore Job Properties” window will appear.
- b. On the left side of the window, in Properties->Source click „Selection”, and the name of the NAS server which shares were earlier backed-up will be displayed.
- c. Choose a folder you want to be restored from the correct backup file.
- d. From the Source->Resource Credentials menu choose a user account for the NAS Ancom/share\_volume server and click the „Run Now” button.

**Hint:** *In order to use an Incremental method, choose it from the Setting -> General-> Backup Method menu. Please use method “Incremental – Using modified time” (Reset Archive bit – does not work on the XFS partition types).*

#### **BrightStor:**

“Allow IP or Network IP”: Please enter the Backup server’s IP address in order to grant access to Open-E NAS (please refer to the last caption “FTP Settings” for syntax details). If you leave this field empty, all BrightStor backup servers in the network will have access to the NAS server.

#### **User:**

By providing a user name, only this BrightStor user will have access to Open-E NAS. If left empty, all users will be able to access the NAS server.

#### **Function “Language Settings”**

English and German are supported.

#### 5.2.2.2 Network

#### **Function “IP address”**

If you want to select an address instead of assigning an IP address automatically via DHCP, you can do it here.

It is strongly recommended to use static IP for the server (please uncheck *Use DHCP* box). If you set new IP address, during activation, you will lose your connection to the server and you will have to log in again. In the URL entry line of your browser, please enter the new IP address. If you do not get access, please try the console to set new IP address. In order to access servers in another subnet, you need to enter the address of a router as *Gateway*.



**Notes:** *In case you use NTP server to maintain proper time & date, please make sure you have proper Gateway and DNS settings.*

The screenshot displays the Open-E web administration interface. At the top, there is a navigation bar with tabs for 'resources', 'setup', 'maintenance', 'status', 'RAID | FC', and 'help'. Below this, a sub-navigation bar includes 'server', 'network', 'administrator', 'UPS config', 'disk manager', and 'GUI'. The 'network' tab is selected. The main content area is divided into three sections:

- Function: IP address**: This section allows configuring network parameters for the selected interface (eth0). It includes a checkbox for 'Use dhcp' (unchecked), and input fields for IP (192.168.1.2), Netmask (255.255.255.0), Broadcast (192.168.1.255), Gateway, and DNS (192.168.1.1). An 'apply' button is at the bottom.
- Function: NIC assignments**: This section allows assigning network services to the selected interface (eth0). It shows checkboxes for 'www' and 'smb', both of which are checked. An 'apply' button is at the bottom.
- Function: Create ethernet team**: This section allows creating a network team. It includes a 'Team name' field (team0), a dropdown for 'AFT', checkboxes for 'eth0' and 'eth1' (both unchecked), dropdowns for 'no\_priority' for each interface, and a 'Virtual interface' field (vth0). A 'create' button is at the bottom.

A 'logout' link is visible in the bottom right corner of the interface.

### Function „NIC assignments“

Using this function you can disable access to the “Open-E NAS WEB administration”, for NICs in the Open-E NAS system. If a “www” option is inactive, it is not possible to launch the “Open-E WEB administration” on the selected network card (e.g. “eth0”). If the option SMB is in an active mode, the access to the network shares with LDAP, ADS or PDC authentication will not be possible.



**Notes:** *The access to WEB GUI can also be blocked, by setup->Administrator in the function „Administrator access“. If in the “Open-E NAS” system there is only one network card installed, the “www” option must remain active.*

## Function “Create ethernet team”

Function “Create ethernet team” include failover protection, increased bandwidth through aggregation, and balancing of traffic among team members. Ethernet team modes are AFT, SFT, ALB, RLB, SLA and 802.3ad.

Ethernet team modes:

- **Adapter Fault Tolerance (AFT)**  
Allows mixed models and mixed connection speeds as long as there is at least one Intel® PRO server adapter in the team. A 'failed' Primary adapter will pass its MAC and Layer 3 address to the failover (secondary) adapter. All adapters in the team should be connected to the same hub or switch with Spanning Tree (STP) set to Off.
- **Switch Fault Tolerance (SFT)**  
Uses two (total) adapters connected to two switches to provide network availability of a second switch and adapter if the first adapter, its cabling or the switch fail. Do not put clients on the link partner switches, as they will not pass to the partner switch at fail. Spanning Tree (STP) must be On.



**Note: SFT uses only one team. Only 802.3ad DYNAMIC mode allows failover between teams.**

- **Adaptive Load Balancing (ALB)**  
Offers increased network bandwidth by allowing transmission over 2÷8 ports to multiple destination addresses, and also incorporates Adapter Fault Tolerance. Only the primary receives incoming traffic. Only the primary transmits broadcasts/multicasts and none routed protocols. The ANS software load balances transmissions, based on Destination Address, and can be used with any switch. Simultaneous transmission only occurs at multiple addresses. This mode can be connected to any switch.
- **Receive Load Balancing (RLB)**  
Offers increased network bandwidth by allowing reception over 2÷8 ports from multiple addresses. Can only be used in conjunction with ALB. Only the adapters connected at the fastest speed will be used to load balance incoming TCP/IP traffic. The primary, regardless of speed, will receive all other RX traffic. Can be used with any switch. Any failover will increase network latency until ARPs are re-sent. Simultaneous reception only occurs from multiple clients. On NetWare servers, If using NetWare Load Balancing, you can use ALB but not RLB.



**Note: Adaptive Load Balancing (ALB) and Receive Load Balancing (RLB) are supported for Intel NIC's only !**

- **SLA option - Intel Link Aggregation (LA), Cisco\* Fast EtherChannel™ (FEC) and Gig EtherChannel™ (GEC)**  
Supports Fast EtherChannel standard. All adapters in the team can transmit and

receive. All adapters appear to share a single MAC and L3 address. The load is balanced based on Source/Destination Address Pairs and simultaneous transmission only occurs to multiple addresses. Reception load balancing is determined by the switch. Capable of aggregating 2÷8 ports (based on switch capabilities). Please see Cisco standards for FEC/GEC. Must be used with Cisco FEC/GEC capable switches or Intel switches capable of Link Aggregation or switches capable of 802.3ad.



**Note:** *For EC/LA and 802.3ad modes be sure to check your switch's actual capabilities and requirements.*

- **IEEE 802.3ad**

This standard has been implemented in two ways:

- **Static** mode (the majority of switches on the market) is equivalent to Ether Channel/Intel's Link Aggregation and adapter teams should be set up in FEC/LA/3ad mode. Must be used with an 802.3ad, FEC/GEC/ or Intel Link Aggregation capable switch. (For additional information see Fast EtherChannel above.) This is the 802.3ad available in 8.x software.
- **DYNAMIC** mode requires 802.3ad DYNAMIC capable switches (limited availability). Active aggregators in software determine team membership between the switch and the ANS software (or between switches). This is available only in some versions of Intel(R) ANS software. There is a maximum of 2 aggregators per server and you must choose either maximum bandwidth or maximum adapters.

Both 802.3ad modes include adapter fault tolerance and load balancing capabilities. However in DYNAMIC mode load balancing is within only one team at a time.

### 5.2.2.3 Administrator

#### Function “Administrator Password”

Using this function, you can change the passwords for Open-E NAS administration accounts. For security reasons, please make sure you change the standard password and select a new one. Three accounts are available by default: Administration (limited access), Maintenance (Enhanced) and Full Access (Maximum Access).



**Note:** *Password-checking is case-sensitive. For security reasons, the password you enter will not be displayed. Please check the status of the Shift and Caps Lock keys.*

## Function “Administrator Access”

Use this function to restrict access to the server administration.

- **Set port:** you can change https port (default 443)
- **IP address:** you can assign IP addresses (separated by a semicolon) that are allowed to access the Open-E iSCSI Web administration. This field left blank means no restriction.
- **Lock console without password:** disables access to the console
- **Lock console with password:** to get access to the console you need to type in a password. Note that this password should be exactly 8 characters long and include only 1-4 digits.
- **Unlock console:** the unrestricted access to the console



**Notes:** *Please exercise caution with this function when all computers in the network have assigned IP addresses via DHCP: any current IP can be replaced by a new one only after the lease ends. Please use Lock console feature carefully – in case of any erroneous IP address settings you will not be able to reset default administrator access*

*from the console. To restore default settings you have to re-update software in the Open-E NAS module or contact technical support.*

### Function “E-mail notification”

In case of significant events, critical errors, warnings, etc., system can send an email to the administrator. Please enter administrator email address.



**Notes:** *When SMTP server receiving mail, uses the monitoring function of IP numbers, it compares IP number from SMTP server (for example open-e.com) with IP number of a computer from which email was sent. This email may be treated as “spam” and will not be accepted. To avoid the above problem, use different SMTP server then the computer currently uses. The best solution for a correct email distribution is to use your local mail server.*



### Function “SSL Certificate Authority”

If you want to install Certificate Authority (CA) to your web browser, click on the **SSLCert.crt** link. Download CA on Desktop, click on it and "Install Certificate". Browser will show you warning, that CA is not trusted and it is normal. Following the instructions, you will install CA to your web server.



**Notes:** *If you want to delete or view CA go to: Tools->Internet Preferences ->Content->Certificates->Trusted Root Certification Authorities and OPEN-E GMBH which should be there.*

## Function “SNMP Settings”

Simple Network Management Protocol (SNMP) is a protocol for monitoring a network and computer equipment. You can monitor:

- ethernet bandwidth,
- used memory,
- used swap,
- CPU load,
- SYSTEM load,
- Uptime,
- MAC addresses of network card.

Default SNMP community is "public" and here you can change it. The community you are setting can be max up to 20 characters. It is for your better security. System location and system contact are only for your information, for example when you connect from SNMP client, you will see your location and name. SNMP is used for synchronization too.



**Notes: For better security use only SNMP 3 version! This version provides login, password and encrypted transmission.**

How to retrieve information from SNMP ?

From Linux:

- snmpwalk --> it is command-line tool from snmp-package.

You can get information by:

```
snmpwalk -v 3 -u public -l AuthNOPriv -A MD5 -A public123 adres_ip SysUpTime
```

- v 3 --> use only 3 version
- u public --> community name
- A MD5 --> encrypted by MD5
- A public123 --> password
- address\_IP --> IP of NAS server
- SysUpTime --> OID with system uptime information

To use SNMP from command line you have to know OID's, for example:

ssCpu (processor load), mem (memory info), Location.

But it is not the best choice to retrieve info from command line. You have to install SNMP client, so you can easily read any information you want.

From MS Windows you can use following Windows Clients: PRTG, MIB Browser Professional, SNMP MIB Query Manager and INFTRAF.



**Notes:** *If you can't retrieve information from SNMP client, you can check [NAS\\_ip/check\\_sys/index.html](#). There are SystemLoad, CPU, Memory, Swap and Uptime.*

### Function “Remote Access”

Using this function, you can administrate console tools remotely by ssh protocol (secure shell). Default user is 'cli' and you cannot change it, but password can be change.

#### **Allow IP:**

You can assign IP addresses (separated by a semicolon) that are granted to server remote access. The field left blank means no restriction.

#### **Set port:**

Default port is 22222 for security reasons, because high ports are invisible for port scanners. You can change it only from range 1024-65535 except ports already used.

#### **Password:**

Length of password is minimum 8 characters. Be sure to use strong passwords.

#### **Confirm password.:**

Please retype your new password.

Password cannot contain:

- characters: ' " ` ^ & \$ # [ ] \ | \*
- spaces.

To connect to server from Linux/MacOSX systems use:

```
ssh -2 -p 22222 -l cli address_ip
```

- option: -2 is a version of ssh protocol used for connection.
- option: -p is a port for Remote Access.
- option: -l is a user (In our product the user must be "cli").
- option: address\_ip is a address of server you want to connect to.

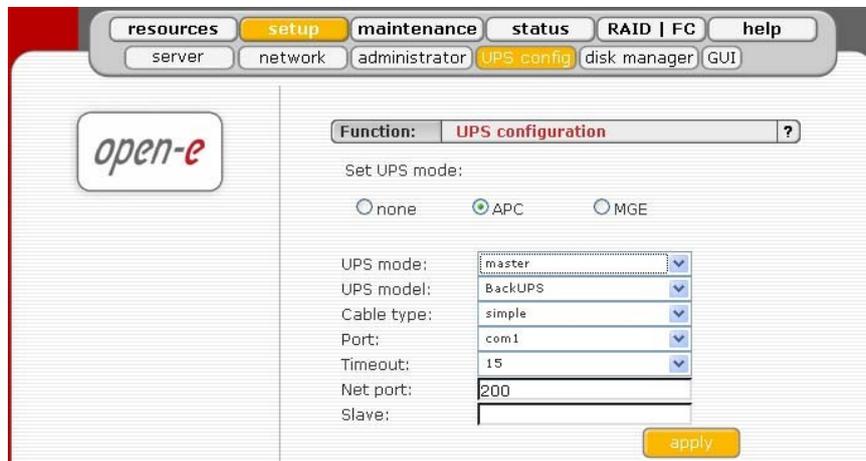
You will be ask for a password you entered on server for Remote Access.

To connect to server from Microsoft Windows, download free ssh client Putty ([www.putty.nl](http://www.putty.nl)). For PuTTY here is mini-how to:

- In Host Name (or IP address) field please enter IP address of the NAS
- In Port field please enter same port as in the NAS GUI (default 22222)
- In Protocol please choose SSH
- In Category: Connection - Auto-login-username please enter: cli
- In Terminal-Keyboard-The Functions Keys and keypad please select VT100+

Go back to category session and click on Save button. Then click on “open” and enter the password. (In case you did not enter Auto-login-username it will prompt for username, so please enter: cli)

#### 5.2.2.4 UPS



In the UPS menu you can select a UPS device desired (Uninterrupted Power Supply). For the connection of the UPS device to the NAS server, the USB port is most frequently used. In the settings you can select the UPS model, cable type, connection port and the length of the time out. The time-out defines the time between a power failure and the moment the system will shut down. UPS support 3 modes:

**Simple** means, that Open-E NAS is the only system attached to this UPS and that there is no action necessary to do remote shutdown for other systems in the network.

**Master** means, that Open-E NAS is connected to the UPS and sends a signal through the network to shutdown other systems in the network.

**Slave** means, that Open-E NAS is reacting on a "power down-signal" from an UPS master.

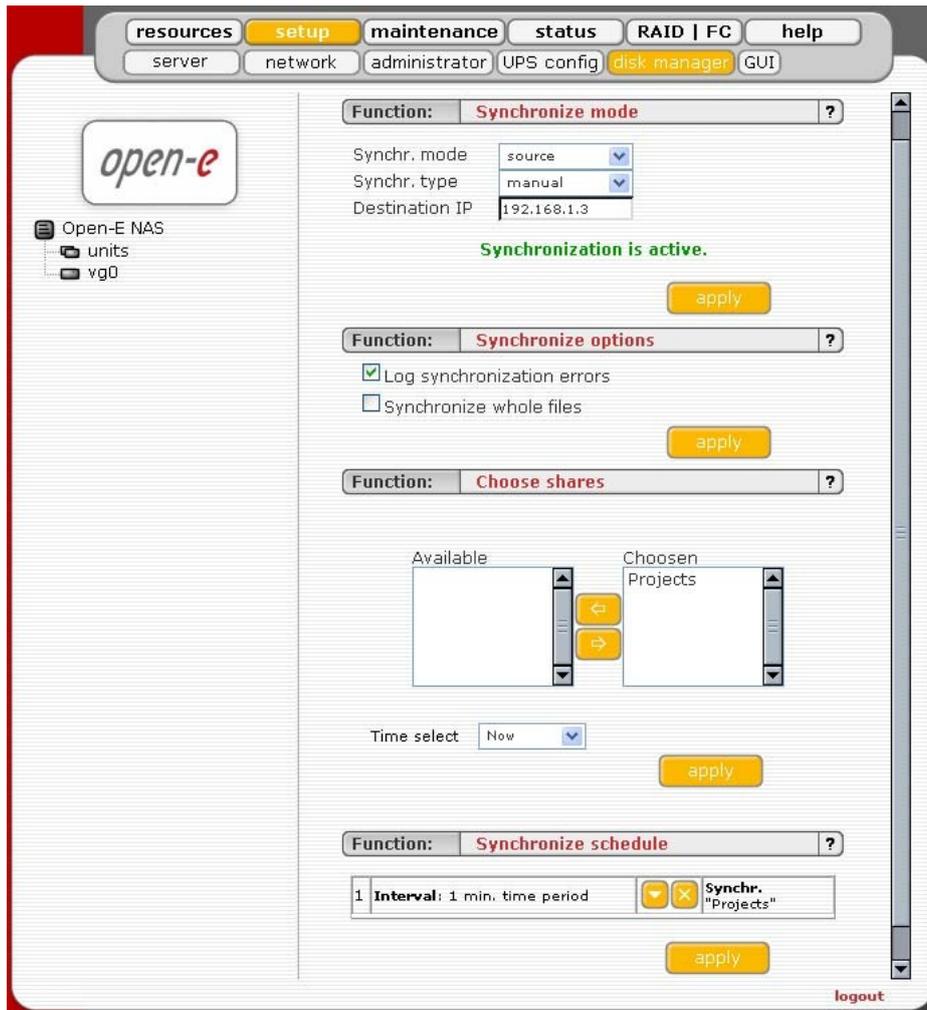


**Notes:** *During a power failure you cannot log into the Open-E NAS server. Users who are connected to the Open-E NAS server during the UPS-time remain full access to all files on the NAS server.*

#### 5.2.2.5 Disk Manager

If more than two Open-E NAS servers are in use, you have the option to synchronize shares between them. Please configure the shares, providing NAS server as “source” and pick the desired shares by adding them to the right window. Then type the IP address of the NAS server into the corresponding field and pick a synchronization interval. Please consider that choosing small intervals can increase network traffic considerably.

The destination machine needs to be configured as “destination” using the “Synch. Mode” drop-down. Again, you need to provide the IP access of the source NAS server.



**Notes:** *The synchronization has to be started by clicking “apply” with both the source and the destination NAS server.*

To configure a source mode:

1. Select "source" from “Synchr. mode” to choose the role of the source for this node.
2. Give the IP address of the destination node in the "Destination IP" field.
3. If your destination NAS is in version 1.71 or above you can choose "automatic" synchronize type, otherwise please choose "manual".
4. Click apply

If this node acts as a destination:

If your source NAS is in version 1.71 or above and you have chosen "automatic" synchronize type on source NAS, then you do not need to configure destination NAS!

1. Select "Synchr. mode" to destination
2. Type in the address of source node.
3. If your source NAS is in version lower than 1.71 please choose "manual" destination synchronize type.
4. Click apply



**Note:** *To add shares to synchronize use function "Choose shares"*

### Futures of automatic type of synchronization

- operates at port 22122 instead of port 22 in "manual" version
- there is no need to set manually the destination NAS, all will be done automatically
- support for acls
- there is possibility to synchronize shares on all logical volumes

Operation of synchronization process requires you to define at least one snapshot for each volume group from which shares you want to synchronize. When using "manual" type of synchronization it is enabled by clicking "apply" on both the source and the destination mode and precisely in that order.

To disable any synchronization scheme set "synch. mode" to "none" and click "apply"

### Function: "Synchronize options"

This function allows you to set additional parameters for synchronize. Available settings are:

- **Log synchronization errors:** If you enable this feature every synchronization error will be logged. If you will also enable sending logs via e-mail they will be also sent by e-mail. This feature is enabled by default.
- **Synchronize whole files:** If you enable this feature each changed file will be send whole not only the changed part of file. This can fasten synchronization when using 1 Gb or 10 Gb network cards. This feature is disabled by default.

### Function: Choose shares

This function allows you to add shares to synchronize with remote NAS. It is available only when this NAS is in synchronize "source" mode.

- To add new shares to synchronize please select shares from left side and click on 
- You can start synchronization immediately by selecting "Now" from "Time select" combo box or add to schedule.



**Note:** *When using "automatic" synchronization type you can choose from all shares but synchronization will work only for shares which logical volume is present also at destination NAS. In "manual" synchronization type you can choose shares located on lv00 only.*

## Function: Synchronize schedule

This function allows you to edit previously saved synchronize schedules. There are available 2 types of schedule: weekly and interval.

- **Interval:** Synchronization will be made every "selected time". Example if you choose interval 1 h. - each one hour share will be synchronized.
- **Weekly:** Synchronization will be made in selected days at specified time.

To edit properties of schedule please click at 

To delete schedule please click at 

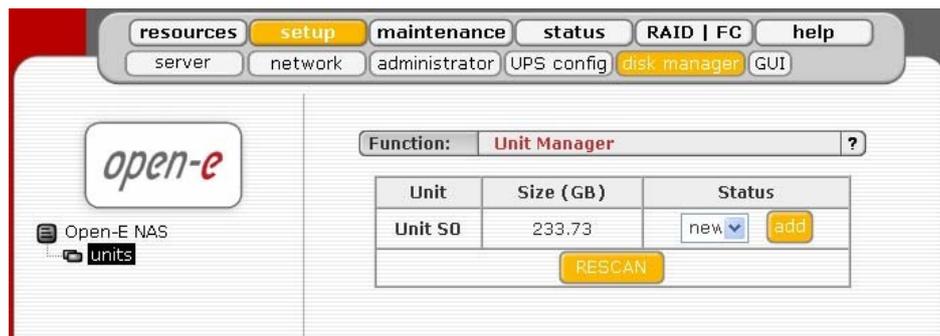
You can also delete a schedule by setting interval to "not set" or deselecting all days and unset time when using weekly schedule.



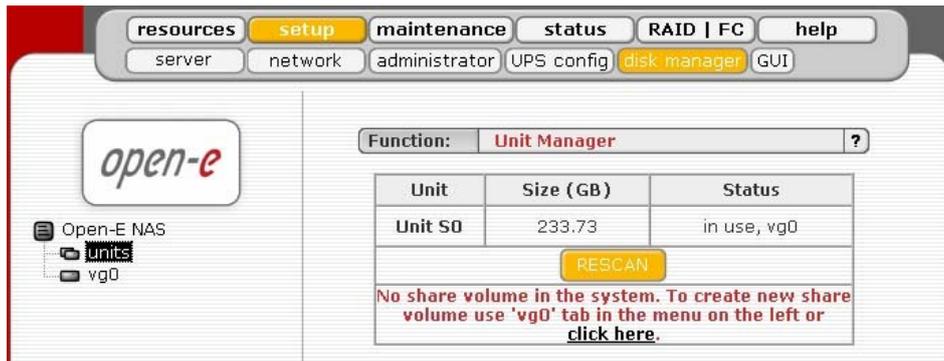
- Notes:**
1. *It is possible to edit time of synchronization. If you want to edit shares to synchronize please delete this schedule and add new.*
  2. *It is possible to perform one synchronization at once. If you schedule a few synchronizations at the same time, only one will be done.*

## Function "Unit Manager"

After clicking on the branch "units" in the left part of page you will find a list of all available units (raid-arrays) with entire disk size. In order to integrate available units into the share volume (volume group), just use the "add" button, after which the unit will be formatted.



Next, the page will be reloaded (see below), and status field will show your units as "in use" and with new group e.g. "vg0". The Volume Group is the equivalent of a physical disk from the system point of view. It is also possible to combine two (or more) units into one Volume Group by choosing one of actually existing groups like "vg0", or by choosing "new" option which will create new group "vg1" after using "add" button.



**Notes:** *When the added unit is integrated, it cannot be remove in Web management. You need to use extended tools in console.*

### Function “Units Assigned “

Here listed units assigned to current volume group.



### Function “Share Volume/Logical Manager“

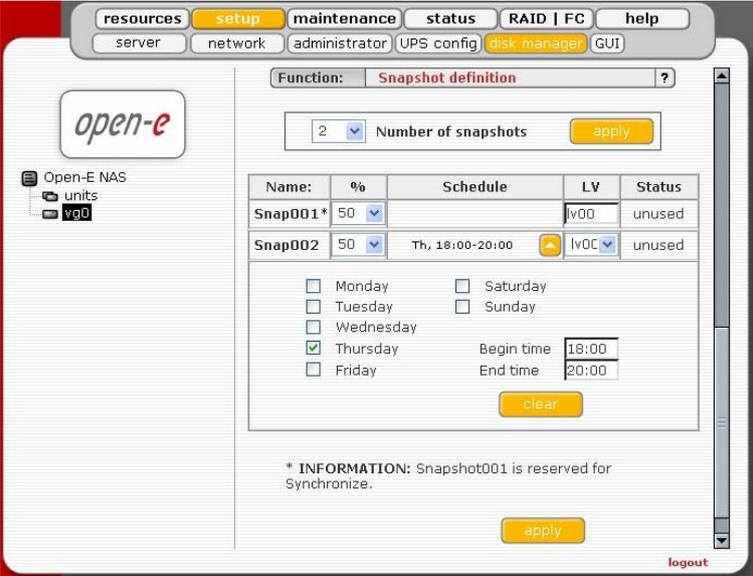
Using this function you can create a Logical Volume (lv) inside one Volume Group. The Logical Volume is the equivalent of partitions, which this storage space is available for network shares. You can increase capacity of existing Logical Volume.

Depending on needed capacity administrator can add more capacity to particular Logical Volume. Using Share Volume/Logical Manager function you can add disk space to new lv, or increase size on existing lv's (you can't decrease lv size). To set needed lv size use scrollbar, next to which, on the right side is shown size available to use.

This function can be also used to reserve disk space for “snapshots” and “swap”. Usually for “snapshots” you need about 10% of new Volume Group.

The SWAP is an additional disk space used by the system to temporarily release some amount of used RAM memory. So, one can reserve some shared disk space for the system SWAP memory. Last time we have added a lot of new features consuming in total some amount of additional memory, so in some cases e.g. 512MB would not be enough and some processes might stop working - the SWAP would prevent.

Function “Snapshot definition”



This feature takes so-called snapshots of the file system. The Snapshot function of Open-E NAS enables the system administrator to freeze the data content of the network drive unnoticed from the users at a certain time. From this moment on, the users work on a virtual data volume, all changes to the volume are stored in a different partition. The storage of all changes is independent of the file-system Open-E NAS uses on block-level. Only when the snapshot is deleted / removed the changes are permanently transferred to the actual data volume. Through a separate share, which is only available for the administrator (or backup administrator), a complete backup of the dataset can be done. With the snapshot technology even a database can be backed up while the users are working on it.

Another application is the acquisition of changes in very serious environments. Subject to the condition that enough system resources are offered, up to 100 snapshots can be stored for a long history of the dataset. This option is used at lawyers, notary or software development.

The Snapshot function is perfectly transparent for the users in the network. Only the administrator can work with the Snapshots.



**Note:** Please be generous, when you are calculating the space reserved for snapshots. If you delete 3 GB of files and restore them, this is handled as 2 actions and 6GB of snapshot space is used up. You should reserve at least 3 times the space of changes you expect per snapshot. When you run out of space in the snapshot folder, the snapshot is deleted / removed immediately. You do not lose data in that case, just the

***dataset, which is virtual for the users at the moment, will be written to the data volume. The old dataset, which has been frozen with the snapshot, is not available any longer.***

Snapshots can be activated/deactivated manually or automatically. In the schedule options "Begin time" and "End time" and day of week are used for automatic snapshots: this is the time of automatic activation and deactivation (syntax is "him"). When snapshot start is set, the snapshot will be deactivated and activated again at the given time.

Alternatively, snapshots can be taken manually in the Maintenance->Snapshot menu even if snapshots are automatically created under "Snapshot Definition". Button remove all can be useful for removing all snapshot at one time.

Snapshots are shared via SMB/CIFS protocol, but for authenticated users only. Access to snapshots can be granted in Maintenance->Snapshot.

Recommendation: Use only as many active snapshots as really needed – a large count of active snapshots can slow down the system considerably.



***Notes: The snapshot will become inactive if the content exceeds the snapshot capacity. Also, please take into account that changing the amount of snapshots will automatically reset the whole snapshot configuration!***

Configuration example:

Snapshot	Res. %	Begin	End
Snapshot02	50%	6:45	N.A.
Snapshot03	5%	10:00	10:30
Snapshot04	10%	13:00	13:40
Snapshot05	10%	15:00	16:00
Snapshot06	1%	16:00	22:00

This example is suitable for companies that start working at 7 am and end around 3 pm. Every morning - before everybody starts working - snapshot02 will be created (refreshed). This snapshot is designed to hold data from the beginning of working day untouched to the end of the day. This will enable simple access to files changed at the same day in order to look at previous file version.

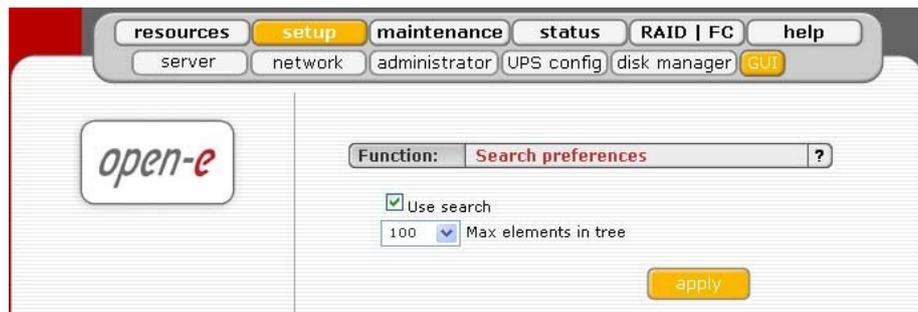
After three hours of work, the second snapshot (03) will be created and will stay active for 30 minutes. At this time, the backup server (Brightstor, for example) will connect to clients that are running Open-e NAS and backup all data. This same situation repeats at 1 pm and 3 pm - but with one difference - at this time, there is much greater activity (many more files are written), because at 3 pm all changes are stored in expectation of leaving off work.

The last snapshot with only 1% reserved space is forerunning backups on a tape device with a backup server. This backup takes much more time as backing up one single hard drive.

## 5.2.2.6 GUI

### Function; „Search preferences“

With this function you can enable or disable searching option in “resources” menu. Also you can set up to 500 elements in tree of users or groups



## 5.2.3 Maintenance

This page accessed with the Maintenance tab contains settings and functions pertaining to general management operations.

### 5.2.3.1 Shutdown

#### Function „System shutdown“

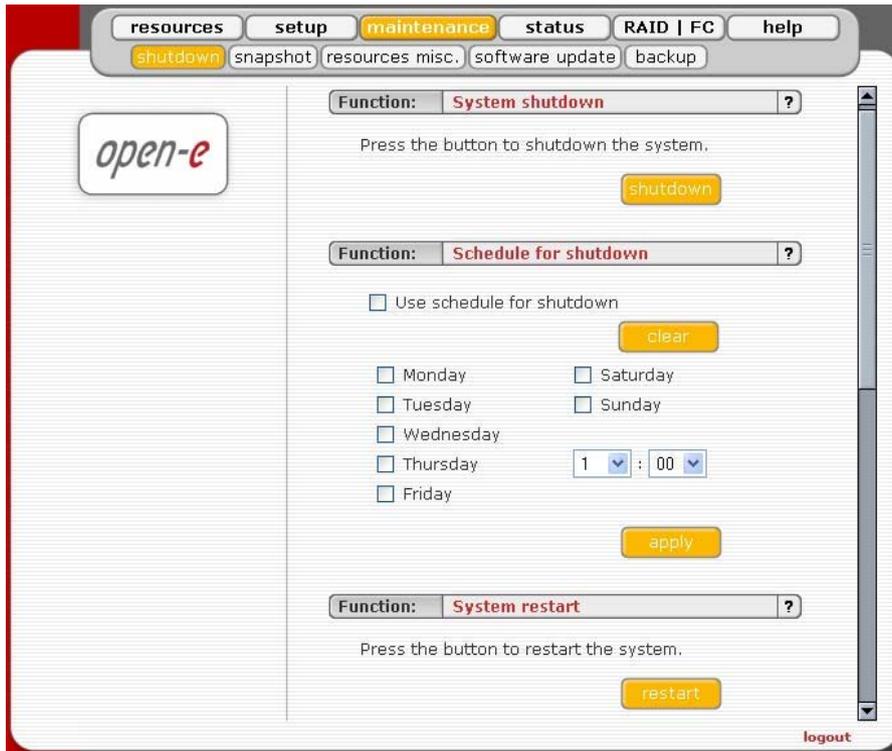
When using this function, you can shut down the NAS server. If any of your users are currently connected, you will be asked to confirm the shutdown. If no users are connected, the process will be executed immediately without any delay.



**Notes:** *The NAS server can only be turned on again manually.*

#### Function „Schedule for shutdown“

Here you can set more specific information like the time and day of a week for the shutdown.

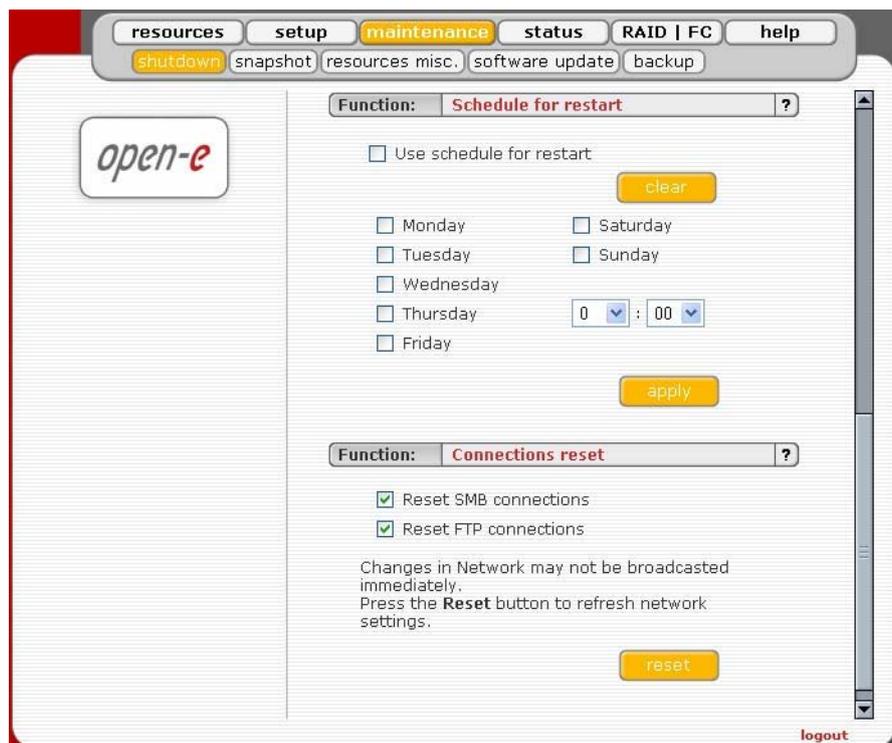


### Function “System Restart”

This function is self-explanatory: It allows restarting the system.

### Function “Schedule for Restart”

This control lets specify a time the planned system restart will be taking place.



## Function “Connection Reset”

When using this function, you can update all network settings including all changes previously made. This function also allows informing all clients directly about any changes made to shares and access rights. All clients will receive the update immediately. Otherwise, it may take several minutes before all clients are informed about any changes.

You can choose to reset SMB and/or FTP connection.



**Caution:** *Disconnecting your users while any files are open may lead to data loss.*

### 5.2.3.2 Snapshot

Here you can instantly create and remove snapshots without going to the “Snapshot definition” in “setup->disk manager”. This can be useful if you need to make considerable changes to your data while you don’t know if these changes are supposed to be permanent.

### Function “Snapshot access”

This tool enables adding and removing users who have access to snapshot images.

To grant access to snapshot images select a user from the column "Available" and click the appropriate arrow sign.

To revoke access to snapshot images from a user select the user from the column "Granted access" and click the appropriate arrow sign.

The screenshot shows the 'open-e' maintenance interface. At the top, there are navigation tabs: resources, setup, maintenance (selected), status, RAID | FC, and help. Below these are sub-tabs: shutdown, snapshot (selected), resources misc., software update, and backup. The main content area features a table with columns: Name, %, Auto, Status (creation date), LV, and Operation. The table lists three snapshots: Snap001\* (33%, manual, unused, lv00, not avail.), Snap002 (33%, manual, active (2005-08-01 23:44:28), lv00, remove), and Snap003 (33%, manual, unused, lv00, create). Below the table is a 'Remove all snapshots' button. An information note states: '\* INFORMATION: Snapshot reserved for Synchronize.' The 'Function:' dropdown is set to 'Snapshot access'. There are two lists: 'Available:' containing 'Carl Stockinger' and 'Hans Musterma', and 'Granted access:' which is empty. Arrows between the lists allow moving users. An 'apply' button is below. The 'Function:' dropdown is also set to 'NFS snapshot access'. There is a checked 'Use NFS' checkbox, an 'Allow access IP:' input field, and an unchecked 'insecure' checkbox. An 'apply' button is at the bottom. A 'logout' link is in the bottom right corner.

Name	%	Auto	Status (creation date)	LV	Operation
Snap001*	33	manual	unused	lv00	not avail.
Snap002	33	manual	active (2005-08-01 23:44:28)	lv00	remove
Snap003	33	manual	unused	lv00	create

### Function “NFS snapshot access”

With this function you can activate access to the snapshots via NFS.

In order to mount snapshot via NFS, please use following syntax:

- `mount -t nfs IP_addr:/snapshot/xxx/nas /local_mount_point`

Where **xxx** is the snapshot number e.g. **002** for Snap002

You can fill-in the NFS options fields:

- **IP Addr:** Please enter an IP or address range that is allowed to access NFS. You can enter single IP or multiple IP separated with semicolon or IP address range.
  - `xxx.xxx.xxx.xxx`
  - `xxx.xxx.xxx.xxx;xxx.xxx.xxx.xxx; ...`
  - `xxx.xxx.xxx.xxx/network_prefix_length`.

For example:

192.168.0.1/24 will set range from 192.168.0.1 to 192.168.0.254

192.168.0.1/28 will set range from 192.168.0.1 to 192.168.0.14

192.168.0.100/29 will set range from 192.168.0.97 to 192.168.0.102

you can easily calculate the network IP range using an IP Address Calculator like:

[http://www.camtp.uni-mb.si/books/Internet-Book/IP\\_AddressCalculator.html](http://www.camtp.uni-mb.si/books/Internet-Book/IP_AddressCalculator.html)

- **insecure:** allows incoming connection to originate from ports > 1024

### 5.2.3.3 Miscellaneous Resources

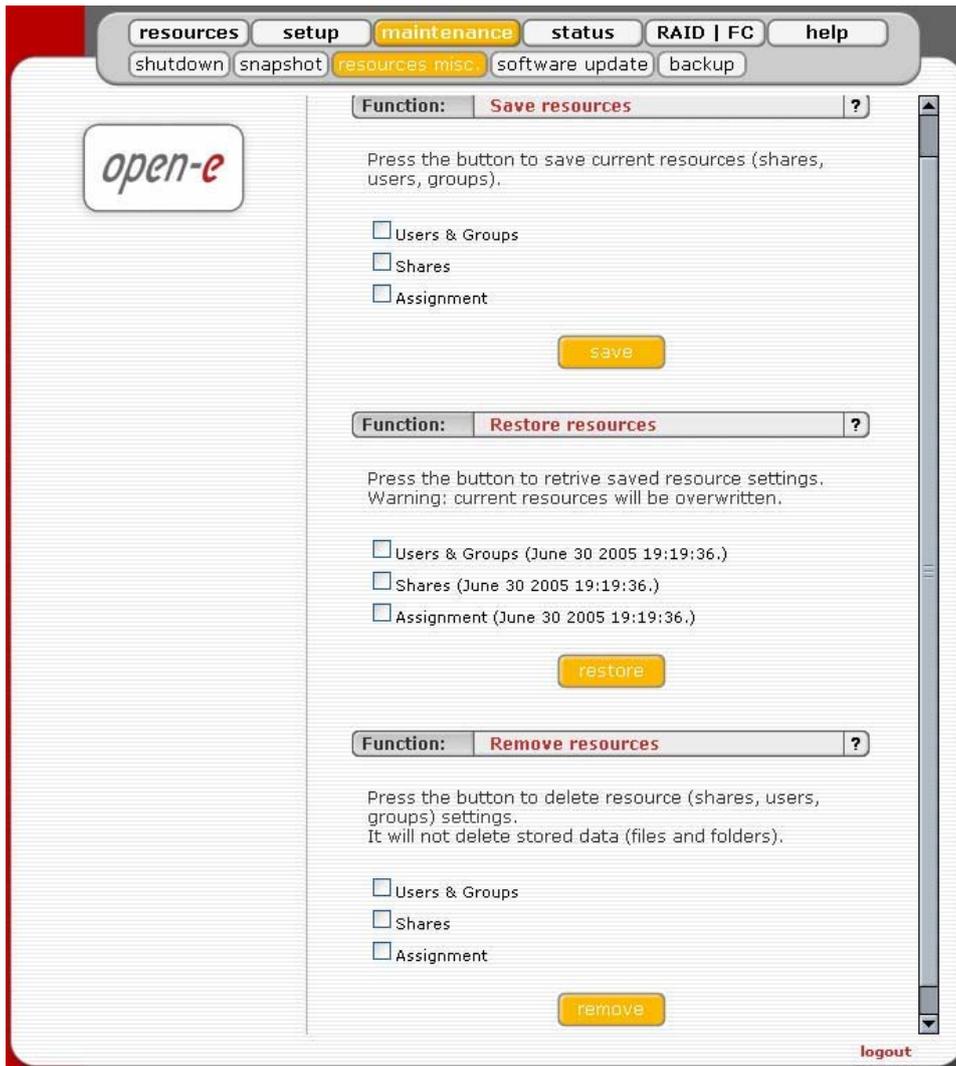
The next menu option is “Miscellaneous Resources.” This function allows you to save shares, users and groups, to retrieve them, and to remove them.

#### Function “Save”

With this function you easily store the settings of your resources.

#### Function “Restore”

With this function you restore your settings.



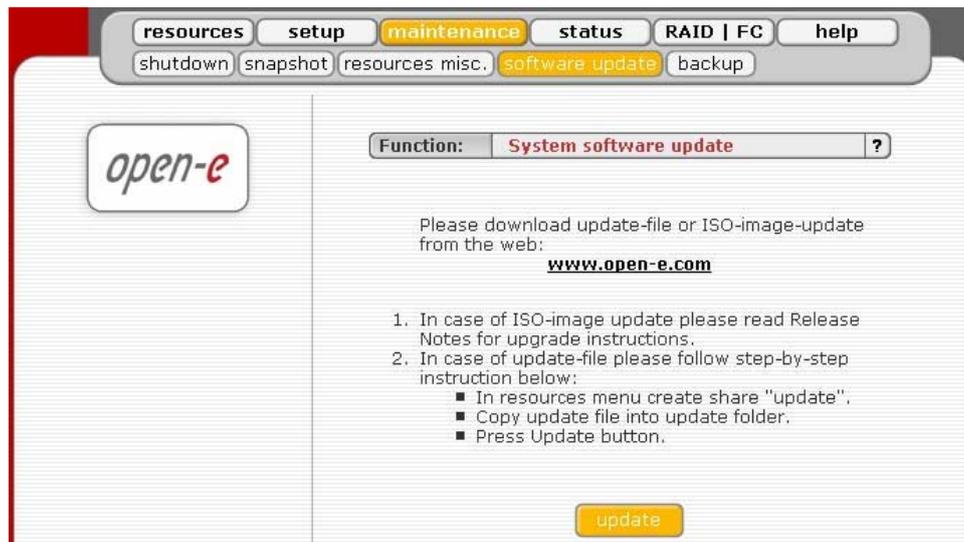
### Function “Remove”

With “Remove Resources” you remove all resources (shares, users and groups). That’s why this function should only be used with extreme caution. At the same time it is important to point out that this function will not delete other data such as your files or folders. After you have selected the remove function you will be prompted to confirm your choice. That is a safety mechanism to ensure you didn’t hit the key by accident.



**Caution:** *The “Remove” button irrevocably deletes all users and resources. Please only use this function if you really want to delete all users and resources, because the data loss cannot be reversed.*

## 5.2.3.4 Software Update



### With ISO-image-update option:

The ISO-Files includes update file which must be burned on a CD with your favorite Burning software (for example: Nero Burning ROM - option: "Burn Image", etc.).

In order to re-flash the module, please install CD-ROM as Secondary-Master and DOM (disk-on-module) as Primary-Master.

Please set the BIOS to boot from CD-ROM drive. Then boot from the ISO-CD and wait until prompt: "Update complete, Please Remove CD and restart" After re-flashing, please reset the BIOS to boot from Primary-master HDD. Updating the system may take about 10 minutes.

Before updating please do:

- write down the actual NAS server IP address and NAS server name. After having updated Open-E NAS, please re-enter both,
- write down authorization settings,
- save "User", "Groups", "Shares" and "Assignments" under Menu: "Maintenance" → "Resources Misc." → "Save resources",
- download and save NAS Server Logs: Menu "Status" → "Hardware" in Function Logs click on "Download", then save on your local HDD.

### With update-file option:

With "Update-file" you can install the most up-to-date version of the Open-E NAS software. Copy the new software to the /update directory of Open-E NAS and then update it. The new version will be installed immediately.



**Notes:** *When you create the share "update" use small characters only!*

### 5.2.3.5 Backup

#### Function “Local backup”

This function allows backing up shares on logical volumes of the Open-e NAS server. Before starting a local backup procedure, you must choose the “source lv”, snapshot, destination and share source. Choosing the “incremental backup” will copy files that have been changed since the last backup or will make a new backup.

Shares included in the right window (see the image below), are automatically backed up by clicking the “apply” button.



**Notes: Choosing Destination: “dynamic” will automatically execute the rescan process and it will take a few seconds to complete.**

#### Function “Local backup schedule”

This function allows you to edit previously saved local backup schedules. There are available 2 types of schedule: weekly and interval.

- **Interval:** Backup will be made every "selected time". E.g. if you choose interval 1 h. - each one hour share will be backed up.
- **Weekly:** Backup will be made in selected days at specified time.

To edit properties of schedule please click at 

To delete schedule please click at 

You can also delete a schedule by setting interval to "not set" or deselecting all days and unset time when using weekly schedule.



**Notes:** *1. It is possible to edit time of backups. If you want to edit shares to backup or other backup options please delete this schedule and add new.*

*2. It is possible to perform one backup at once. If you schedule few backup at the same time, only one will be done.*

### Function “Restore from local backup”

In order to restore shares from a local backup you must set the required parameters like: source lv, backup file and destination share. Choosing the apply function will commence the restore process automatically.

### Function “Tape Backup Function”

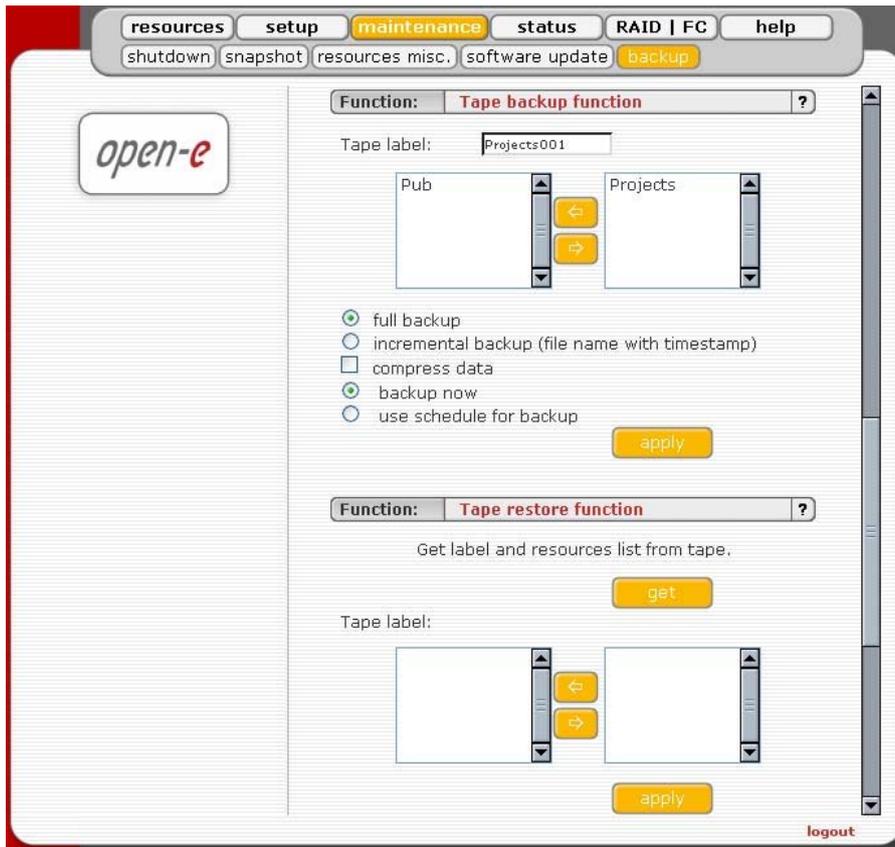
This feature allows logical disks to be added to the Open-E NAS’ tape backup support. However, it will only work when a compatible streamer with a tape inserted is installed.

The shares included in the right window (see the image above) are automatically accounted for when pressing the “apply” button to start the backup procedure. Choosing “incremental backup” will only copy files that have been changed since the last backup.

Try to use tape labels (max. 50 alphanumeric characters), this will considerably help to distinguish your tapes later.

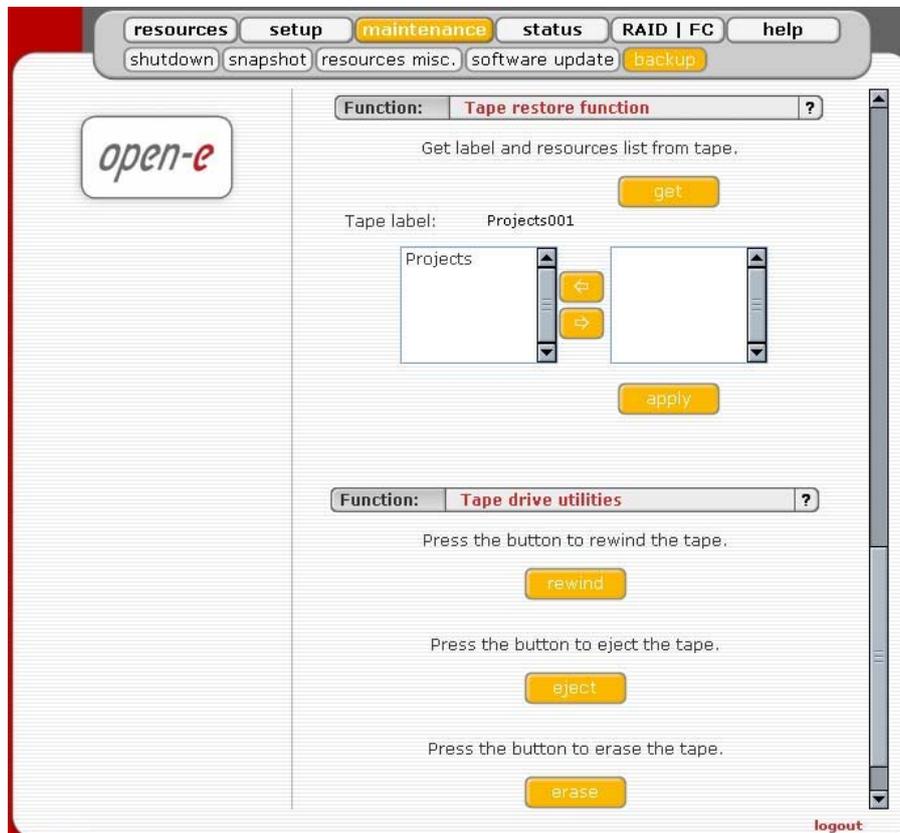
### Function “Tape Restore Function”

Restoring works pretty much like the backup function. Start with providing the streamer tape you want to use for the recovery process, check the shares demanded to be restored and press apply. The restore process will commence automatically right away.



### Function “Tape drive utilities”

This function gives access to various utilities specific to installed tape streamers hardware.



## 5.2.4 Status

This function provides a quick overview of the most important system parameters of your Open-E NAS. The corresponding sub-functions are network, share volume, connections, and hardware.

### 5.2.4.1 Network

This function gives information on the IP address and the NAS date and time.

The screenshot shows the Open-E web interface. At the top, there are navigation tabs: resources, setup, maintenance, status (highlighted), RAID | FC, and help. Below these are sub-function tabs: network (highlighted), share volume, connections, and hardware. The main content area has the 'open-e' logo on the left. The 'Function:' dropdown is set to 'IP address info'. Below it, a dropdown menu shows 'eth0'. The configuration details are as follows:

- Use dhcp: off
- IP: 192.168.1.2
- Netmask: 255.255.255.0
- Broadcast: 192.168.1.255
- Gateway:
- DNS 0: 192.168.1.1

Below this, the 'Function:' dropdown is set to 'NAS date & time', and the 'Current:' time is shown as 2005-10-16 23:33:41.

### 5.2.4.2 Share Volume

This function contains any statistical data on the share volume, dynamic unit statistic and browse, the synchronization status, the local backup and restores status.

The screenshot shows the Open-E web interface. At the top, there are navigation tabs: resources, setup, maintenance, status (highlighted), RAID | FC, and help. Below these are sub-function tabs: network, share volume (highlighted), connections, and hardware. The main content area has the 'open-e' logo on the left. The 'Function:' dropdown is set to 'Share volume statistics'. Below it, a section for 'lv00' shows usage statistics:

Usage: 0 %      0.06 / 100.64 GB      (Free: 100.58 GB)

Total snapshots: 3. In use: 1.

Name	Usage	Created	Status
Snap002	0.08% [6 MB/7.55 GB]	2005-08-01 22:32:56	✓

Below this, the 'Function:' dropdown is set to 'Dynamic unit statistics', showing 'No dynamic unit found.' The next 'Function:' dropdown is set to 'Dynamic unit browse', also showing 'No dynamic unit found.' The 'Function:' dropdown is then set to 'Synchronization status', showing:

- Mode : source
- Destination IP : 192.168.1.3
- Running : Yes
- Destination NAS found.

At the bottom, there are two tables:

<b>Synchronization start</b>	2005.08.01 19:15:28
<b>Synchronization stop</b>	2005.08.01 19:17:16

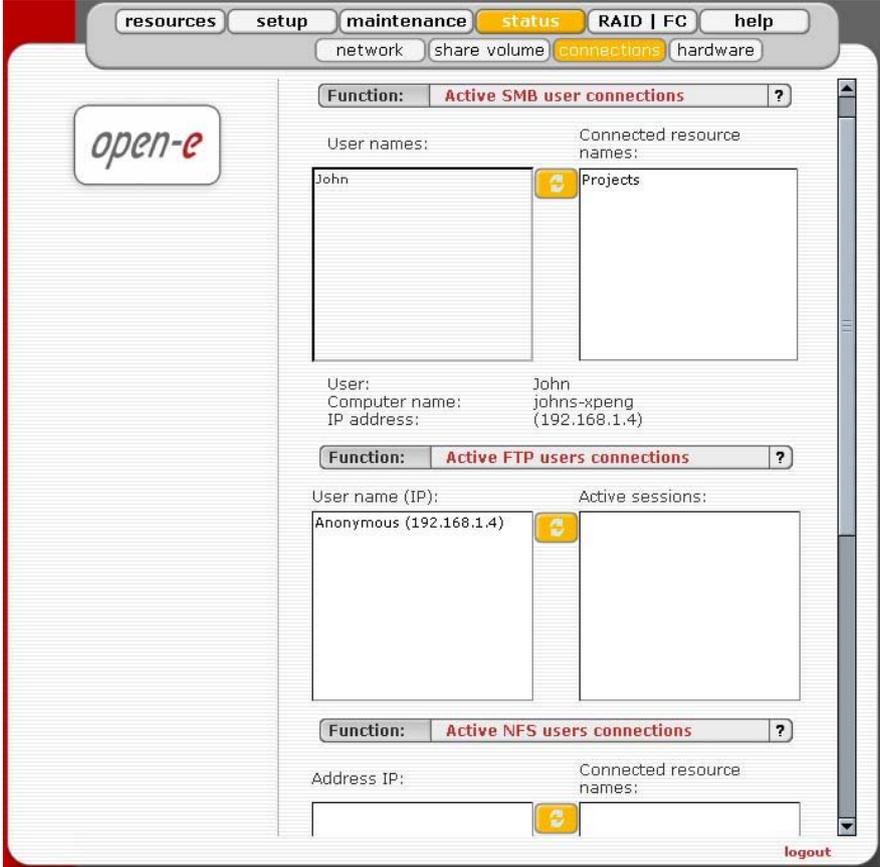
Time	Status
19:15:28	✓ Share:Projects, Success

A 'logout' link is visible at the bottom right of the interface.



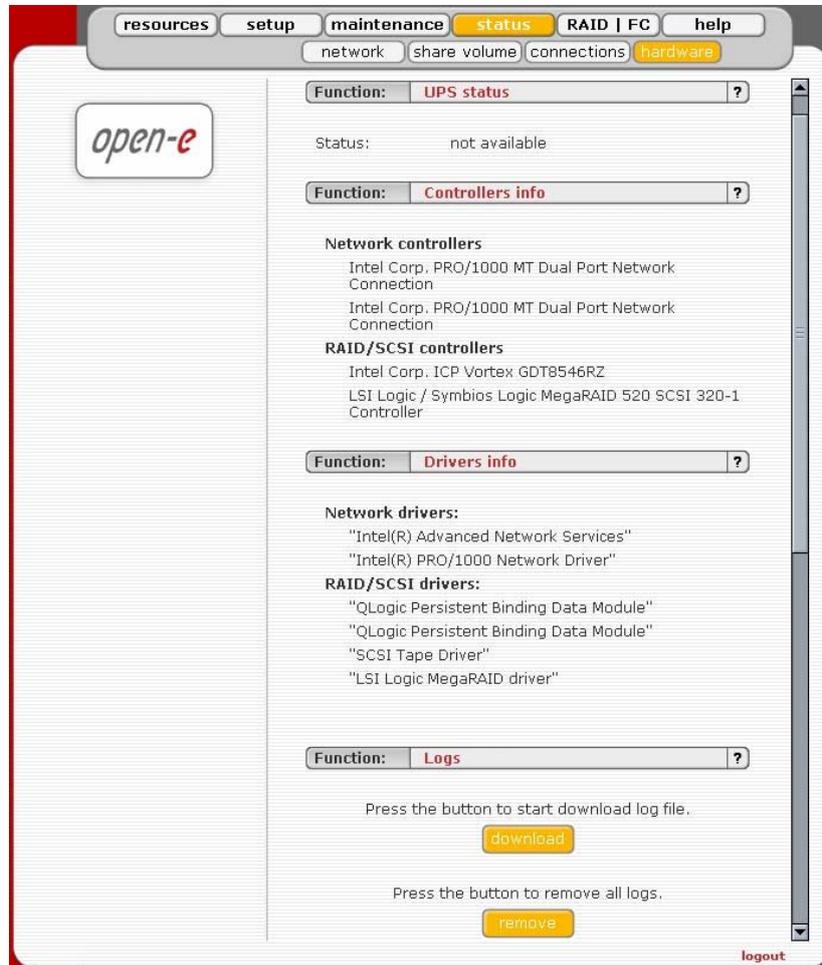
5.2.4.3 Connections

This function displays what user connections are currently active.

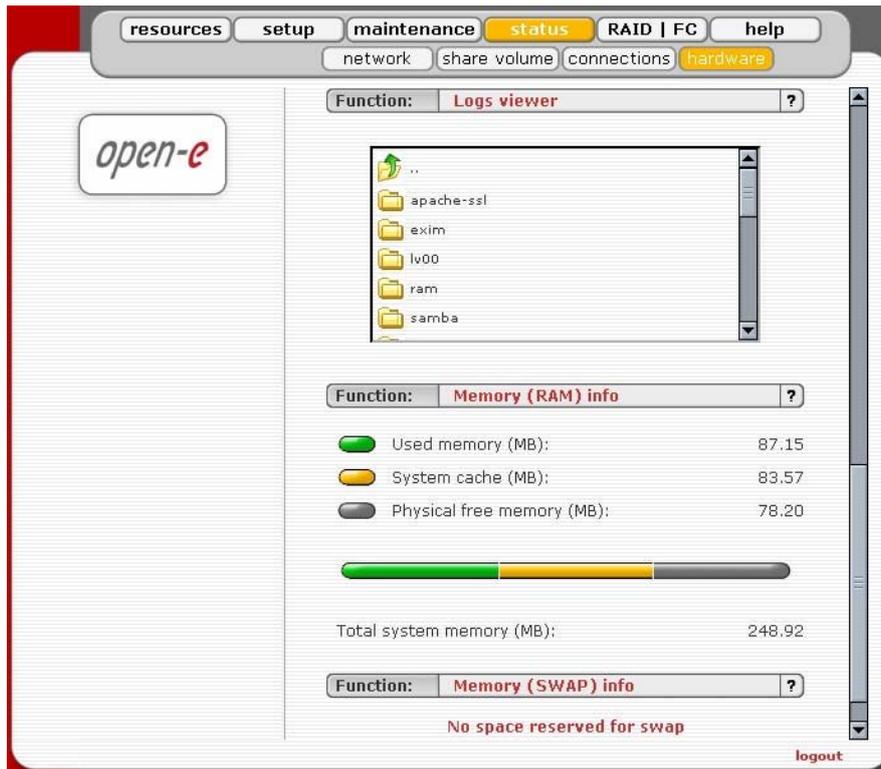


## 5.2.4.4 Hardware

The “Hardware” option provides you with information on storage and network controllers and the drivers (e.g. network driver and RAID driver).



In addition, you may also download the latest Open-E NAS log files, to view specified log file without downloading all log files in compressed form and check memory (RAM) and (SWAP) info usage.



## 5.2.5 RAID



Please note that the RAID controller should be supported by the Open-E NAS software. In case 3ware controller installed, by clicking on RAID in the menu the 3ware web base will be started automatically.

With INTEL / ICP Vortex RAID controllers you can select users that will be allowed to configure the RAID Controller in this menu. Please use the original INTEL/ICP Vortex console utility for this configuration. Example below shows how to choose users with different authentications.

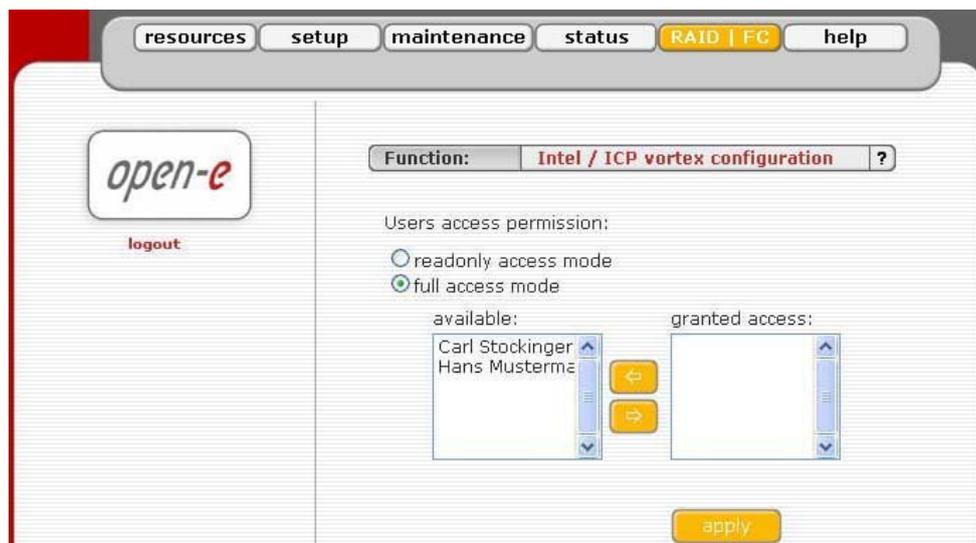
In LDAP users

- a. Create a user in the resources tab
- b. Go to the RAID tab
- c. Set the users access permission:
  - check 'read only' access mode or full access mode
- d. Move selected users from window 'available' to window 'granted access'

- e. Accept it by clicking the apply button
- f. On your local computer run “storcon” application. To get the ICP-VORTEX software go to [http://www.icp-vortex.com/english/download/rz\\_neu\\_e.htm](http://www.icp-vortex.com/english/download/rz_neu_e.htm)
- g. Select the TCP/IP Sockets interface
- h. Set the remote machine IP
- i. Type in the ID and password for each user
- j. Now you have access to the RAID controller tools

**In Microsoft Primary Domain Controller (PDC, ADS) and NIS authentication**

- a. Run storcon application on your local computer. To get the ICP-VORTEX software go to [http://www.icp-vortex.com/english/download/rz\\_neu\\_e.htm](http://www.icp-vortex.com/english/download/rz_neu_e.htm)
- b. Select the TCP/IP Sockets interface
- c. Set the remote machine IP
- d. Set the "raid-admin" and password "admin" for users with a full access or
- e. Set the "raid" and password "raid" for users with a 'read only' access mode
- f. Now you have access to the Intel RAID controller tools

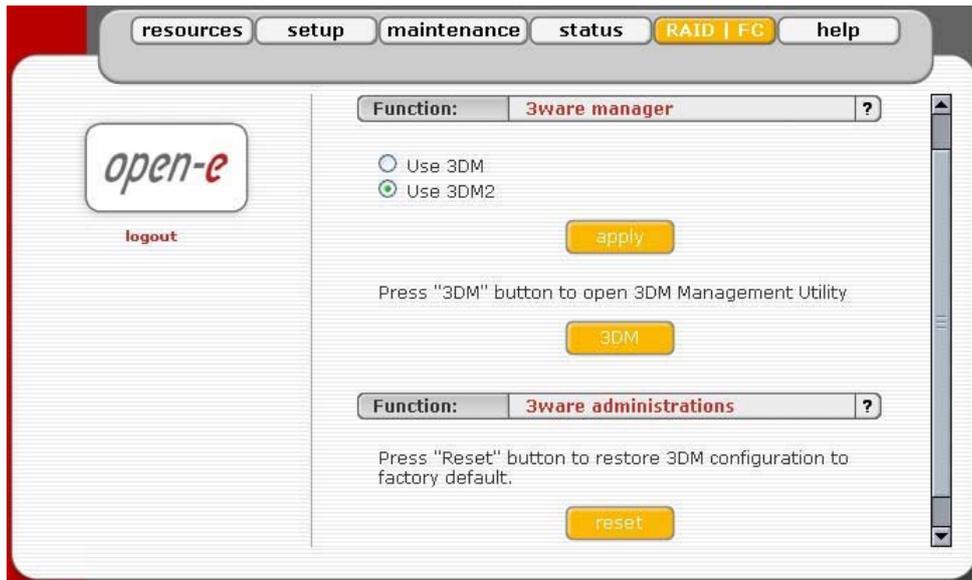


**Function “3ware administrations”**

This function will reset the 3DM password to factory default.  
(Default 3DM/3DM2 password: 3ware)

**Function “3ware manager”**

In case of controller 7000/8000 is installed, you can choose 3ware RAID manager 3DM or 3DM2.

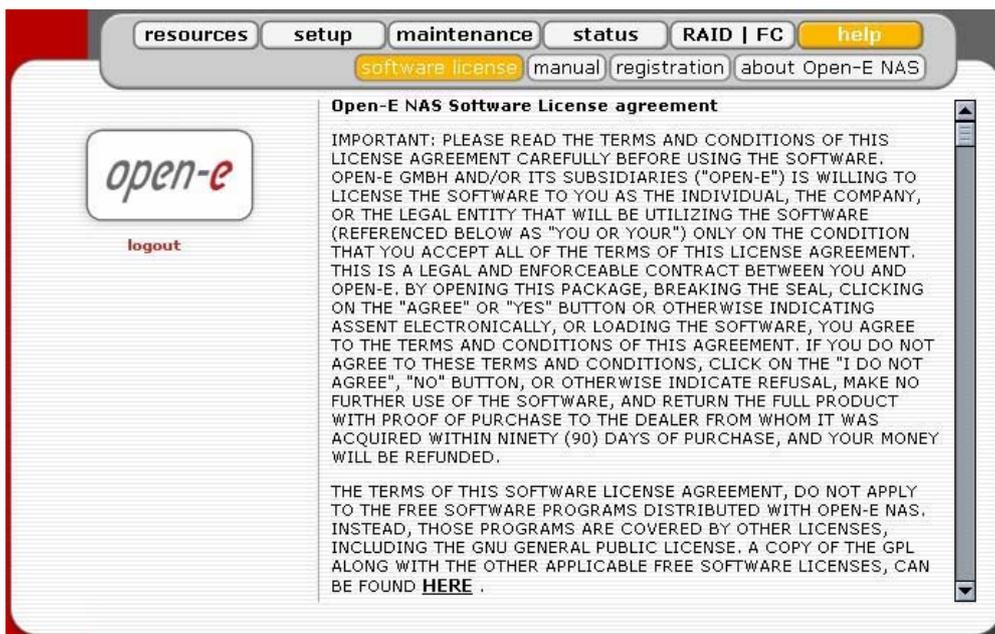


**Notes:** If you choose 3DM2 option for controller 7000/8000, the scheduling tasks will be not supported.

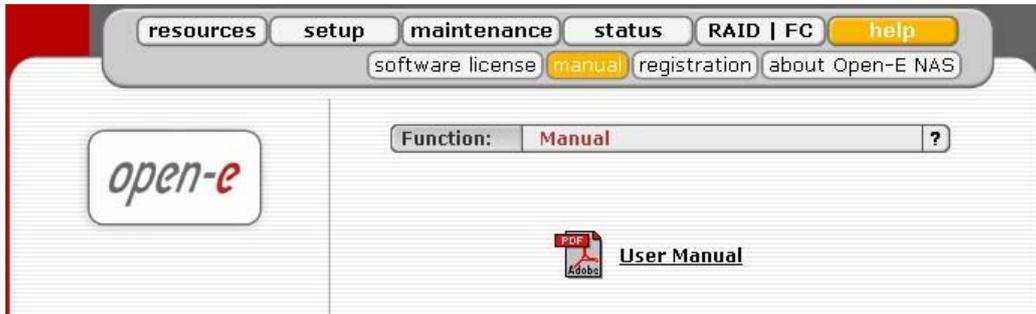
Support remote management is used for 3ware & Intel RAID controllers only. In case of Adaptec & LSI Logic, the RAID Manager is available on the NAS console only. Once LSI RAID is installed you have access to RAID management via hot keys: CTRL+ALT+R and then ENTER. You may press F1 for help to display it on the console screen.

## 5.2.6 Help

When accessing Help - "Software License" you can get acquainted with license for software included in Open-E NAS ENTERPRISE.



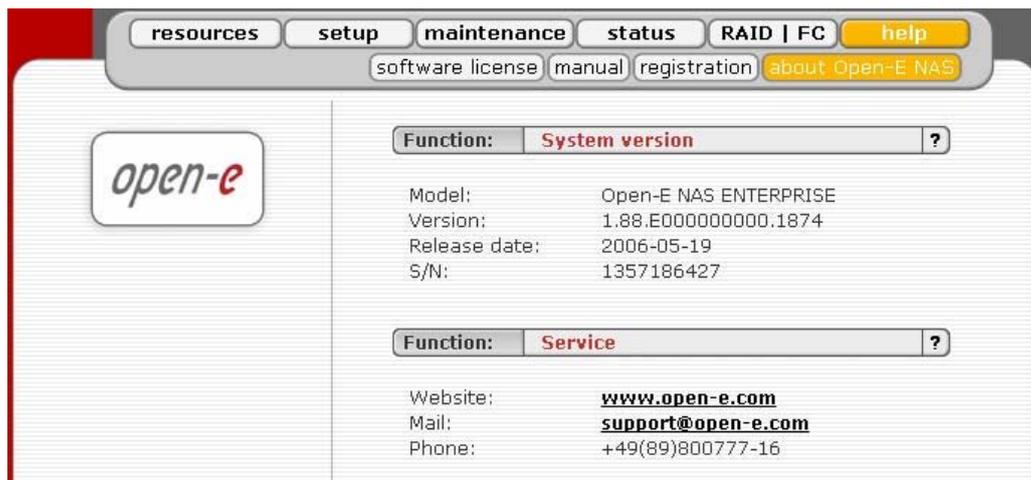
You can download a PDF version of this manual. In order to read the manual, you need a PDF viewer such as the Acrobat Reader (<http://www.adobe.com>).



By clicking on “Registration” in the “Help” menu you can register yourself at <http://www.open-e.com>.



“About Open-E NAS” indicates which system version you are currently working with. In addition you find contact information regarding Open-E NAS; for instance how you can reach Open-E’s technical hotline if you should have problems.



You log out by closing the browser window.

## 6 TROUBLESHOOTING GUIDE

Here is a list of common error messages and their meanings as well as corresponding tips on how to resolve the underlying problem. If your error message is not listed here please contact Open-E's support and service team (see section “help” above). Our staff will help you find a solution.

### **Open-E NAS does not boot, keyboard LEDs are flashing**

This problem arises when you installed Open-E NAS into the secondary IDE slot by mistake. Open-E NAS is configured for and will only run in the primary IDE connector. Shut down the computer, remove Open-E NAS from secondary and place it into primary. That solves the problem. Also, it is important that you use the master plug on your power adapter.

### **Error: user already exists**

There cannot be more than one user with the same name. You cannot create a user twice. Check your spelling. Remember, user names are not case-sensitive. You can check existing user names by expanding the tree diagram on the left.

### **Error: values are not valid**

You have entered an invalid parameter. IP addresses have the form aaa.bbb.ccc.ddd: All four parameters range between 0 and 255 and are always separated by periods.

### **Error: resource already exists**

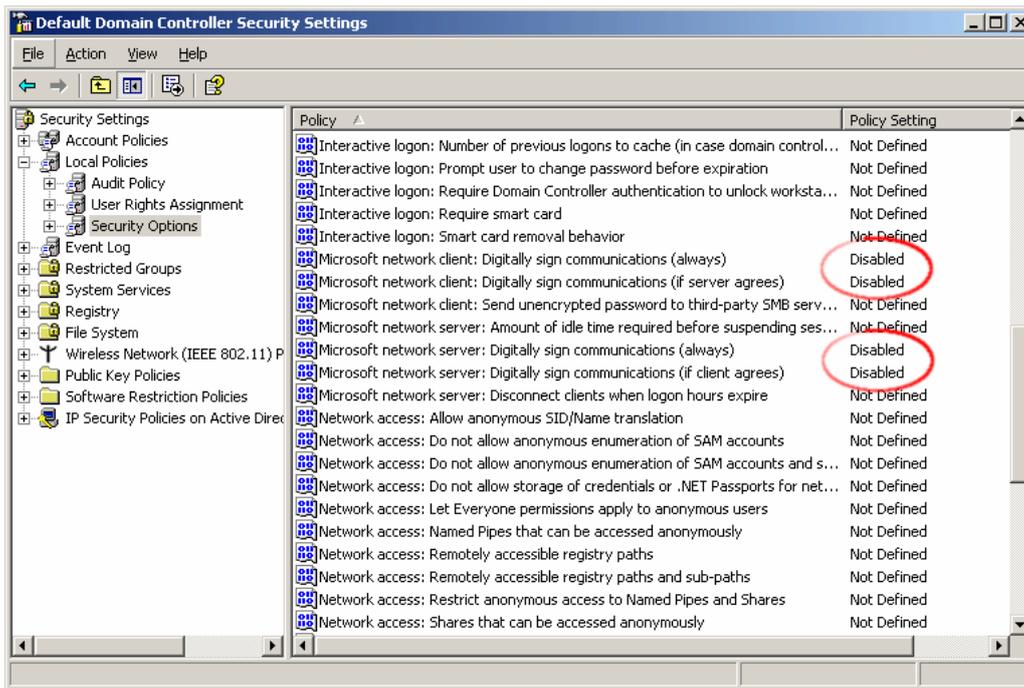
You cannot create more than one resource with the same name. You cannot create a resource twice. Check your spelling. Remember that resource names are not case-sensitive. You can check existing resource names by expanding the tree diagram to the left.

### **Error: passwords do not match**

Make sure that you type the same password in each entry field. For safety reasons, the passwords are not displayed. Type slowly. Check the status of the Shift, Caps Lock, Control, and Alt-keys.

### **Error: Open-E NAS cannot import the user database from a Windows Server 2003 domain.**

In this case the following setting within the local security guideline may solve this problem:



### Error: Update file not found

You instructed Open-E NAS to perform a systems update, but did not supply a valid Open-E NAS ENTERPRISE update file. Download the latest Open-E NAS update file from the [www.open-e.com](http://www.open-e.com) Web site. Next, copy the upgrade file into your "update" folder (please spell upgrade lower case). Finally, select "update" from the menu.

### Error: No share volume

You must create a volume for file sharing before you can create any resource shares or search for shares. Look into the "Getting Started" section of this manual for instructions on creating a share volume.

### Error: No share volume to browse

You must create a volume for file sharing before you can browse it in order to create resource shares.

### Error: Invalid user name!

User name cannot:

- (1) Contain characters: ~ ! @ # \$ ^ & ( ) + [ ] { } \* ; : ' " . , % | < > ? / \ = `
- (2) Begin or end with a space

The use of the SMB (Server Message Block) protocol from Windows, also known as CIFS or Samba, places some restrictions on the use of special characters. These restrictions have historical reasons, but are still binding today. User names must not contain any of the above mentioned characters.

### **Error: invalid user password**

A user password cannot begin or end with a space.

Spaces are not legitimate characters at the beginning and end of a password. Maybe you inadvertently hit the space bar during password entry. Please reenter your password.

### **Error: invalid administrator password**

Administrator password cannot begin or end with a space.

Spaces are not legitimate characters at the beginning and end of a password. Maybe you inadvertently hit the space bar during password entry. Reenter your password.

### **Error: invalid resource name**

Resource name cannot:

- (1) Contain characters: \* : " | < > ? / \ ` # \$ & ( ) + ; ' .
- (2) Begin or end with a space

The use of the SMB (Server Message Block) protocol from Windows, also known as CIFS or Samba, lays some restrictions on the use of special characters. These restrictions have historical reasons, but are still binding today. Resource names cannot contain any of the above mentioned characters. Note that the list of invalid characters is slightly different than that for other name fields.

### **Error: invalid workgroup name**

Workgroup name cannot:

- (1) Contain characters: ~ ! @ # \$ ^ & ( ) + [ ] { } \* ; : ' " . , % | < > ? / \ = `
- (2) Begin or end with a space

The use of the SMB (Server Message Block) protocol from Windows, also known as CIFS or Samba, lays some restrictions on the use of special characters. These restrictions have historical reasons, but are still binding today. Workgroup names cannot contain any of the characters listed above. Note that the list of invalid characters is slightly different than that for other name fields.



**Notes:** *The invalid characters for workgroup names are different than the ones for other fields.*

### **Error: invalid server name**

Server name cannot contain:

- (1) Characters: ~ ! @ # \$ ^ & ( ) + [ ] { } \* ; : ' " . , % | < > ? / \ = `
- (2) Spaces
- (3) Digits only

The use of the SMB (Server Message Block) protocol from Windows, also known as CIFS or Samba, lays some restrictions on the use of special characters. These restrictions have historical reasons, but are still binding today. Server names cannot contain any of the above mentioned characters. Note that the list of invalid characters is slightly different than that for

other name fields. In addition, server names cannot be constructed from numbers only, they must contain alpha characters.

**Error: invalid resource comment**

Resource comment cannot be longer than 256 characters

Resource comments have a limit of 256 characters, a limit which cannot be exceeded. Use a shorter comment.

**Error: invalid directory name**

Directory name cannot:

(1) Contain characters: \* : " | < > ? / \ ` # \$ & ( ) + ; ' .

(2) Begin or end with a space

The internal operating system of Open-E NAS does not allow certain characters to be used for directories. The above mentioned characters are invalid, just as trailing or leading spaces. Choose a different name.

## 7 Appendix A

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## 8 Appendix B

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Version 2, June 1991

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