

USER MANUAL



SILVER STORE 2-DRIVE NAS

NETWORK ATTACHED HARD DRIVE / 3.5" / RAID / GIGABIT LAN / USB 3.0 HOST

Dear user!

Thank you very much for choosing the **SilverStore 2-Drive NAS**. The SilverStore 2-Drive NAS offers you easy-to-use network storage possibilities and the facility of using the device as a DLNA/UPnP media server and as a torrent download client.

Freecom Technologies • Germany
www.freecom.com

Contents of the box

Please check the contents of the box. All articles included in this box are listed on the back side of the packaging.

**Need assistance? Have questions?**

In case you have a question about the use of this product, need information about other Freecom products or need technical assistance, please contact the Freecom Service Center for your country. See www.freecom.com for details.

Freecom offers free unlimited helpdesk support.

**Warning !**

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This device is equipment complying with EN55022 class B.

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We reserve the right to upgrade our products in keeping with technological advances.

Table of Contents

General Information

System requirements.....	Page	4
Precautionary measures.....	Page	5
Introduction.....	Page	6

Chapter

Hardware Installation	Page	8
-----------------------------	------	---

Chapter

Installation of the application software (FNSA)	Page	11
---	------	----

Chapter

Getting Started	Page	18
-----------------------	------	----

Chapter

Navigating the SilverStore Web-based Utility	Page	21
--	------	----

Chapter

Tonido Remote Access	Page	68
----------------------------	------	----

Chapter

Troubleshooting.....	Page	82
Appendix A: CE, FCC and other certifications.....	Page	82
Appendix B: Preparing LAN for use with the SilverStore..	Page	83
Appendix C: Network Basics.....	Page	85

General Information

Your system needs to meet the following hardware and software requirements for the device to function properly.

System requirements

To use the SilverStore 2-Drive NAS, you will require the following components:

PC:

- Intel Pentium III / AMD Duron 900 MHz or higher
- 256 MB RAM (Vista / 7: 512 MB RAM) or higher
- LAN (1000Base-T full duplex connection recommended)
- CD-ROM drive
- Internet connection for online warranty registration, software updates and downloads
- Operating system: Windows XP, Windows Vista, Windows 7

Mac:

- PowerPC G4/G5 or Intel Mac
- 256 MB RAM or higher
- LAN (1000Base-T full duplex connection recommended)
- CD-ROM drive
- Internet connection for online warranty registration, software updates and downloads
- Operating system: Mac OS X v10.4 or higher

If you have bought the SilverStore 2-Drive NAS as a kit (no HDD delivered) we advise you to use 2 Disks. In order to enable immediate use, your SilverStore 2-Drive NAS is pre-formatted and configured as RAID 0. You therefore have the maximum storage space available. If you value maximum data security, we recommend the configuration as RAID 1. In the "RAID 1" mode, your hard disks will be mirrored, so that only half the maximum storage space will be available. If one hard disk fails, your data can then be restored from the second hard disk. Further information on hard disk configuration can be found in the "Storage" section of this manual.

Precautionary measures

To ensure that your SilverStore 2-Drive NAS functions properly, please take note of the following precautions. If these are not followed, you may void your warranty and damage the SilverStore 2-Drive NAS.

- Do not drop the SilverStore 2-Drive NAS or expose it to other kinds of sudden mechanical shocks as this may result in data loss and damage to the SilverStore 2-Drive NAS.
- Do not use the SilverStore 2-Drive NAS when the ambient temperature is below 10°C or above 35°C.
- If the SilverStore 2-Drive NAS is moved from a cool environment to a warmer environment, please allow the drive to acclimatize to the ambient temperature before operating the device. Failing to do so may lead to condensation within the drive enclosure, which in turn may cause the drive to malfunction.
- Do not place liquids or drinks on the SilverStore 2-Drive NAS. When liquids are spilled and get in contact with the electronics within the drive enclosure, it will damage the drive and will cause the drive to malfunction.
- Do not use the SilverStore 2-Drive NAS in a dusty environment. Dust inside the enclosure may damage the internal electronics and result in drive malfunction.
- Only use the power adapter that was supplied with the SilverStore 2-Drive NAS.
- Opening the SilverStore 2-Drive NAS will void the warranty.



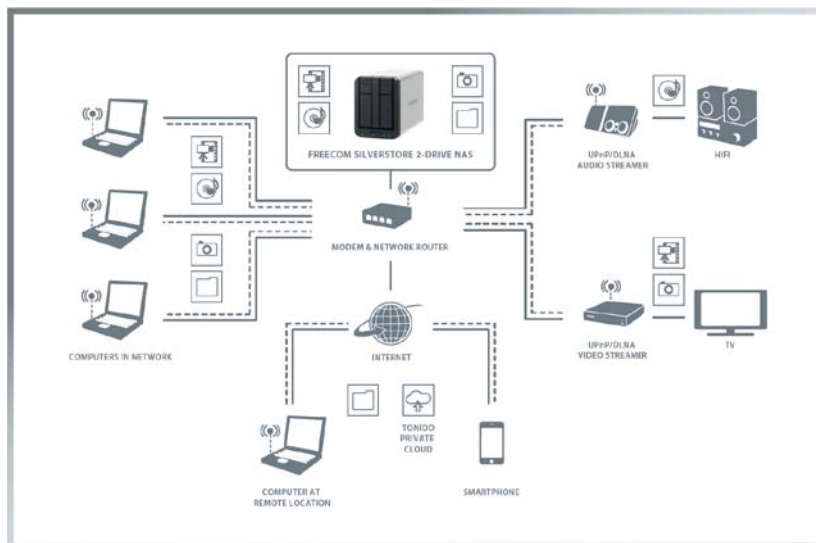
If at any point during installing and/or configuring your SilverStore 2-Drive NAS you need assistance or have questions, please contact the Freecom Support Center for your country. See www.freecom.com for details.

Freecom offers free unlimited helpdesk support.

Introduction

The SilverStore storage appliance includes a web-based utility that can be accessed through a web browser from any computer on your network. Administrators can efficiently manage and monitor the SilverStore's hardware components, health and performance.

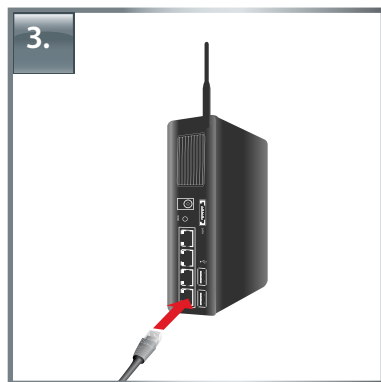
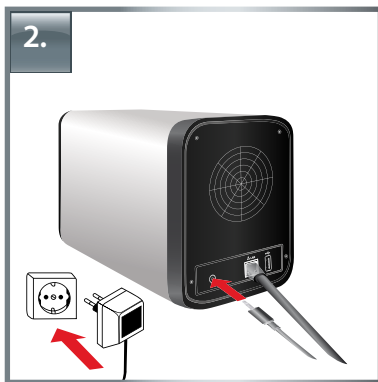
SilverStore 2-Drive NAS – Setup overview



Features

- Remote access
SilverStore supports remote access via a web-based utility, enabling management from anywhere in the network.
- Secured access
SilverStore can be accessed with password protected, SSL (SSL - Secure Socket Layer) encrypted web utility.
- Email notification
Administrators are automatically alerted by email, in the event of warnings or errors related to temperatures, fan speeds, hard drive, network, USB occurred in the SilverStore.
- Multiple management levels
Users can be assigned different access permissions. SilverStore supports two levels: full access and read only.
- Update via web
Administrators can run remote firmware updates on the SilverStore.
- Disk management
Administrators can use the web-based utility to monitor internal and external USB hard drives.
- SMART support
Includes SMART (Smart Monitoring Analysis and Reporting Technology) feature for monitoring SATA hard drive health status.
- USB storage support
Supports data backup to an external USB hard drive.
- Support for volume sharing
Allows file sharing (such as documents, photos, music, or videos) with other computers on a network.

Chapter: Hardware Installation



1. Plug the LAN cable into the SilverStore 2-Drive NAS.
2. Insert the power cord into the SilverStore 2-Drive NAS and plug the power supply into the socket.
3. Connect the other end of the LAN cable to a network router.
Please note: Your router must be configured as a DHCP server. Further information on setting up the DHCP server function of your router can be found in the manual of your router.
4. Switch on the SilverStore 2-Drive NAS before using it.

Tray remove / insertion



1. Push down Eject button and open tray handle max. 45°!
2. Encompass the tray handle! Fix device location by other hand and pull out the tray!
3. Insert tray with open tray handle into the slot! Push tray with thumb totally into the device!
4. Close tray handle!



Handle with care!

LED Description

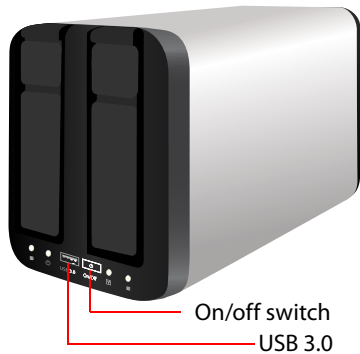
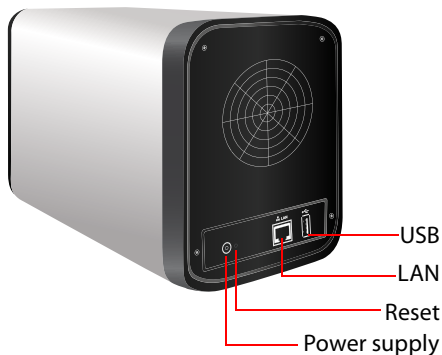
LED		On	Flashing	Red	Off
1	HDD 1	HDD formatted	Data access	HDD unformatted	x
2	Power	Device on	x	x	Device off
3	Activity	x	e.g. Upgrade/ boot/shut down	System fault	Normal mode
4	HDD 2	HDD formatted	Data access	HDD unformatted	x



LEDs

Power switch

The SilverStore is designed to work 24/7 but to conserve electricity and extend the life of the device we advise to turn the SilverStore 2-Drive NAS off when it will not be used for a longer time period.



Chapter: Installation of the application software (FNSA)

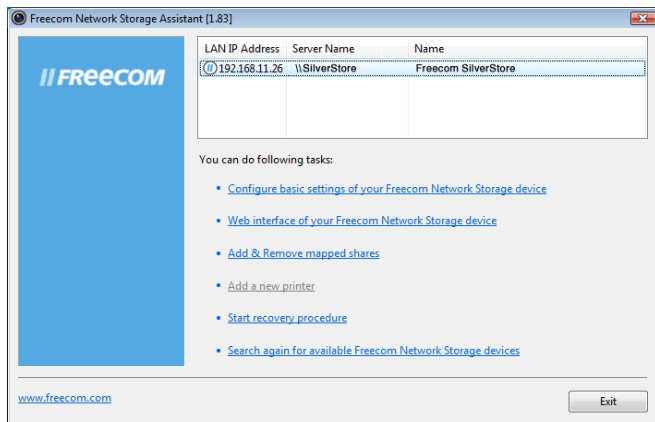
Installation of the Freecom Network Storage Assistant Software (PC)

The Freecom Network Storage Assistant quickly detects and performs the basic setup of your SilverStore 2-Drive NAS. When you start it, it displays all Freecom Network devices available in your network and helps you creating network folders.

1. Please insert the Manual & Application CD into your CD/DVD drive. It contains user manuals and software, including the Freecom Network Storage Assistant. Once the CD is inserted, a window should appear automatically on the screen. If this does not happen, please proceed as follows:
2. Open "My Computer".
3. Double-click the CD drive containing the CD. The CD window should now open.



4. Click on "Software Installation" -> "FNS Assistant". The installation starts now. Follow the instructions on the screen, confirm with "Next" in order to continue with the installation. After installation has finished, press "Quit" to exit the menu screen.
5. Start the Freecom Network Storage Assistant by clicking on the "FNSA" icon on your desktop or via "Start" -> "Program files".
6. Check the Freecom Network Storage Assistant whether your SilverStore 2-Drive NAS was detected. This may take some time. If your SilverStore 2-Drive NAS is not immediately detected, click "Search again for available Freecom Network Storage devices" to repeat the search.



7. For a detailed functional description on the Freecom Network Storage Assistant, please refer to chapter "Features of the Freecom Network Storage Assistant (PC)".

Installation of the Freecom Network Storage Assistant Software (Mac)

The Freecom Network Storage Assistant quickly detects and performs the basic setup of your SilverStore 2-Drive NAS. When you start it, it displays all Freecom Network devices available in your network and helps you creating network folders.

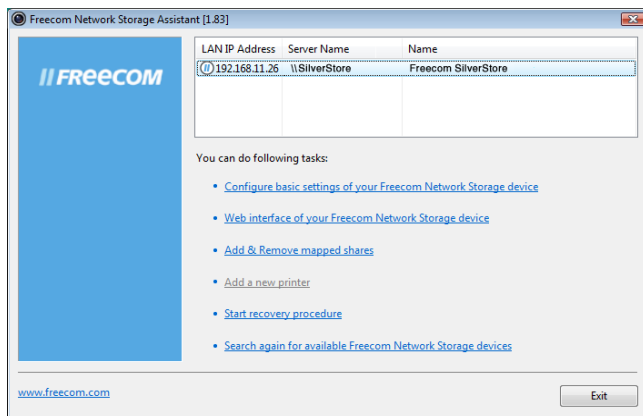
1. Please insert the Manual & Application CD into your CD/DVD drive. It contains user manuals and software, including the Freecom Network Storage Assistant.
2. You will now see CD icon on your Mac desktop.
3. Double-click on the CD icon. Click "Start". The CD window should now open.



4. Click on "Software Installation" -> "FNS Assistant". The installation starts now. Follow the instructions on the screen, confirm with "Next" in order to continue with the installation. After installation has finished, press "Quit" to exit the menu screen.
5. Start the Freecom Network Storage Assistant. This can be found in "Applications" -> "Utilities".
6. Check the Freecom Network Storage Assistant whether your SilverStore 2-Drive NAS was detected. This may take some time. If your SilverStore 2-Drive NAS is not immediately detected, click "Search again for available Freecom Network Storage devices" to repeat the search.
7. For a detailed functional description on the Freecom Network Storage Assistant, please refer to chapter "Features of the Freecom Network Storage Assistant (Mac)"

Features of the Freecom Network Storage Assistant (PC)

The Freecom Network Storage Assistant helps you to locate each SilverStore 2-Drive NAS in your network. When started, it displays all SilverStore 2-Drive NAS available in your network and helps you to create network folders. You may also perform any of the functions of the Freecom Network Storage Assistant manually.



The preset password and login name for the SilverStore 2-Drive NAS are:

Login Name: admin

Password: admin

Configure basic settings of your Freecom Network Storage Device

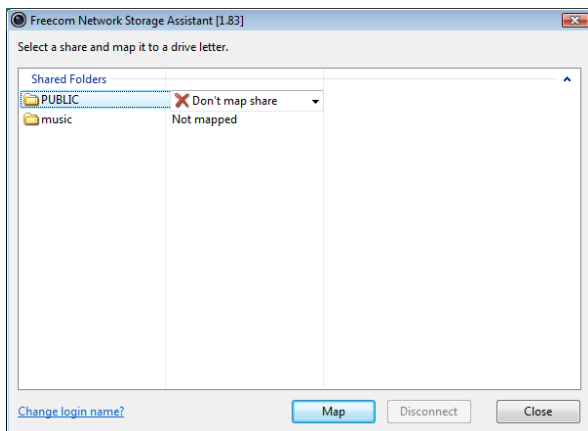
In this screen, you can set an IP address, subnet mask, device name and workgroup name for your SilverStore 2-Drive NAS. With this information, it is easy to locate your SilverStore 2-Drive NAS in the network without the FNSA. To change the settings, you have to enter the administrator password.

Web interface of your Freecom Network Storage Device

When you click this menu item, the web interface for your SilverStore 2-Drive NAS opens in your default browser.

Add and remove mapped shares

You can assign a drive letter to shared folders on your SilverStore 2-Drive NAS. This allows you to access files in Windows more quickly.



Start recovery procedure

This procedure can reset and repair a SilverStore 2-Drive NAS to factory default settings if you cannot access your SilverStore 2-Drive NAS anymore.

To restore your settings, please proceed as follows:

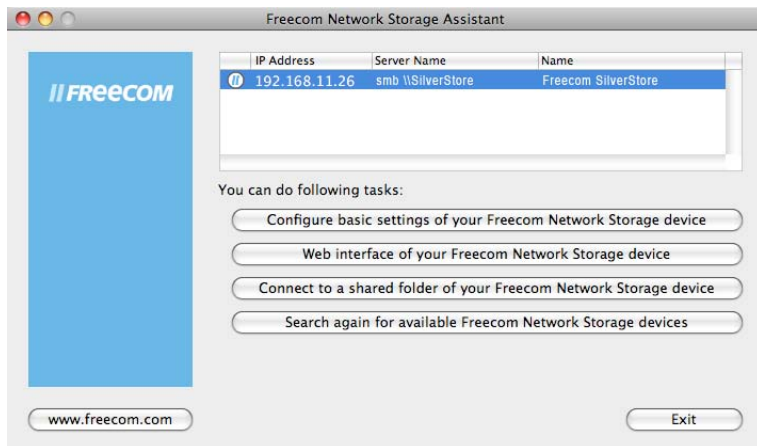
- Enable the Recovery mode by clicking 'Start the recovery procedure' in the Freecom Network Storage Assistant.
- Turn the SilverStore 2-Drive NAS off.
- Use a pointed object to carefully press the 'Reset' button. It is located next to the AC power slot on the back of the SilverStore 2-Drive NAS.
- Keep the 'Reset' button pressed down and turn device on again.
- Wait until white LED goes off (ca. 1 second), then release the 'Reset' button.

Search again for available Freecom Network devices

Click here to repeat the search for your SilverStore 2-Drive NAS if it was not detected during the first search. Please make sure that your network is configured as described above in this manual and that all cables are properly attached.

Features of the Freecom Network Storage Assistant (Mac)

The Freecom Network Storage Assistant helps you to locate each SilverStore 2-Drive NAS in your network. When started, it displays all SilverStore 2-Drive NAS available in your network and helps you configure the SilverStore 2-Drive NAS and that create network folders. You may also perform any of the functions of the Freecom Network Storage Assistant manually.



The preset password and login name for the SilverStore 2-Drive NAS are:

Login Name: admin

Password: admin

Configure basic settings of your Freecom Network Storage device

In this screen, you can set an IP address, subnet mask, device name and workgroup name for your SilverStore 2-Drive NAS. With this information, it is easy to locate your SilverStore 2-Drive NAS in the network without the wizard. To change the settings, you have to enter the administrator password.

Web interface of your Freecom Network Storage device

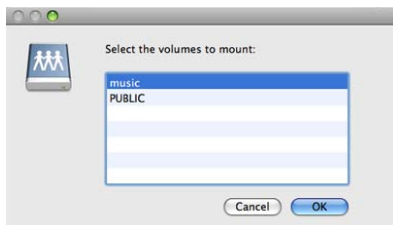
When you click this menu item, the web interface for your SilverStore 2-Drive NAS opens in your default browser.

Connect to a shared folder of your Freecom Network Storage device

This window allows you to mount any folder of your SilverStore 2-Drive NAS on your Mac. This allows fast access to this folder.



Mac OS X 10.4



Mac OS X 10.5/10.6

Search again for available Freecom Network Storage devices

Click here to repeat the search for your SilverStore 2-Drive NAS if it was not detected during the first search. Please make sure that your network is configured as described above in this manual and that all cables are properly attached.

Chapter: Getting Started

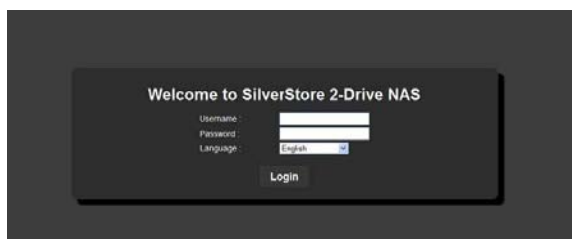
Below include instructions for launching the web-based utility's login page using Windows, Mac, or Linux.

Accessing the Web-based Utility Using Windows

You have two options to launch the login page - using an internet browser or the Windows taskbar. The Web-based utility allows administrators to remotely configure related hardware, network, storage, access control, and status settings for the SilverStore storage appliance.

To access the web-based utility:

1. Ensure that the SilverStore is powered on and connected to your network.
2. Open your Internet browser (e.g. Explorer, Firefox)
3. In the Address bar, type the SilverStore's IP address, then press Enter.



4. Type in the default user name and password.

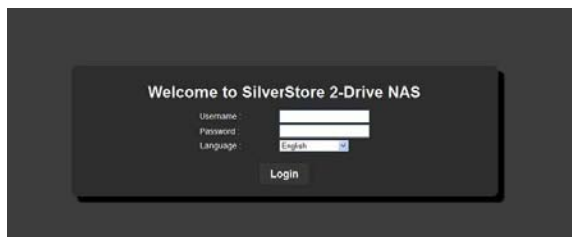
NOTE: The default user name and password is admin. Both user name and password are case sensitive and should be entered exactly in the same way each time.

5. Click Login.

Accessing the Web-based Utility Using Mac OS X

To access the web-based utility:

1. Ensure that the SilverStore is powered on and connected to your network.
2. Launch the Internet Web browser.
3. In the Address box, type the SilverStore's IP address, then press Enter.



4. Type in the default user name and password.

NOTE: The default user name and password is admin. Both user name and password are case sensitive and should be entered exactly in the same way each time.

5. Click Login.

Accessing the Web-based Utility Using Linux

To access the web-based utility:

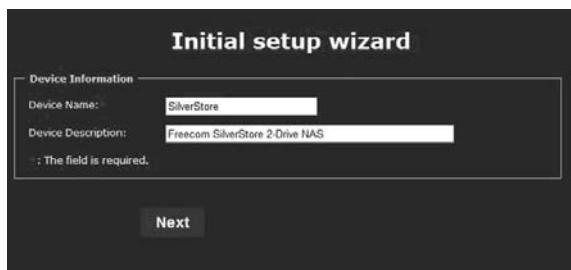
1. Ensure that the SilverStore is powered on and connected to your network.
2. Launch the internet web browser.
3. In the Address box, type the SilverStore's IP address, then press Enter.
4. Type in the default user name and password.

NOTE: The default user name and password is admin.

5. Click Login.

SilverStore - Initial setup wizard

After logging in to the SilverStore web interface for the first time, the “Initial setup wizard” will open:



The „Initial setup wizard” offers the configuration of the basic settings required for the operation of your Freecom SilverStore. These are:

Device Information:

Change name and description of your SilverStore.

Network:

IP Address (Obtain IP address automatically)

Your Freecom SilverStore will get an IP address automatically assigned from your router.

IP Address (manual configuration)

When unchecking the box “Obtain IP address automatically”, you will be able to manually configure the network settings of your Freecom SilverStore.

Time Zone (automatic)

Select your time zone and the option if you want to use an NTP time server for automatic configuration of date and time or if you want to use manual date and time setting.

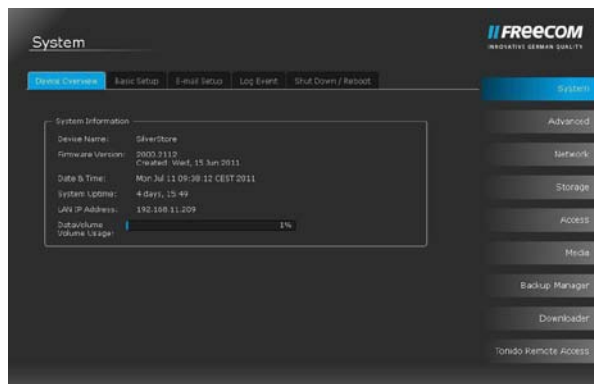
Admin Password

For security reasons, change your admin password here. We recommend using a password with minimum 8 characters length.

After finishing the “Initial setup wizard”, you can login again to your Freecom SilverStore.

Chapter: Navigating the SilverStore Web-based Utility

The web-based utility is designed to logically access and manage the features of the SilverStore. After logging onto the web-based utility, the System Information page appears.



The web GUI (graphical user interface) is divided into two areas. On the left is the information pane, which displays list of information, commands or configuration options that are associated with the category selected from the navigation menu bar. On the right is a multi-level navigation menu bar, which is divided into nine categories and each category is subdivided into several submenus which will appear as tabs on the information pane (For example, on the screen above the Network menu includes five tabs: Device Overview, Basic Setup, E-mail Setup, Log Event and Shut Down/Reboot.).

The navigation menu bar includes the following menus:

- **System** - The System menu contains basic system information. It also provides options for setting the device name, time zone, date and time, email notifications, and performing remote system shutdown or reboot. For more details, see "Using the System Menu".
- **Advanced** - The Advanced menu allows you to change the login password, upgrade the SilverStore firmware, backup the SilverStore system configuration information, restore system to factory defaults, enable the file system checking features, check the hard drives for bad blocks. For more details, see "Using the Advanced Menu".
- **Network** - The Network menu has access to all network configuration options, such as setting up DHCP / Static IP address, network services (i.e., SMB, FTP, NFS, Apple network), and configuring membership in a domain or workgroup. For more details, see "Using the Network Menu".

- **Storage** - The Storage menu displays the number of hard drives installed on the SilverStore and basic hard drive(s) information (such as model name, size, and status). It also includes services for volume management, iSCSI device management, and shared folder management, and allows you to view detailed USB storage device information and hard disk drive quota settings. For more details, see "Using the Storage Menu".
- **Access** - The Access menu allows you to add, modify or remove users and groups, set user or group permissions (read/write, read only, no access) on a shared folder or USB storage devices. For more details, see "Using the Access Menu".
- **Media** - The Media menu allows you to enable Media Server function to make media contents (such as digital photos, videos and music) stored on the SilverStore available for shared access and enable streaming service into iTunes. For more details, see "Using the Media Menu".
- **Backup Manager** - The Backup Manager menu allows you to back up data from a USB storage device to the SilverStore, back up data saved on the SilverStore to a USB storage device, back up data from one SilverStore to another, or back up data volume on the SilverStore. For more details, see "Using the Backup Manager Menu".
- **Downloader** - The Downloader menu allows you to view, manage, boost download speed, and organize file downloads. For more details, see "Using the Downloader Menu".

Tonido Remote Access

Tonido Remote Access offers the possibility of sharing files via the internet. It is possible to allow access for defined users to selected files and folders by using an URL like <http://xxx.freecomnas.com> (where xxx is the name you defined while configuring Tonido Remote Access). User can access either via PC/Mac or by using a Mobile Phone. Mobile Phone applications are available for iPhone/iPad, Android, Windows Phone and Blackberry.

The Tonido service to access your NAS remotely 24/7 is provided free of charge. No subscriptions are necessary to enable this feature.

Using the System Menu

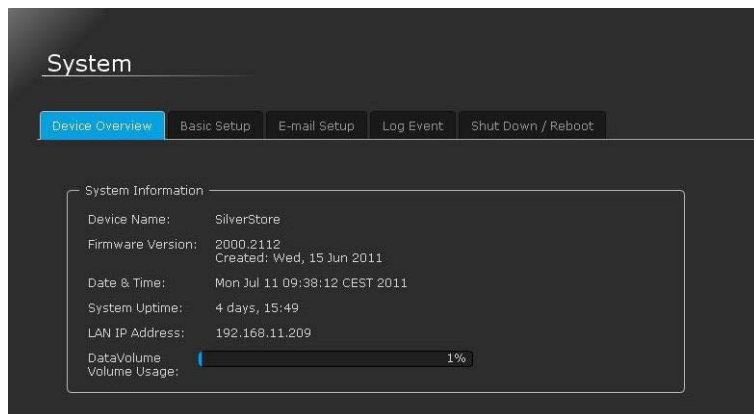
The System menu contains basic information for the SilverStore. Use this menu to set the device name, time zone, date and time, email notifications, and remote shutdown or remote reboot the SilverStore.

The System menu provides access to the following configuration options:

- Device Overview
- Basic Setup
- E-mail Setup
- Log Event
- Shut Down/Reboot

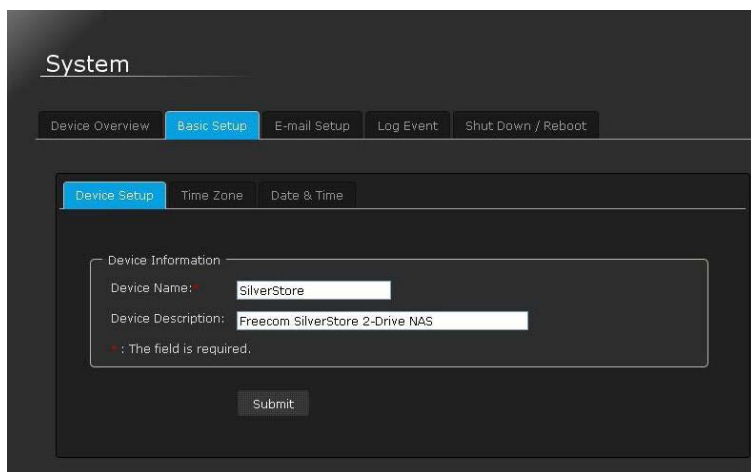
Device Overview

Use the Device Overview tab to view basic system information, such as device name, firmware version, current system date/time, system uptime, and LAN IP address.



Basic Setup

Use the Basic Setup tab to configure basic device settings, such as set the device name, enter a device description, configure the time zone, and set date and time for the SilverStore.



The screenshot shows the 'System' configuration page. At the top, there are tabs: 'Device Overview', 'Basic Setup' (which is selected), 'E-mail Setup', 'Log Event', and 'Shut Down / Reboot'. Below these, there are sub-tabs: 'Device Setup' (selected), 'Time Zone', and 'Date & Time'. The 'Device Setup' section contains a 'Device Information' box with two input fields: 'Device Name' (containing 'SilverStore') and 'Device Description' (containing 'Freecom SilverStore 2-Drive NAS'). A red asterisk and the text ': The field is required.' are shown below the 'Device Name' field. A 'Submit' button is located at the bottom of the 'Device Information' box.

To configure the SilverStore settings:

1. Click the Device Setup tab.
2. In the Device Name field, enter a name for the SilverStore. The name can contain up to 15 characters, including alphabetic, numeric, underscore, space, and most special characters.

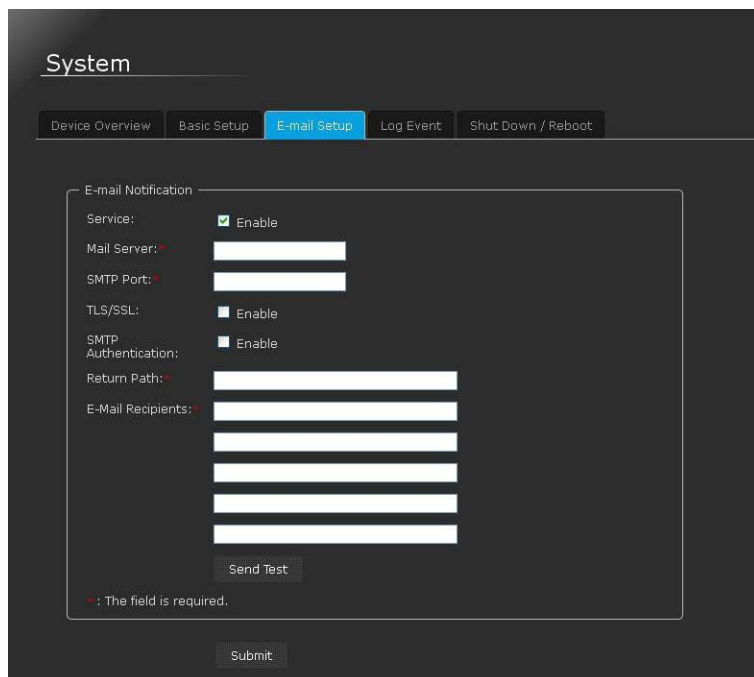
NOTE: The default device name is: SilverStore. The device name is used to identify the SilverStore storage appliance connected to the network. After setting the device name, it will appear in the My Network Places on your computer (My Network Places/Entire Network/Microsoft Windows Network/[Workgroup Name]/[Device Name], where [Device Name] is the name of the SilverStore storage appliance).

To connect to multiple SilverStore on the same network, make sure to specify a unique device name for each system. Renaming a SilverStore will force all your network computers to remap their shared network resources. Change name only when necessary.

3. In the Device Description box, enter a brief device description. The maximum length of the description must not be more than 256 alphanumeric characters.
4. Click the Time Zone tab, then set the time zone for your location.
5. Click the Date & Time tab, then set the system date and time. To make the SilverStore synchronize with an NTP (Network Time Protocol) server, select the Enable check box in NTP Service, then enter the network time server's IP address.
6. Click Submit.

E-mail Setup

Use the E-mail Setup tab to configure the SilverStore utility to send email notifications in the event of warning or errors related to the fan, temperature, hard drive, volume, network, USB, user and group occurred on the SilverStore.



System

Device Overview Basic Setup **E-mail Setup** Log Event Shut Down / Reboot

E-mail Notification

Service: ☒ Enable

Mail Server:

SMTP Port:

TLS/SSL: ☐ Enable

SMTP Authentication: ☐ Enable

Return Path:

E-Mail Recipients:

✖: The field is required.

To setup email notifications:

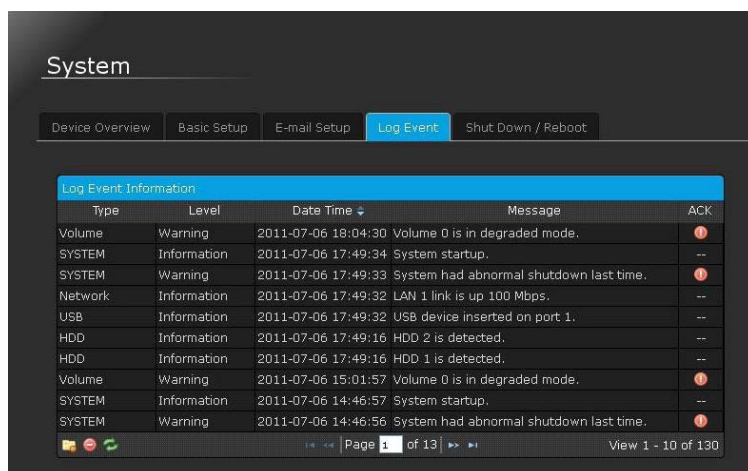
1. Click the E-mail Setup tab.
2. Click the Enable check box next to the Service menu items.

3. In the Mail Server box, enter the SMTP server name or an IP address to be used for sending email.
4. In the SMTP port box, enter the SMTP port number for outgoing mail.
5. If TLS/SSL is required on email clients, select the Enable check box.
6. If SMTP authentication is required, click the Enable check box, then enter the user name and password.
7. In the Email Recipients box, enter the email address for the notification recipient. Up to five email addresses can be added at a time.
8. Click Send Test Mail to send a test alert and confirm your settings are correct.
9. Click Submit.

Log Event

Use the Log Event tab to get an overview of all events that were logged by the system.

In the lower left corner, you have the options to delete all log files older than 7 days, to delete all log files and to refresh the view.

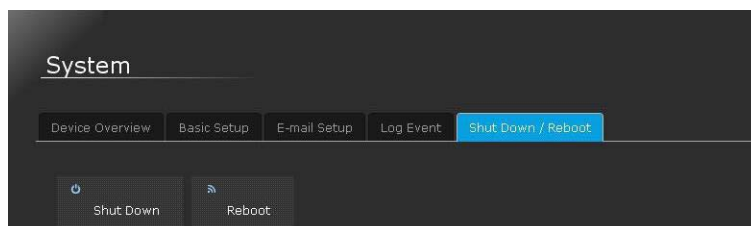


The screenshot shows the 'System' menu with the 'Log Event' tab selected. Below the menu is a table titled 'Log Event Information' with columns: Type, Level, Date Time, Message, and ACK. The table lists various system events including warnings about degraded volume and information about system startup, network link status, and hardware detection. At the bottom, there are icons for deleting old logs, deleting all logs, and refreshing the view, along with a page indicator 'Page 1 of 13' and a view count 'View 1 - 10 of 130'.

Type	Level	Date Time	Message	ACK
Volume	Warning	2011-07-06 18:04:30	Volume 0 is in degraded mode.	!
SYSTEM	Information	2011-07-06 17:49:34	System startup.	--
SYSTEM	Warning	2011-07-06 17:49:33	System had abnormal shutdown last time.	!
Network	Information	2011-07-06 17:49:32	LAN 1 link is up 100 Mbps.	--
USB	Information	2011-07-06 17:49:32	USB device inserted on port 1.	--
HDD	Information	2011-07-06 17:49:16	HDD 2 is detected.	--
HDD	Information	2011-07-06 17:49:16	HDD 1 is detected.	--
Volume	Warning	2011-07-06 15:01:57	Volume 0 is in degraded mode.	!
SYSTEM	Information	2011-07-06 14:46:57	System startup.	--
SYSTEM	Warning	2011-07-06 14:46:56	System had abnormal shutdown last time.	!

Shut Down/Reboot

Use the Shut Down/Reboot tab to remotely shut down or reboot the SilverStore.



The screenshot shows the 'System' menu with the 'Shut Down / Reboot' tab selected. Below the menu are two buttons: 'Shut Down' with a power icon and 'Reboot' with a circular arrow icon.

To remotely shutdown or reboot the system:

- Click Shutdown to turn off SilverStore.
- Click Reboot to restart SilverStore.

Using the Advanced Menu

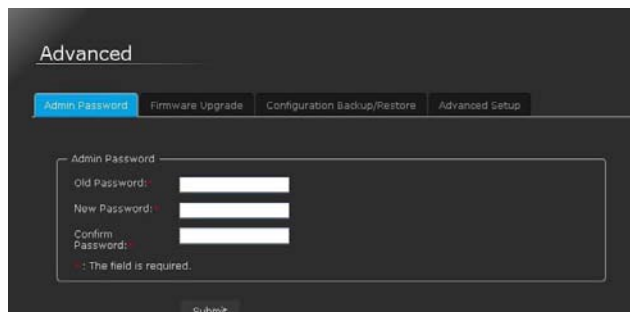
The Advanced menu allows administrators to change the login password, upgrade the SilverStore firmware, backup the SilverStore system configuration information, restore system to factory defaults, enable the file system checking features and check the hard drives for bad blocks.

The Advanced menu provides access to the following configuration options:

- Admin Password
- Firmware Upgrade
- System Configuration Backup/Restore
- Advanced Setup

Admin Password

Use the Admin Password tab to change the login password.



The screenshot shows the 'Advanced' menu with four tabs: 'Admin Password' (selected), 'Firmware Upgrade', 'Configuration Backup/Restore', and 'Advanced Setup'. The 'Admin Password' tab contains a form with the following fields:

- Admin Password** (header)
- Old Password:** (text input field)
- New Password:** (text input field)
- Confirm Password:** (text input field)
- Submit** (button)

Below the 'Confirm Password' field, there is a red error message: "The field is required."

To change the administrator login password:

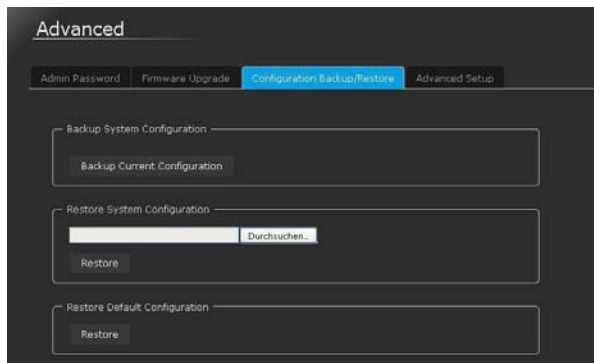
1. Click the Admin Password tab.
2. In the Old Password box, enter the old password.
3. In the New Password box, enter the new password. The maximum length of the password must not be more than 15 alphanumeric characters. Password is case sensitive and should be entered exactly in the same way each time.
4. In the New Password confirmed box, re-enter the new password.
5. Click Submit.

Firmware Upgrade

Use the Firmware Upgrade tab to check the firmware version or upgrade the SilverStore firmware.

New firmware usually fixes bugs and adds additional features to your SilverStore. Check on www.freecom.com if new firmware updates are available for the Freecom SilverStore.

Freecom will release new and updated firmware on a regular basis.



To upgrade the SilverStore firmware:

1. Download a copy of the new firmware from our Website to your computer. The firmware image filename should have the following format:
<firmware version>.img; for example fc2000.0091.img.
When you download the firmware file make sure that the filename is correct.

IMPORTANT: Do not rename the firmware file. The SilverStore storage appliance requires installation file with this filename — <firmware version>.img.

2. Click the Firmware Upgrade tab.
3. Click Choose File.
4. Select the appropriate uncompressed firmware file (the img file; e.g. fc2000.0091.img) on your computer.
5. Click Submit. A progress bar appears indicating the firmware is being upgraded.

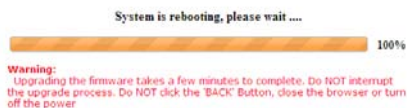


The update process may take a few minutes to complete.



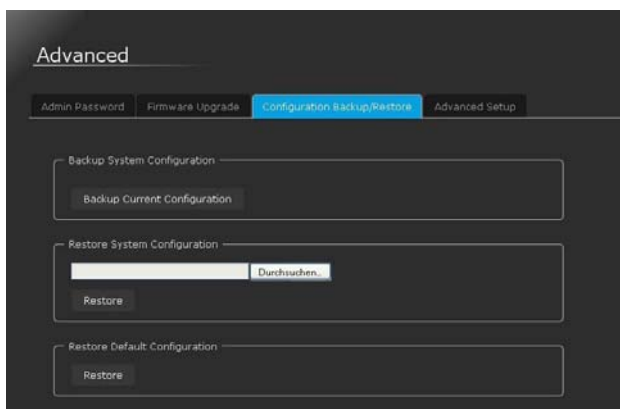
WARNING: Do not interrupt a firmware upgrade in progress, doing so may cause system to malfunction or unable to boot.

After the firmware is finished updating the SilverStore reboots automatically to initialize the new firmware. The web GUI redirects to the System Information page after the update is completed.



System Configuration Backup/Restore

Use the System Configuration Backup/Restore tab to create a backup copy of the current system configuration or restore system to factory default settings.



To backup your current configuration settings:

1. Click the System Configuration Backup/Restore tab.
2. In the Backup System Configuration section, click Backup Current Configuration.

To restore a saved configuration:

1. Click the System Configuration Backup/Restore tab.
2. In the Backup System Configuration section, click Choose File.
3. Select a saved configuration file.
4. Click Restore.

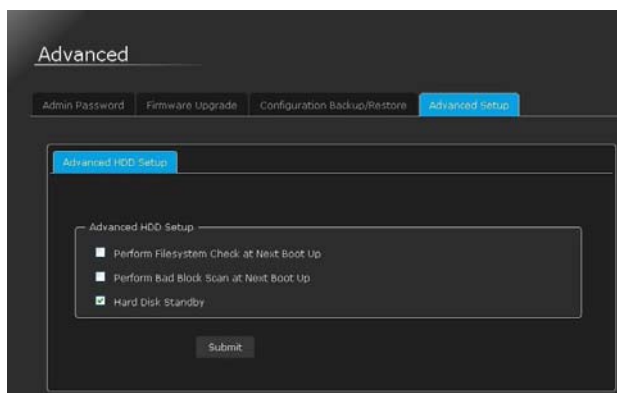
To restore SilverStore to factory settings:

IMPORTANT: Create a backup file of your current system configuration before restoring the system to its factory default settings. If you have made several changes to the system configuration file (i.e. adding multiple users) you can easily restore to the old system configuration file. When you restore to factory settings, all system settings such as the IP address, device name, admin user name and password, RAID configuration information, media files will be erased.

1. Click the System Configuration Backup/Restore tab.
2. In the Restore Default Configuration section, click Restore.

Advanced Setup

Use the Advanced Setup tab to enable the file system checking features, turn on scanning device for bad blocks and enable hard disk standby mode.



To enable file system check on reboot:

1. Click the Advanced Setup tab.
2. Click the Advanced HDD Setup subtab.
3. Click the Perform Filesystem Check at Next Boot Up check box.
4. Click Submit.

To enable bad block scan on reboot:

1. Click the Advanced Setup tab.
2. Click the Advanced HDD Setup subtab.
3. Click the Perform Bad Block Scan at Next Boot Up check box.
4. Click Submit.

To enable hard disk standby mode:

1. Click the Advanced Setup tab.
2. Click the Advanced HDD Setup subtab.
3. Click the Hard Disk Standby check box.
4. Click Submit.

Using the Network Menu

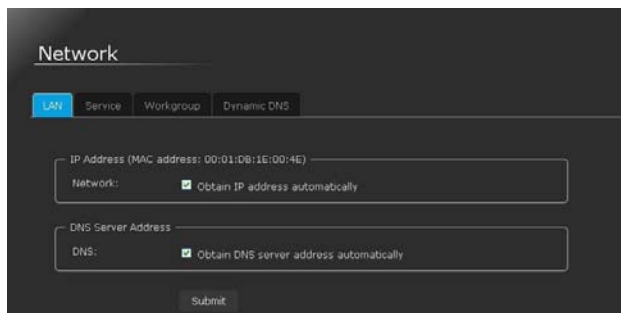
The Network menu allows administrators access to all network configuration options, such as setting up a DHCP/static IP address, network services (i.e., protocol, FTP, NFS, Apple network), and configuring membership in a domain or workgroup.

The Network menu provides access to the following configuration options:

- LAN
- Service
- Workgroup
- Dynamic DNS

LAN

Use the LAN tab to configure your network connection settings. You can either use DHCP or manually assign a new IP address. The SilverStore is set to automatically obtain IP addresses from a DHCP server. To assign a static IP address to the SilverStore, disable DHCP. A jumbo frame size support is also included for switch or routers that supports jumbo frame. SilverStore supports jumbo Ethernet frames to enhance Ethernet networking performance. Jumbo frames are frames that are bigger than the standard MTU (Maximum Transmission Unit), which is 1500 bytes. When SilverStore gets a frame size larger than its MTU, the data is broken into smaller frames or dropped. By default, the jumbo frame option is disabled in SilverStore.



Network

LAN Service Workgroup Dynamic DNS

IP Address (MAC address: 00:01:D8:1E:00:4E)

Network: ☒ Obtain IP address automatically

DNS Server Address

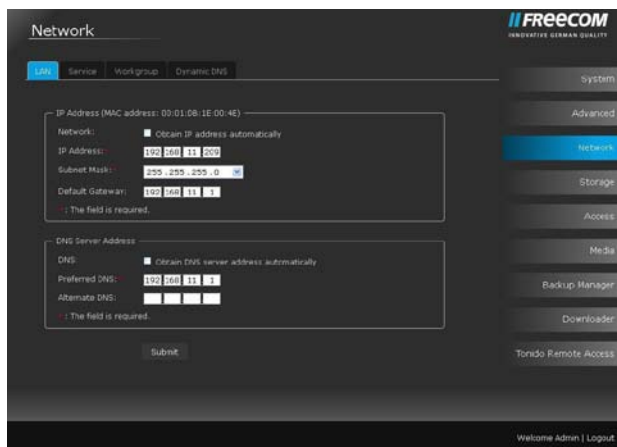
DNS: ☒ Obtain DNS server address automatically

Submit

To manually configure the IP settings:

NOTE: If you are connected to a home network, contact your Internet Service Provider (ISP) to obtain the static IP address.

1. Click the LAN tab.
2. Clear the Obtain IP address automatically check box next to Network.



Network

LAN Service Workgroup Dynamic DNS

IP Address (MAC address: 00:01:D8:1E:00:4E)

Network: ☐ Obtain IP address automatically

IP Address: 192.168.11.100

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.11.1

The field is required.

DNS Server Address

DNS: ☐ Obtain DNS server address automatically

Preferred DNS: 192.168.11.1

Alternate DNS:

The field is required.

Submit

FreeCOM
INNOVATIVE GERMAN QUALITY

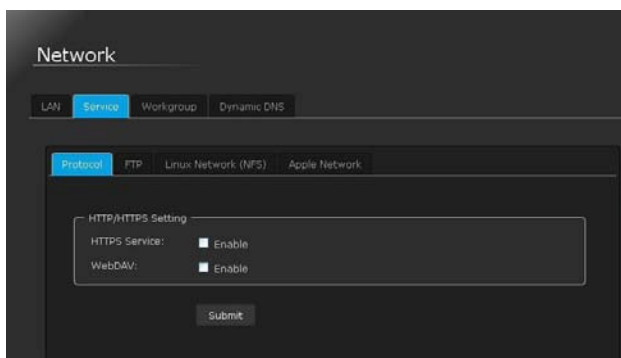
system
Advanced
Network
Storage
Access
Media
Backup Manager
Downloader
Toshiba Remote Access

Welcome Admin | Logout

3. In the IP address box, enter a valid IP address.
4. In the Subnet Mask drop-down menu, select a subnet mask.
5. In the Default Gateway box, enter the IP address of the gateway or router.
6. Clear the Obtain DNS server address automatically check box.
7. In the Preferred DNS box, enter the IP address of the DNS server.
8. In the Alternate DNS box, enter the second DNS address.
9. Click Submit.
10. You must restart SilverStore for the system to change to static IP address.

Service

Use the Service tab to configure the web and file services on the SilverStore. You can specify a network option, FTP, NFS or AFP to allow clients on different platforms (such as Mac, Windows, Linux, Unix) to access files and shared folders on the SilverStore, without requiring special software on the client's computer. File Transfer Protocol (FTP) service allows you to share files securely between the SilverStore and other computers over the Internet. The Network File System (NFS) service allows you to share files with Linux or UNIX clients or clients with the NFS client software. The Apple Filing Protocol (AFP) service allows you to share files with users on Mac systems.

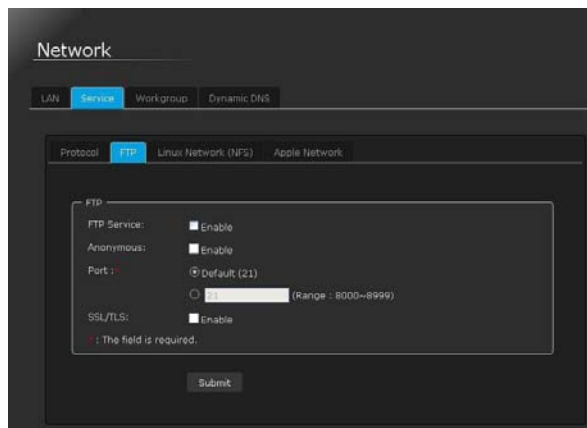


To configure the SilverStore for Web access:

1. Click the Protocol tab.
2. To enable HTTP access to the utility, click the HTTP Service Enable check box.
3. To enable WebDAV or HTTP access to the utility, click the WebDAV Enable check box.
4. Click Submit.

To enable FTP file service on the SilverStore:

1. Click the FTP tab.



2. Click the FTP Service Enable check box.
3. To enable anonymous access to the FTP server, click the Anonymous Enable check box. Public file sharing is easily accessed by enabling anonymous.

Anonymous FTP

Anonymous users log in with the user name “anonymous” and use an e-mail address as password. Anonymous users will have read-only access to the PUBLIC folder.

4. To change the default TCP port for the FTP connection, enter the port number in the Port box.
5. To enable SSL/TLS protocols, click the SSL/TLS Enable check box.
6. Click Submit.

To use FTP to access the SilverStore:

You can connect to the SilverStore via any FTP client. For example if your SilverStore's IP address is set to 10.34.45.59 entering ftp://10.34.45.59 in the Internet Explorer address bar will access the SilverStore's contents.

For accessing the SilverStore from the internet, your router have to be configured so that port 21 will be forwarded to the SilverStore IP adress.

DynDNS

Dynamic Domain Name System gives the ability to provide an official DNS name such as www.yourname.com to the dynamic IP address you have gotten from your ISP.

To do so, you first need to register with a DynDNS service. It updates the modified IP addresses and forwards this to the domain name. This enables you to be reached at one single domain name at any time even if your IP address changes.

We recommend using this feature, otherwise you always need to know the WAN IP of your router to access the SilverStore via FTP from the internet.

Use any FTP client software or open your browser and enter

ftp://USERNAME:USERPASSWORD@YOUR_INTERNET_IP

or

ftp://USERNAME:USERPASSWORD@YOUR_DYNDNS_HOST.

USERNAME = your username

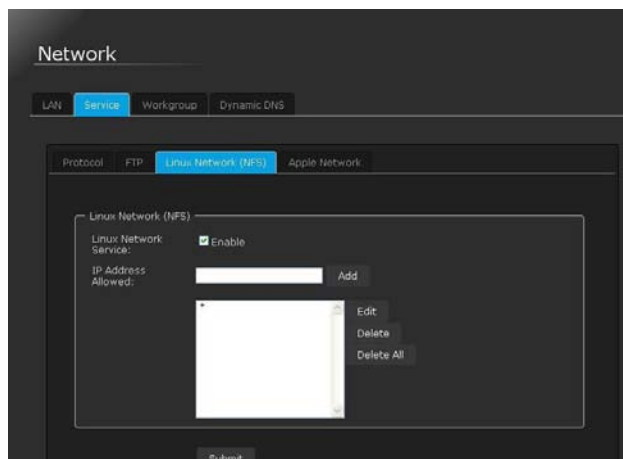
USERPASSWORD = your user password

YOUR_INTERNET_IP = your WAN IP address

YOUR_DYNDNS_HOST = your Dynamic DNS address

To enable the NFS file service on the SilverStore:

1. Click the Linux Network (NFS) tab.



2. Click the Linux Network Service Enable check box. The IP Allowed box appears.
3. Enter the IP filters that are allowed for NFS service, then click Add to add a new IP filter.
4. Click Submit.

To use NFS to access the SilverStore:

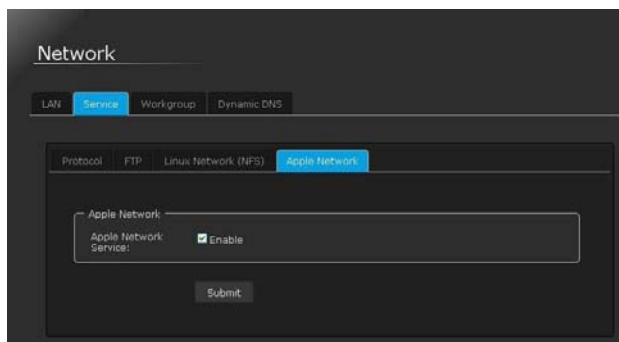
The mount point for NFS share is: /nfs/SHARENAME,

For example: /nfs/Public.

To access SilverStore through AFP:

The Apple Filing Protocol (AFP) is a network protocol that offers file services for Mac OS X.

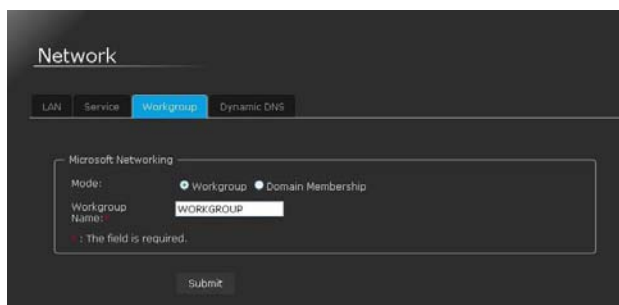
1. Click the Apple Network tab.



2. Click the Apple Network Service Enable check box.
3. Click Submit.

Workgroup

Use the Workgroup tab to set the SilverStore to join a workgroup or domain. Both workgroup and domain are ways of grouping computers on the network.



Workgroup Mode

By default, the SilverStore is joined to a Workgroup. Unlike workgroups, domains are controlled from a central location (domain controller) and require central authentication before you can join them. Workgroups, in contrast, are much simpler to control. As long as you know the workgroup name, you can add any computer to a workgroup.

To change the SilverStore's workgroup name:

1. Click the Workgroup tab.
2. Click the Workgroup radio button.
3. In the Workgroup Name box, enter the workgroup name.
4. Click Submit.

Domain Mode

If your network uses a domain (i.e., has Windows Automated Deployment Services), you may wish to connect the SilverStore as a domain member. When configured as a domain member, the SilverStore requests ADS (Automated Deployment Services) to authenticate users. Domain mode has a more restrictive security level, network users must enter appropriate passwords before gaining access to SilverStore.

When joining a domain, SilverStore needs the authorization of the domain's administrator. You must enter the Domain Name, Administrator and Administrator Password for the authorization.

NOTE: The local user and domain user share same access control if both their usernames are similar (not applicable in FTP service).

To join the SilverStore to a domain:

1. Click the Workgroup tab.
2. Click the Domain Membership radio button.

The screenshot shows the 'Network' configuration window of the SilverStore. The 'Workgroup' tab is selected, but the 'Domain Membership' radio button is chosen. The form contains the following fields and options:

- Mode:** Two radio buttons, 'Workgroup' (selected) and 'Domain Membership'.
- Domain NetBIOS Name:** Text box containing 'WORKGROUP'.
- AD Server Name:** Text box containing 'freecom'.
- Domain:** Text box containing 'freecom.com'.
- Domain Server IP Address:** Text box with a checked checkbox labeled 'Obtain domain server address automatically'.
- Administrator:** Text box containing 'support'.
- Password:** Text box with masked characters (asterisks).
- A red error message below the password field: 'The field is required.'
- A 'Submit' button at the bottom of the form.

The right sidebar shows a menu with 'Network' highlighted. The bottom status bar reads 'Welcome admin | Logout'.

3. In the Domain NetBIOS name box, enter the domain netbios name.
4. In the AD Server name box, enter the server name.
5. In the Domain box, enter a fully qualified AD domain name, for example, swlab-test.com.
6. To obtain a domain server IP address automatically, click the "Obtain domain server address automatically" check box. Or, clear this check box to manually enter the domain IP address.

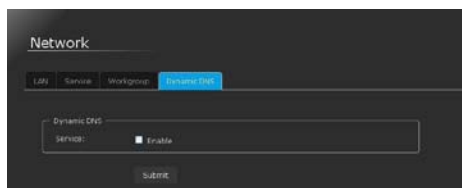
7. In the Administrator box, enter the administrator's user name.
8. In the Password box, enter the administrator's password.

NOTE: The administrator user name and password can contain up to 15 characters, including alphabetic, numeric, underscore, space, and most special characters. Both the administrator user name and password are case sensitive and should be entered exactly in the same way each time.

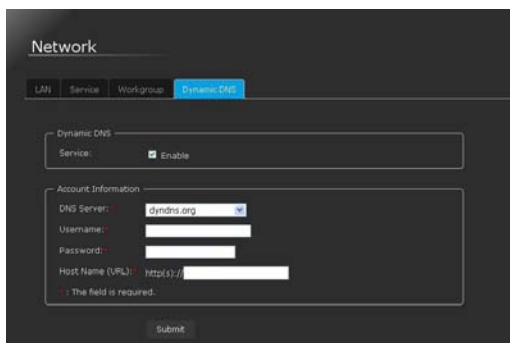
9. Click Submit.

Dynamic DNS

To set up Dynamic DNS:



1. Click the Dynamic DNS tab.
2. Next to Service activate the Enable check box.
Please check in your router configuration that the ports for the required services (e.g. port 21 for FTP) are forwarded to the IP address of your SilverStore.
3. Select your Dynamic DNS service provider from the drop-down menu.
4. Enter the domain name (URL), for example mydomain.dynalias.com; you registered with your DDNS (Dynamic DNS) service provider.
5. Enter the user name and password you used to set up your Dynamic DNS account.
6. Click Submit. You can now log in to the SilverStore via a Web browser using the domain name.



NOTE: When connecting to the SilverStore using a Web browser, make sure to include "https://" if you originally set the Web Access Protocol to HTTPS. Otherwise, only the name is required in the browser's address bar.

Using the Storage Menu

The Storage menu includes options for individual storage disk configuration and maintenance. It also includes services for volume management, iSCSI device management, external USB storage device management, shared folder management, and it allows you to perform remote RAID configuration options, view detailed USB storage device information and hard disk drive quota settings.

The Storage menu provides access to the following configuration options:

- Disk
- Volume
- iSCSI
- Shares
- USB Disk
- Quota
- Quota Usage

Disk

Use the Disk tab to view detailed information about the hard drives installed on the SilverStore.

Storage

Disk

Volume

iSCSI

Shares

USB Disk


Quota

Quota Usage

Hard Disk Information

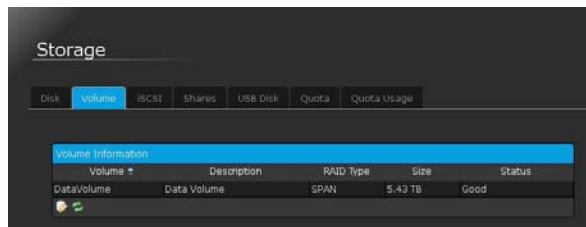
Harddisk	Model	Size	Status
HDD1	ST33000651A5	2.73 TB	Good
HDD2	ST33000651A5	2.73 TB	Good

You can view hard drive information such as the manufacturer or model name, size of the drive, and the status of the drive. Knowing the drive status allows you to monitor hard drive fault conditions and activity. The drive status that appears in the Status column includes the following status values:

- Good - Indicates the hard drive is accessible and functioning normally.
- Failed - Indicates a fatal error has occurred, such as the hard drive partition has been deleted, corrupted, or damaged caused by virus; or data loss.
- Foreign - Indicates SilverStore has detected an old hard drive or a hard drive containing personal data has been installed. A Clean disk icon  appears on disks that display the Foreign status. Unless the perform a clean disk operation, the files in the hard drive cannot be accessed. After performing Clean disk, the hard drive appears on the Disk Management table.

Volume

Use the Volume tab to manage storage volumes on the SilverStore. You can use modify, extend, and recover options to manage the storage volumes. This tab displays all the volumes currently defined on the SilverStore hard drive and provides access to configuration details relating to how disks are partitioned and how RAID volumes are created on these disk partitions. You can use these volumes to create shares at a later time.



The Volume tab includes a table that shows the current volumes available on the SilverStore. This table provides detailed summary of the current volume configuration, such as the name of the volume, description, RAID type (i.e. Stripe, Mirror, or Span), total drive capacity and volume status. A volume is a portion of one or more hard disks that are configured to store data.

The volume status that appears in the Status column includes the following values:

- **Good** - Indicates the volume is accessible and hard drive is functioning normally.
- **Failed** - Indicates a volume cannot be started automatically, the disk is damaged or the file system is corrupt.
- **Resyncing** - Occurs when creating a mirror or when a mirrored volume is being resynchronized so both mirrors contain identical data.
- **Formatting** - Indicates volume is being formatted or system is creating an ext3 (third extended) file system for a Linux operating system
- **Degraded** - A drive is missing while setting up a mirror configuration.
- **Recovering** - Occurs when the system detects a spare drive.

You can also use the Volume tab to configure the SATA hard drives into different software RAID types. RAID (Redundant Array of Independent Disk Drives) refers to an array of multiple independent hard drives that provide high performance and reliability. RAID function depends on the number of drives present and the RAID level you selected.

SilverStore supports the following RAID levels:

- **Stripe (RAID 0)** - All data are distributed evenly to all existing drives. The two drives work in unison to maximize system performance. However, RAID 0 has high risks of data security. If one drive fails then all data in both drives are lost.
- **Mirror (RAID 1)** - Two hard drives are required. Data written to one hard drive is simultaneously duplicated to another hard drive. If one drive fails, the other drive continues to function as single drive until the failed drive is replaced. To create a mirror you must select unallocated space on another hard drive and the unallocated space must be the same size or larger than the source drive you want to mirror. Data on a mirrored drive is secured, if one hard drive fails, SilverStore administers a warning and the failed drive must be replaced immediately.
- **Span** - Also known as JBOD (Just a Bunch of Drives). Two hard drives are required. Several hard drives are configured as a single hard disk expanding the capacity of the hard drive and results in a useable total capacity. However, span does not increase system performance or data security.

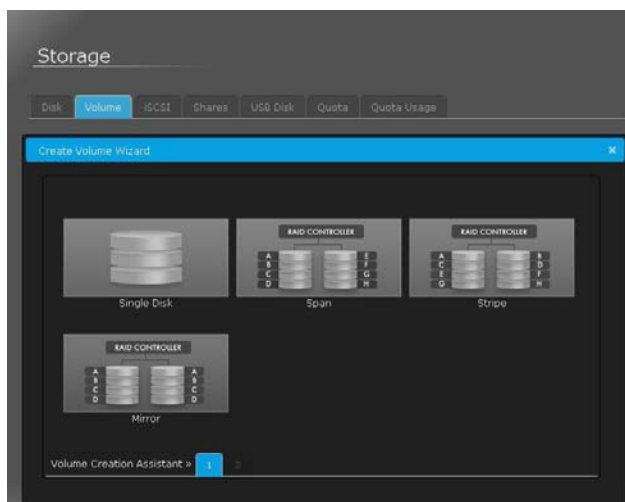
Default RAID configuration

The default RAID configuration for each hard drive installed on the SilverStore is as follows:

- If only one drive is installed in an empty drive bay, the default RAID configuration is span.
- If two hard drives are installed in the SilverStore, the default RAID configuration is mirror.

To create a volume:

1. Click the Volume tab.
2. Click the Create Volume icon.



3. In RAID configuration, select a hard drive configuration. The default logical volume name for SilverStore is DataVolume.

NOTE: Selecting RAID configuration erases all the disk contents including logical volumes and all shared folders and their subfolders and files. Be sure to backup all data before configuring SilverStore's hard drives for RAID.

4. Click Submit.

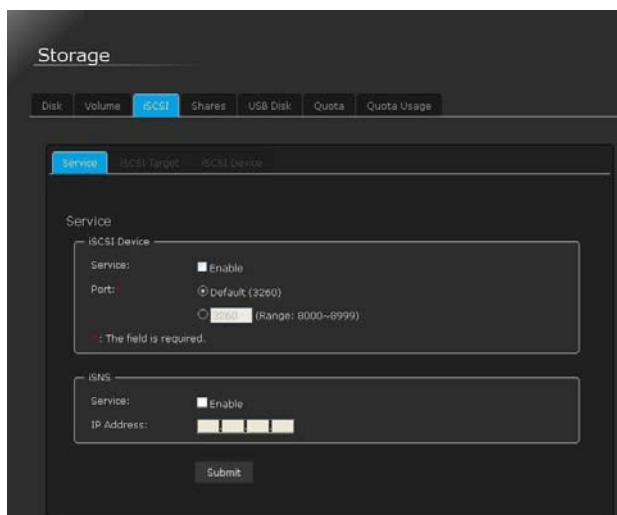
iSCSI

Use the iSCSI tab to enable the iSCSI (Internet Small Computer System Interface) or iSNS (Internet Storage Name Service) service, create an iSCSI device, set up an iSCSI target, and create an iSCSI initiator.

iSCSI is an IP-based standard for linking data storage devices over a network and transferring data by carrying SCSI commands over IP networks.

To configure the iSCSI service

1. Click the iSCSI tab.
2. Click the Service subtab.



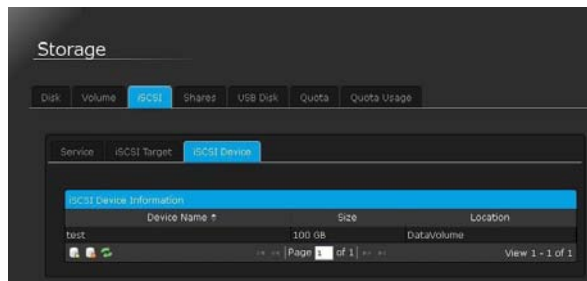
The screenshot shows the 'Storage' configuration page with the 'iSCSI' tab selected. Under the 'iSCSI' tab, the 'Service' subtab is active. The 'iSCSI Device' section has 'Service' checked (Enable), 'Port' set to 'Default (3260)', and a 'Port' field with a range of 8000-69999. A red error message states 'The field is required.' The 'iSNS' section has 'Service' checked (Enable) and an 'IP Address' field with four empty boxes. A 'Submit' button is at the bottom.

3. In the iSCSI Device section, click the Enable check box.
4. In the Port box, enter port number used for the iSCSI service.
5. In the iSNS section, click the Enable check box to enable automated discovery, management and configuration of iSCSI devices.
6. In the IP Address box, enter the IP address of the iSNS server.
7. Click Submit.

To create an iSCSI device:

NOTE: Before you start to create an iSCSI device, make sure you have enabled the iSCSI service. See previous section for detailed instructions.

1. Click the iSCSI tab.
2. Click the iSCSI Device subtab.



3. Click the Add icon located on the lower left corner of the Storage page.
4. In the Device Name box, enter a name for the device.

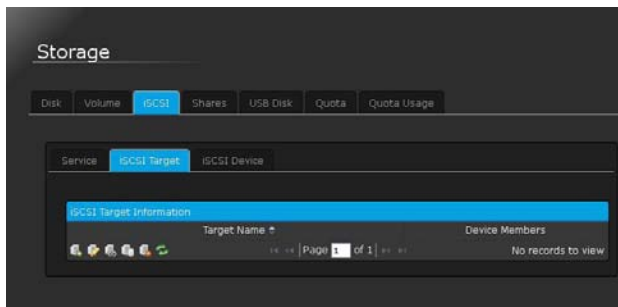


5. In the Size box, enter the amount of storage space to allocate for this device.
6. In the Location box, select the volume in which the device will reside.
7. Click Submit.

To create an iSCSI target:

NOTE: Before you start to create an iSCSI target, make sure you have enabled the iSCSI service. See “To configure the iSCSI service” for detailed instructions.

1. Click the iSCSI tab.
2. Click the iSCSI Target subtab.



3. Click the Add icon located on the lower left corner of the Storage page.
4. In the IQN (iSCSI Qualified Name) box, enter a name for the iSCSI target. This will be name that appears in the Microsoft iSCSI initiator.
5. Click the optional Enable Header and/or Data Digest option to verify the iSCSI initiator when it attempts to connect to the target .
6. Enable the One-way and Mutual CHAP feature to use CHAP (Challenge Handshake Authentication Protocol) to authenticate connection between the iSCSI initiator and the iSCSI target. When enabled, only the iSCSI target authenticates the initiator. Enable this feature only if you want the client to perform an additional check to ensure that it is accessing the correct target.
7. If One-way and Mutual CHAP is enabled, you must enter a CHAP user name and password.
8. Click Next.
9. Review your settings and then click Back to make any changes or click Submit to complete iSCSI setup.

NOTE: Not only Windows computers can use iSCSI, there are more OS systems. Also for instance: VMWARE appliances.

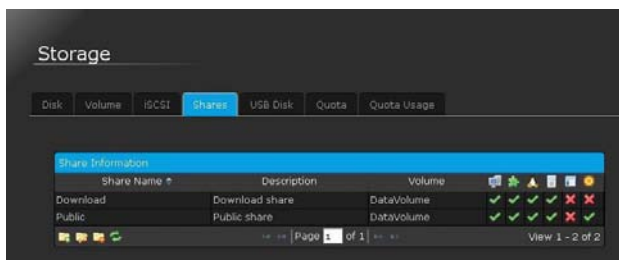
To configure the iSCSI Target

Once the Target is set up, you can make the following changes:

1. Change the iSCSI Target Settings. See "To create an iSCSI target".
2. Change the logical unit number (LUN) and permissions. By default, the LUN ID for a target is set to 0 and full access is granted. Follow these steps to make changes.
 - (a) Click the iSCSI Target subtab.
 - (b) Click the iSCSI device mapping icon next to the target that you want to modify and then click the Add icon.
 - (c) In the LUN ID box, specify the LUN ID number. You can have as many as 256 LUN IDs.
 - (d) Specify the access permission — Read Only or Full Access, for the iSCSI initiators that attempt to access the target.
 - (e) In the iSCSI Device list, select an additional device to map to.
 - (f) Click Submit.
3. Create an iSCSI initiator mask. You can set up initiator masking to restrict target access only to the initiator name entered. An iSCSI target must exist before entering an initiator name.
 - (a) Click the iSCSI Target subtab.
 - (b) Click the iSCSI initiator mapping icon next to the target that you want to modify and then click the Add icon.
 - (c) In the Initiator Name box, enter the full initiator IQN from the iSCSI Initiator tool (for example, iqn.1992-09.com.seagate:initiatorname).
 - (d) Click Submit.

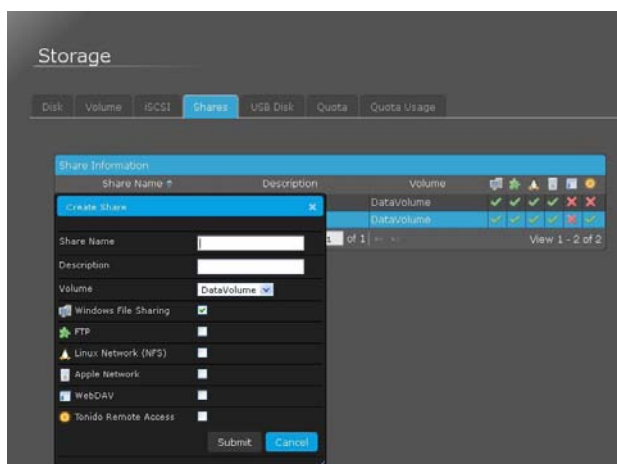
Shares

Use the Shares tab to manage shares in the SilverStore. This tab includes a table that displays a list of all the shares, logical volumes, and protocols currently defined on the SilverStore hard drive. SilverStore comes preconfigured with two shared folders: Public and Download. When a FAT32/NTFS/HFS+/EXT2/EXT3/EXT4 formatted USB hard drive is connected to the system, the USB device displays as USB share.



To create a new share on a logical volume:

1. Click the Shares tab.
2. Click the Create icon located on the lower left corner of the Storage page.



3. In the Share Name box, enter a name for the share. The share name can contain up to 32 characters, including alphabetic, numeric, or underscore.
4. In the Description box, enter a brief description.
5. In the Volume drop down menu, select a volume name.

6. Select a file sharing protocol. SilverStore supports the following file sharing protocols:
 - Windows File Sharing/Common Internet File System (CIFS) - A standard way that clients share files across intranets. CIFS allows Windows, Mac, or Linux clients to access folders and files stored on your SilverStore. The access control for CIFS is set as a share folder. Share folder defines access rights for each user/group, the user needs to enter his/her password for accessing the share. When the client browses the shares via Windows Explorer, he can only see the shares which he granted access right (Read Only or Full Access) to them.
 - FTP (File Transfer Protocol) - Allows access to files on the SilverStore within your network and on computers outside your network.
 - NFS (Network File System) - Allows Linux clients or clients who have TCP/IP installed to remotely access folders and files on the SilverStore. Using NFS protocol, the client can access all or a portion of the shared file directory on the network. The portion of the file directory can be accessed with the privileges (read only or full access) designated to each file.
 - Apple Network - Allows Mac users to access files on the SilverStore.
 - WebDAV - Allows access to folders or files on the SilverStore using a Web browser.
 - Tonido Remote Access - Allows access to files and folders from remote PCs and mobile devices by using Tonido Remote Access.
7. Click Submit.

To modify the share properties:

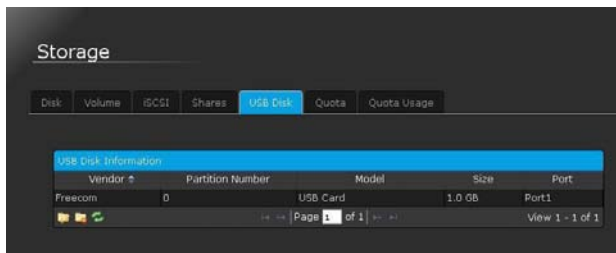
1. Click the Modify icon.
2. In the Share Name box, enter a new share name. The share name can contain up to 32 characters, including alphabetic, numeric, or underscore.
3. In the Description box, enter a brief description.
4. In the Volume drop down menu, select a volume name.
5. Select a file sharing protocol.
6. Click Submit.

To delete existing shares:

1. Select the share you want to delete.
2. Click the Delete icon.

USB Disk

The USB Disk tab provides configuration options for a USB hard drive connected to the SilverStore. Use this tab to remotely format a USB hard drive, safely disconnect a USB hard drive from the SilverStore, and backup data from a USB drive to the SilverStore.

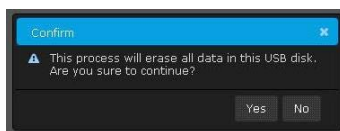


To format a USB hard drive:

1. Connect a USB hard drive to the SilverStore.

NOTE: SilverStore supports USB flash disk and external USB hard drives; USB optical drives (CD/DVD combo or DVD dual/multi) are not supported.

2. Select the USB hard drive you want to format, then click the Format icon. A dialog box appears warning that all data are erased.




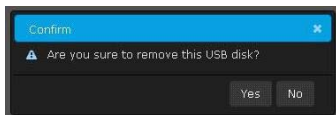
WARNING: Formatting hard drives erases all the disk contents, including partition tables, logical volumes, and all shared folders and subfolders and files. Perform this procedure only when you know that it is safe to proceed. When formatting a USB drive, only one partition is created and your partition is formatted as FAT32/NTFS/HFS+/EXT2/EXT3/EXT4 (Format can be selected in pull-down menu).

3. Click OK.
4. Disconnect the USB hard drive from the SilverStore.

To safely disconnect a USB hard drive from the SilverStore:

IMPORTANT: Unplugging a USB hard drive from the SilverStore without any precautions or safely disconnecting it may cause damage or problems to occur on SilverStore or data loss or damage to the USB hard drive.

1. On the USB Disk tab, select the device you wish to remove.
2. Click the Safely Remove Disk icon .



3. Click OK.

NOTE: When the USB hard drive is unplugged from the system, the USB shares that you have previously set on the USB device are also removed from the system.

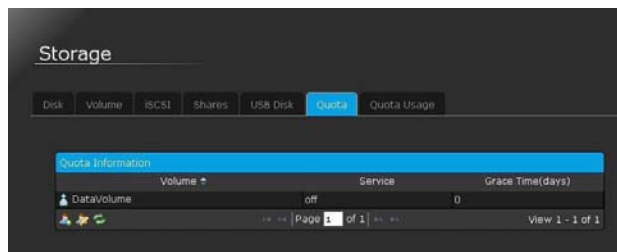
Quota

Use the Quota tab to control disk space usage on the SilverStore.

To set grace period for a disk quota

You can limit the amount of disk space used for a volume by setting a disk quota. If the disk quota is reached, you can temporarily allow an additional 100 megabytes (MB) of storage space by setting a grace period. When the grace period limit has been reached, no files can be added to the volume until disk space is made available.

1. Click the Quota tab.
2. Select a Volume name, then click the Modify icon located on the lower left corner of the Storage page.



3. Select Enable next to Quota Service.
4. Next to Grace Time, enter the number of days that the storage space can be exceeded.



CAUTION: The setting will apply to all saved or backed up files on that volume. Ensure that you will not accidentally lose important files on any of the volume's shares before you continue.

5. Click Submit.

To clear the grace period limit for a volume:

1. Click the Quota tab.
2. Select a Volume name, then click the Edit Quota icon.
3. Next to Quota Service, clear the Enable option.
4. Click Submit.

To enable disk quota service:

By default, the SilverStore imposes no limits on a user's storage space (except for the maximum size of the volume itself). However, you can set quota limits to any user account. Before you begin, ensure that the Quota Service is enabled for the volume that contains the shares the user will be accessing.

To enable the Quota Service:

1. Click the Quota tab.
2. Select a Volume name, then click the Edit Quota icon.
3. Next to Quota Service, select Enable.
4. Click Submit.

To allocate disk space to a user (and optionally impose a time limit on stored files):

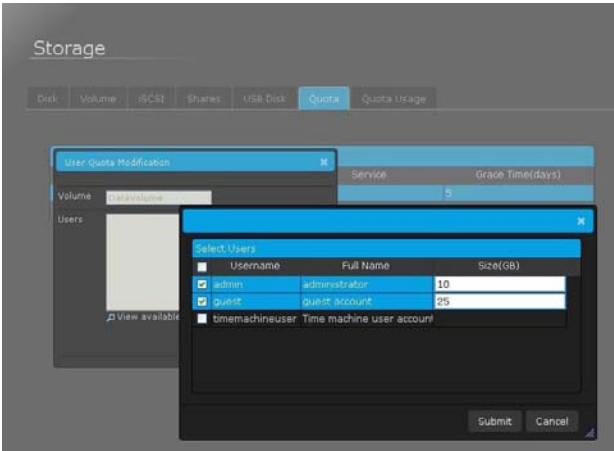
1. Click the Quota tab.
2. Select a Volume name.
3. Click the Modify icon, then click on "View available users".
4. In the User Quota box, enter the disk space limit (in GB) for the user.
5. Click Submit.

To remove storage space limitations for a user:

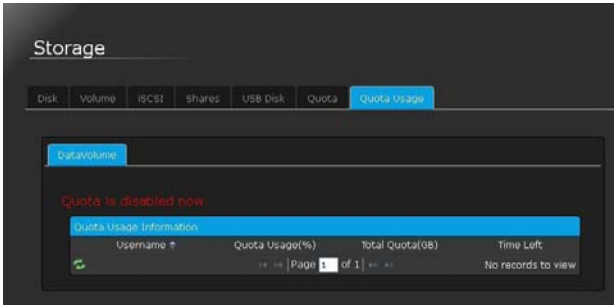
1. Click the Quota tab.
2. Select a Volume name (for example Data Volume User Quota). A list of all user accounts appears.
3. Click the Modify icon, then click on "View available users".
4. In the User Quota box, enter 0.
5. Click Submit.

Quota Usage

Use the Quota Usage tab to see how much quota every user has and how much of it is used.



You can configure the user size for the Quota Usage.



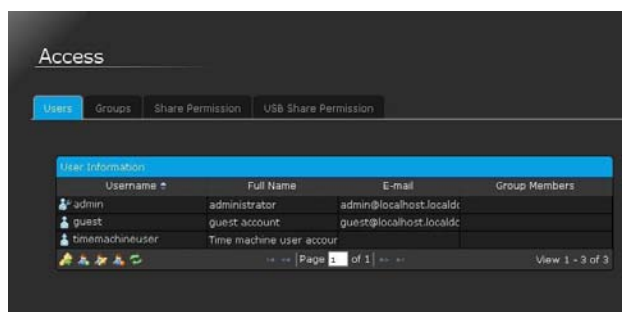
Using the Access Menu

The Access menu allows you to configure access control to files and folders in the SilverStore. The Access menu provides access to the following configuration options:

- Users
- Groups
- Share Permission
- USB Share Permission

Users

Use the Users tab to create, edit, and delete user accounts on the system. SilverStore comes preset with an administrator user name and password. The administrator account cannot be deleted.

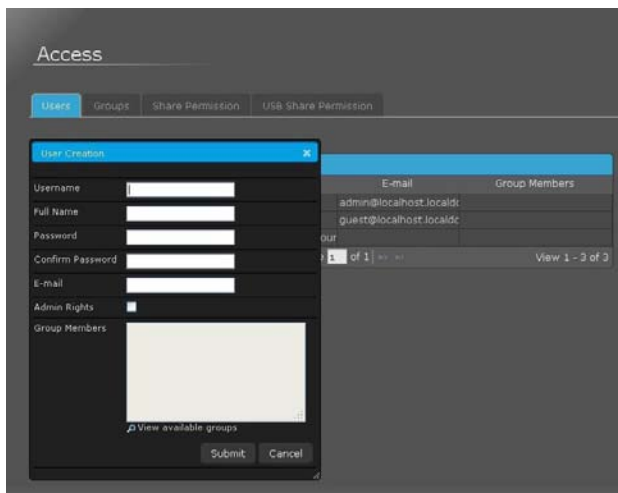


To create a user account:

Administrators can create user accounts and further customize these accounts with access permissions.

1. Click the Users tab.
2. Click the Add User icon located on the lower left corner of the Access page.

NOTE: The user name and password can contain up to 15 characters, including alphabetic, numeric, underscore, space, and most special characters. Both user name and password are case sensitive and should be entered exactly in the same way each time.



3. In the Username box, enter the user name.
4. In the Full Name box, enter the user's full name.
5. To secure the shared folder so that users must use a password to access it, enter a password in the Password box.
6. In the Confirm Password box, re-enter the password for confirmation.
7. In the Group List select a previously created Group for the user to join in.
8. In the E-mail box, enter the user's email address.
9. Click the Admin Rights check box, if the user shall have administrator rights .
10. In the Group Member box, select a group you want the user added to. When a user is created the Web UI provides a shortcut to create a default share at the same time, the new user is granted Full Access to its default share, the default share name is similar to the user name.

NOTE: Make sure the status of system volume is good/degraded.

To modify a user account:

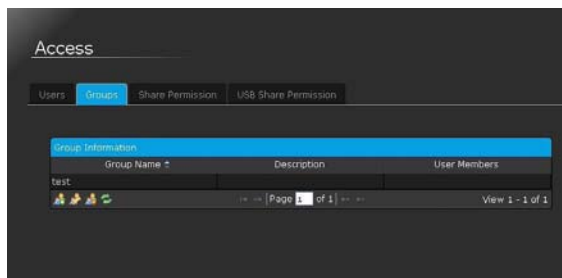
1. Select the user account you want to modify.
2. Click the Edit user icon.
3. Make the changes you want, then click Submit.

To delete a user account:

1. Select the user account you want to delete.
2. Click the Delete user icon.

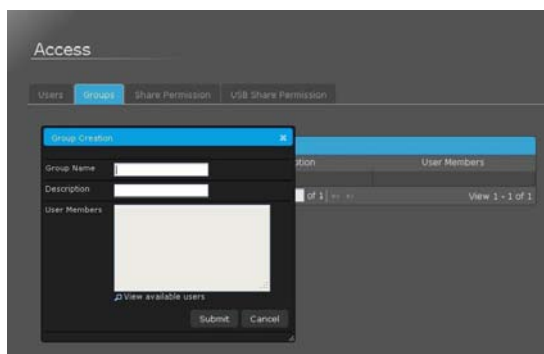
Groups

Use the Groups tab to create, edit, and delete a group on the SilverStore.



To create a new local group:

1. Click the Groups tab.
2. Click the Add Group icon located on the lower left corner of the Access page.



3. In the Group Name box, enter the group name. The group name can contain up to 32 characters, including alphabetic, numeric or underscore.
4. In the Description box, enter a description for the new group.
5. In the User Members, specify which users should be members of the group.
6. Click Submit.

To modify a local group:




1. Click the Groups tab.
2. Select the group you want to modify, then click the Add Group icon.
3. Make the changes you want, then click Submit.

To delete a local group:

1. Click the Groups tab.
2. Select the group you want to delete, then click the Delete Group icon.

Share Permission

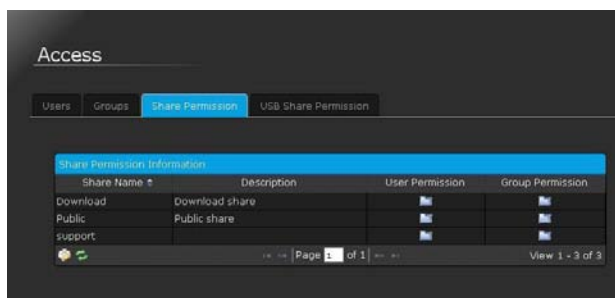
Use the Share Permission tab to specify the user or group's share access permission. Each user or group must have access permission to access shared resource on the SilverStore. There are three privilege levels an administrator can assign to a user or group.

- Full Access 
- Read Only 
- No Access 

When there is a conflict in the access rights of a user or group, SilverStore will use the following rule to handle the conflict:

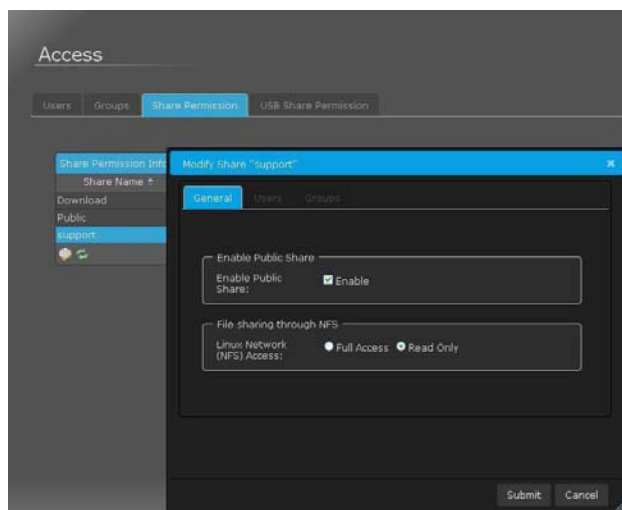
- No Access has the highest priority.
- Read Write + Read Only = Full Access.

If access permission is assigned to a user or group, the full access, read only, and no access icons appear on the Share Permission page.



To assign privilege levels for users or groups:

1. Click the Share Permission tab.
2. Select a share name, then click the Modify Permission icon located on the lower left corner of the Access page.






3. Click the General subtab.
4. In the Enable Public Share section, click the Enabled check box to enable a public access to the logical volume.

NOTE: This will deactivate the users and groups subtabs. Do not enable the checkbox if you want to define specific privilege levels for users and for groups.

5. In the File sharing through NFS section, specify access permission when using a NFS protocol.
6. Click the Users subtab.
7. Select a user, then specify a privilege level for the user.
8. Click the Groups subtab.
9. Select a group, then specify a privilege level for the group.
10. Click Submit.

USB Share Permission

Use the USB Share Permission tab to set the access permission for the USB ports of the SilverStore. There are three privilege levels an administrator can assign to a user or group:

- Full Access 
- Read Only 
- No Access 

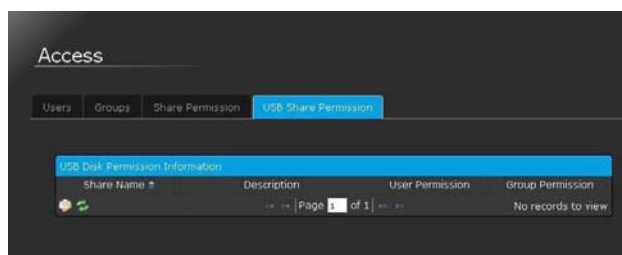
When there is a conflict in the access rights of a user or group, SilverStore will use the following rule to handle the conflict:

- No Access has the highest priority.
- Read Write + Read Only = Full Access.

If access permission is assigned to a user or group, the full access, read only, and no access icons appear on the USB Share Permission page. You can move your mouse over the icon to view the user or group list.

To configure the privilege levels for a USB share:

1. Click the USB Permission tab.



2. Select a USB share name, then click the Modify Permission icon located on the lower left corner of the Access page.
3. Make the changes you want, then click Submit.

Using the Media Menu

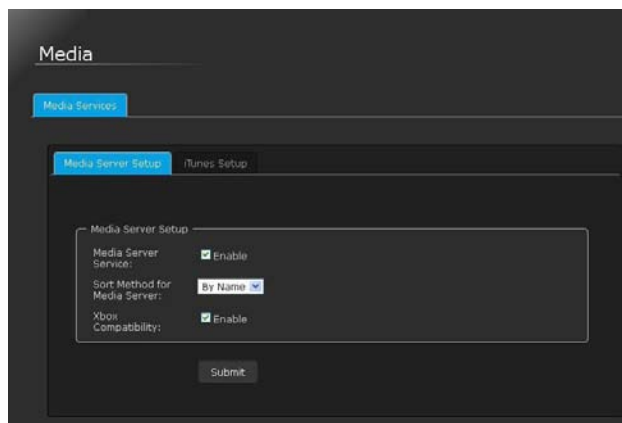
The Media menu allows administrators to set up the SilverStore as a media server, enable iTunes service on the SilverStore, and configure how files and folders will appear when accessed by control points and renderers based on UPnP structure. Why, you may wonder, can UPnP structure based devices access media files in the SilverStore? This is attributed to WiDMS, an embedded software resolution in SilverStore, providing you with content directory service that allows you to control the UPnP structure based renderers to play media files in SilverStore in a wireless manner. The application auto starts once the SilverStore is powered on. With its configuration mechanism, WiDMS makes it possible for you to manage its configuration without extra tools.

The Media menu provides access to the following configuration options:

- Media Server Setup
- iTunes Setup

Media Services

Use the Media Services tab to enable the digital media service, sorting method for media files on the SilverStore, enable compatibility with an Xbox 360 machine, and enable iTunes service.



To set up SilverStore as a media server:

You can use the SilverStore to share digital photos, videos and music on your local network.

1. Click the Media tab.
2. Click the Media Server Setup subtab.
3. Next to Media Server Service, click the Enable check box.

4. Specify a sorting method for media files on the SilverStore.

You can choose from the following media file sorting method:

- By name - Files and folders are arranged according to their original organization.
- By date - WiDMS auto checks the latest modification dates of files and accordingly creates folders named by year and subfolders by month.

NOTE: You should access the media library with control points and renderers based on UPnP structure such as TV sets or other network media players.

5. Next to Xbox Compatibility, click the Enable check box if you want to enable compatibility with an Xbox 360. You may need to disable this feature if other digital media players are unable to find content on the SilverStore.
6. Click Submit.

To set up iTunes Music Server on the SilverStore:

1. Click the Media Services tab.
2. Click the iTunes Setup subtab.
3. Next to iTunes Service, click the Enable check box.
4. Specify the time when the server should check for new music.
5. Click Submit.

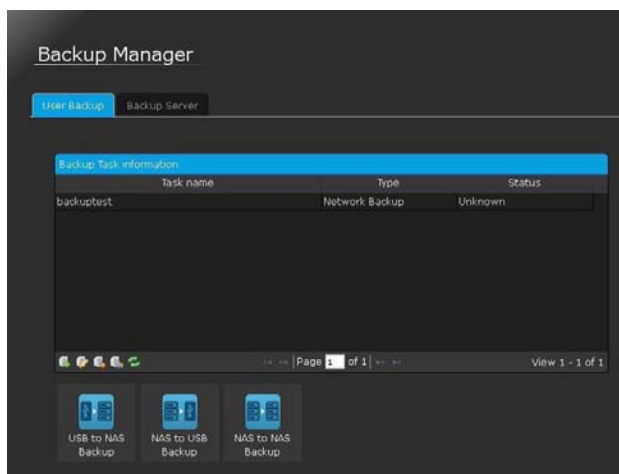
The media service is enabled. Media files have to be stored in the “Public” share.

Note: Please use the “Public” share to store media files for using the Media service.

Using the Backup Manager Menu

The Backup Manager menu allows administrators to schedule and monitor file backup tasks from the SilverStore to a USB storage device or vice versa. The Backup Manager menu provides access to the following configuration options:

- User Backup
- Backup Server



User Backup

Use the User Backup tab to perform the following file backup tasks:

- Backup data from one SilverStore to another NAS device
- Backup data from SilverStore to a USB storage device
- Backup data from a USB storage device to the SilverStore

To schedule recurring file backup tasks:

1. Click the User Backup tab.
2. Select the type of recurring backup task you want to schedule:
 - USB to NAS Backup - File(s) from a USB storage device will be backed up to a share on the SilverStore.
 - NAS to USB Backup - Folder from the SilverStore will be backed up to a USB storage device.
 - NAS to NAS Backup - All shares on the SilverStore will be backed up to another SilverStore or server on your network.

3. Select the backup source and destination folder, then click Add.
4. Click Next.
5. Enter a description of the backup file that will be easy to identify and remember, then click Next.
6. Specify the days of the week on which you want the recurring backup task to run, then click Next.
7. Set a time for the recurring backup task to occur.
8. Click Schedule.

To monitor file backup tasks:

You can quickly check the progress of backup tasks in progress.

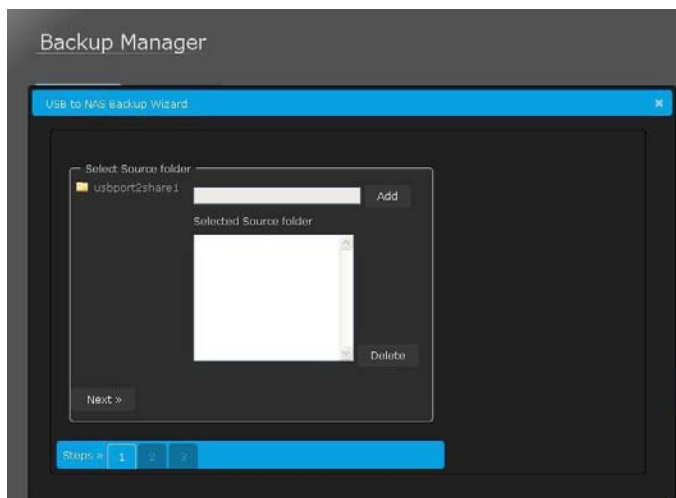
1. Click the User Backup tab. A list of running backup tasks appears.

To cancel file backup tasks:

1. Click the User Backup tab.
2. Select a backup task, then click Cancel.

To start file backup from a USB storage device to the SilverStore:

1. Click the User Backup tab.
2. Click the USB to NAS Backup button.

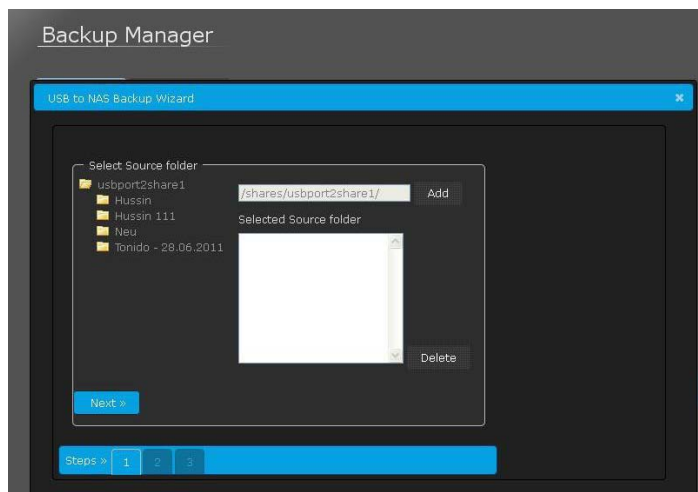


3. Click Add, then select the source folder for backup.
4. Click Start.

The backup task begins. You can check the progress of backup tasks in progress at any time (see Monitoring File Backup Tasks).

To start file backup from the SilverStore to a USB Storage Device:

1. Click the User Backup tab.
2. Click the NAS to USB Backup button.

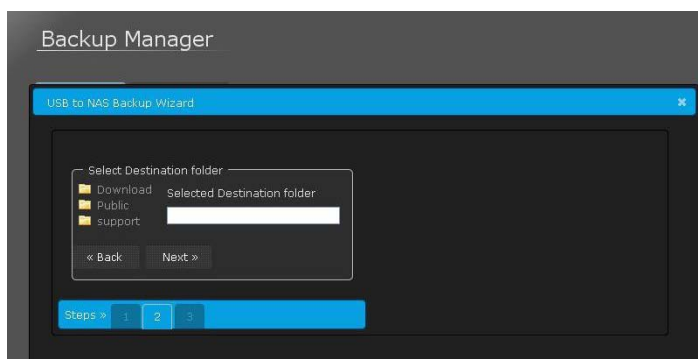


3. Click Add, then select the source folder for backup.
4. Click Start.

The backup task begins. You can check the progress of backup tasks in progress at any time.

To start a file backup from the SilverStore to another SilverStore or backup server on your network:

1. Click the User Backup tab.
2. Click the NAS to USB Backup button (You need only the IP-adress from the other device).



3. Select the folder you want to back up, then click Next.

4. Click Detect IP Address to find other backup servers on your network, then from the drop-down list, select the server where the backup share will be saved.

The other backup server's name appears automatically in the Alias name box.

5. Enter the required information, including authentication name and password for the destination backup server, then click Test Connection to ensure that the connection works.
6. Click Start.

The backup task begins. You can check the progress of backup tasks in progress at any time.

Note: For a NAS-to-NAS backup, the contents of a backup are hidden and cannot be seen via SMB. To see the contents of a backup, you have to select NAS-to-NAS Restore and open a backup.

To restore a backed up file:

By default, SilverStore retains all files that are stored or backed up on it indefinitely.

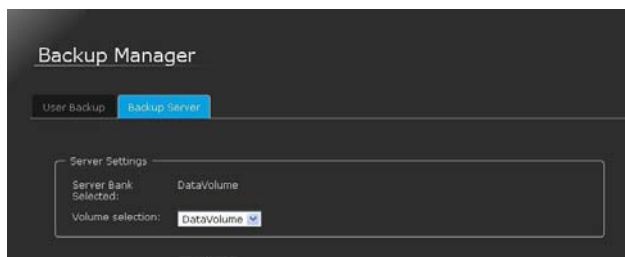
1. Click the User Backup tab.
2. Click Restore.

Previously backed up content displays in the Executed Schedule list. The details of the backup are shown below when you select an item.

3. Select a backed up item from the list.
4. Navigate to the Restore destination on the right side of the window.
5. Click Restore Now.

Backup Server

Use the Backup Server tab to select a volume as backup server. Click on Submit to apply the change.



Configuring a Time Machine Backup on the SilverStore (Mac OS X)

1. Open your browser and login to the web GUI.
2. Go to "Access" - "Users" and select the "timemachineuser".
3. Click on the lower left button to configure the password for the "timemachineuser". Select a password, retype it and click on OK.
4. Open the "Time Machine Preferences"
5. Switch on the Time Machine Backup. A window will open where to select the backup destination.
6. Select "Timemachine Backup" on "SilverStore-Backup". You will be prompted to enter user name and password.
7. Enter "timemachineuser" as user name and the password you defined before in the web GUI.
8. You will be logged in and the Time Machine Backup will be started.

Using the Downloader Menu

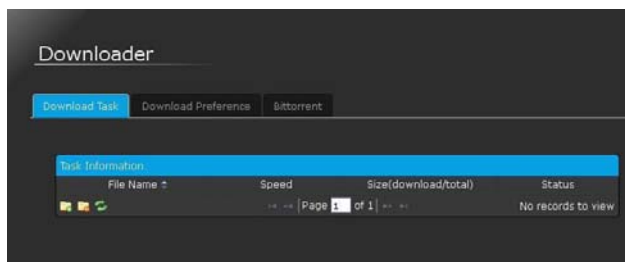
The Downloader menu allows administrators to view, manage, boost download speed, and organize file downloads.

The Downloader menu provides access to the following configuration options:

- Download Task
- Download Preference
- Bittorrent

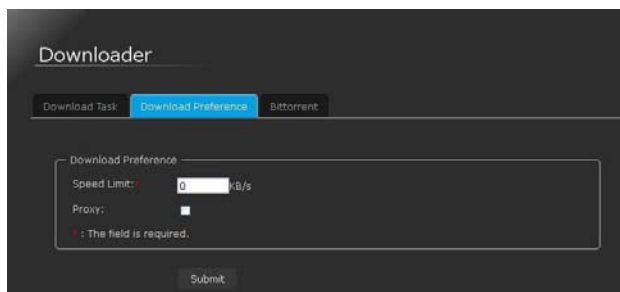
Download Task

Use the Download Task tab to manage file download task.



Download Preference

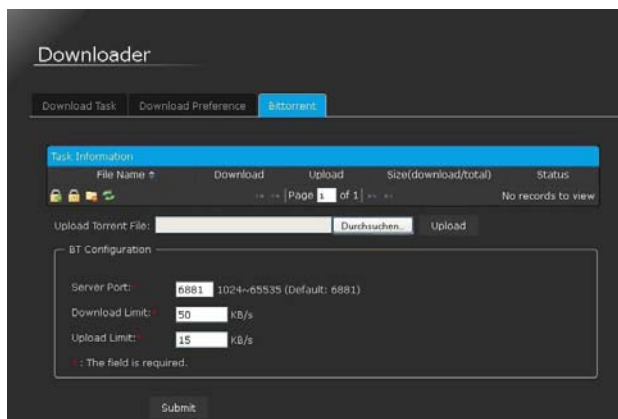
Use the Download Preference tab to customize the file download speed.



If you are using a Proxy, you can also add the IP address here.

Bittorrent

Use the Bittorrent tab to manage torrent files and customize the BT task priority.



Downloader

Download Task Download Preference **Bittorrent**

Task Information

File Name	Download	Upload	Size(download/total)	Status
Page 1 of 1				
No records to view				

Upload Torrent File:

BT Configuration

Server Port: 1024~65535 (Default: 6881)

Download Limit: KB/s

Upload Limit: KB/s

*: The field is required.

Tonido Remote Access

See "Chapter: Tonido Remote Access" for a detailed description how to setup and use Tonido Remote Access.

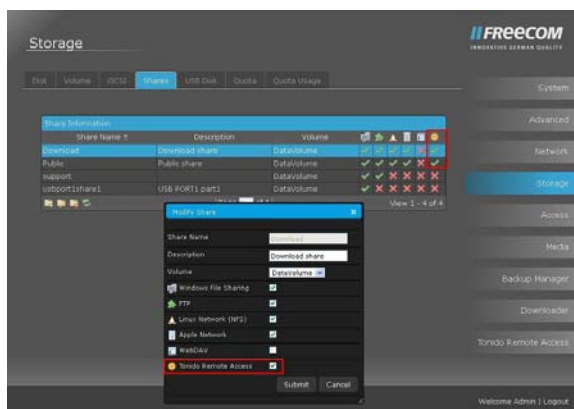
Chapter: Tonido Remote Access

Access to the SilverStore from the outside

Sharing folders for Tonido Remote Access

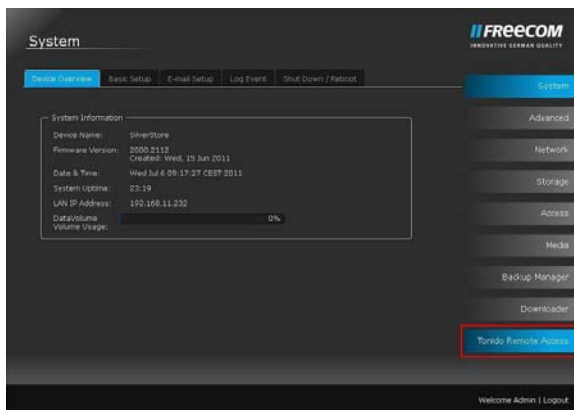
Before starting with Tonido Remote Access, folders have to be shared for Tonido Remote Access.

Login to the SilverStore web interface and go to Storage - Shares. Select a folder and click on "Modify Share" and choose "Tonido Remote Access".



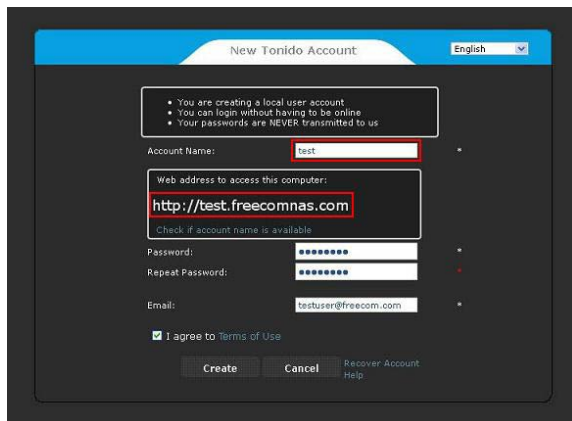
Tonido Remote Access Configuration

Login to the SilverStore web interface and click on the menu item "Tonido Remote Access".



Account Creation

Select an account name, enter password and mail address and accept the Terms of Use. Your device will be available from the outside under the web address <http://test.freecomnas.com> (where “test” stands for the name you selected).



New Tonido Account English

- You are creating a local user account
- You can login without having to be online
- Your passwords are NEVER transmitted to us

Account Name: test

Web address to access this computer:
<http://test.freecomnas.com>

Check if account name is available

Password: *****

Repeat Password: *****

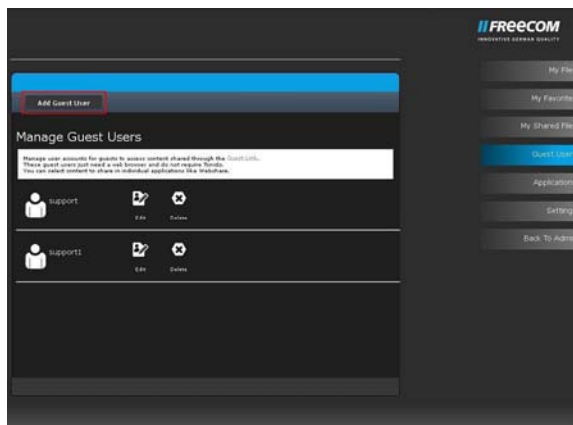
Email: testuser@freecom.com

☒ I agree to Terms of Use

Create Cancel Recover Account Help

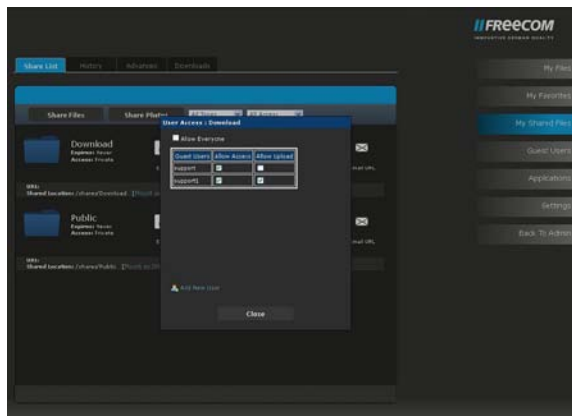
Adding users

In the Tonido GUI, go to “Guest Users”. Click on “Add Guest User” to add users that are allowed to access your device.



User Permissions

Define user access limitations for every shared folder ("Allow Access" and/or "Allow Upload").



Accessing from the outside

To access the SilverStore from the outside via Tonido Remote Access, use the following information:

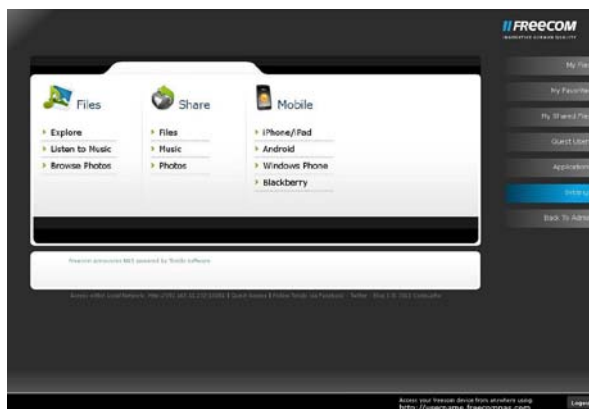
URL: <http://test.freecomnas.com> (where "test" stands for the name you selected)

Login with any user name and password you defined for guest users.

Share guest user accounts with your friends and family to give them access to your multimedia files. You can login from any PC and even with your iPhone, Android and Windows Mobile smartphones.

On logging in to Tonido, the main Tonido Home page is displayed as below. Two menus are presented prominently on the home page:

- **Right Hand menu:** Provides easy access to your files, favorites, guest user access, applications and settings
- **Main Menu:** Provides quick access to your main applications within Tonido that allow you to access your files, photos and other media and share them



On the bottom right of the Home page is the option to logout of your Tonido account. Also, there is the URL you can use to access Tonido from anywhere.

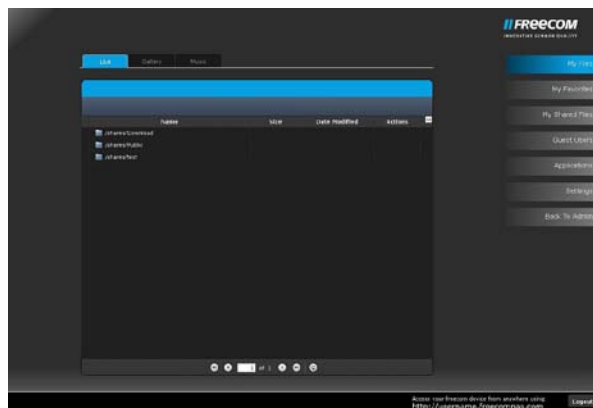
Now, let us explore each of these options on the home page.

Main Menu

Files:

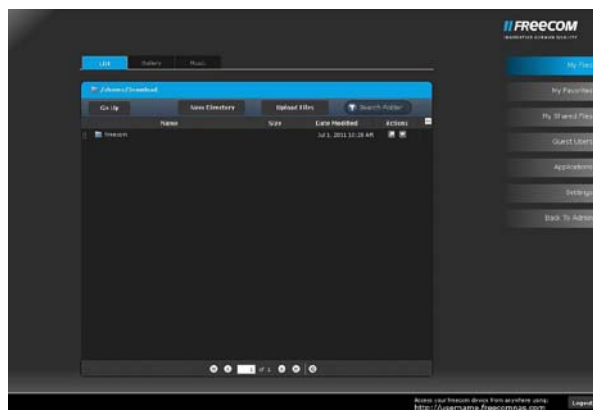
Explore:

Clicking on "Explore" provides access to your files on your SilverStore via a list view by default, with an additional gallery view and music tab view that allows for playing music files.



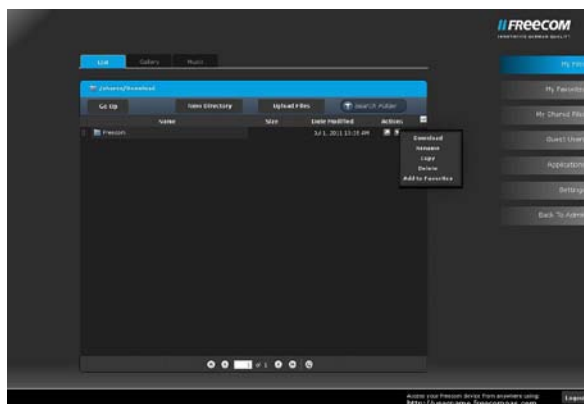
In the list view, the following user actions are possible:

- Uploading files
- Creating new directories/folders
- Searching for a file



Additionally, on each folder or file, the following actions are possible:

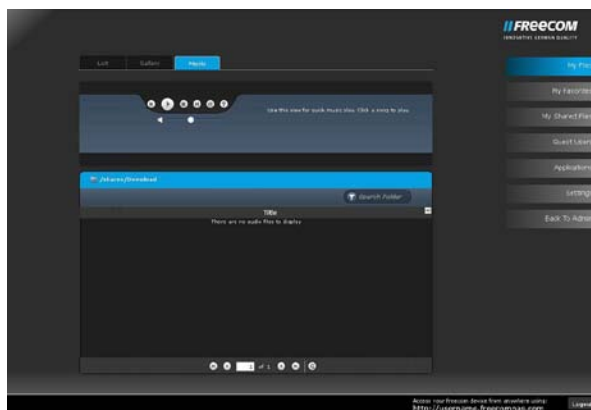
- Download
- Copy
- Rename
- Delete
- Add to Favorites
- Share



Media:

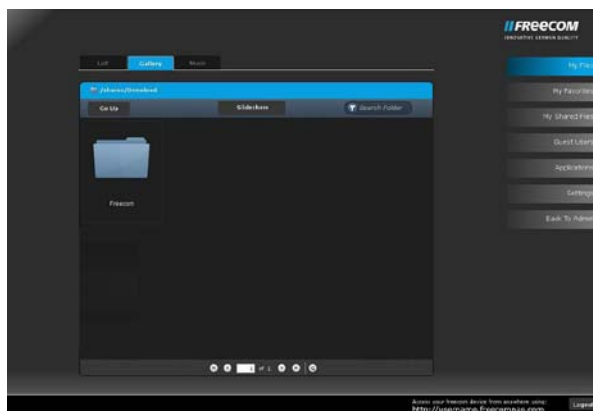
Listen to Music:

Selecting this option provides quick access to play music from your SilverStore via the Music tab view.



Browse Photos:

Selecting this option provides quick access to wath photos from your SilverStore via the gallery view.

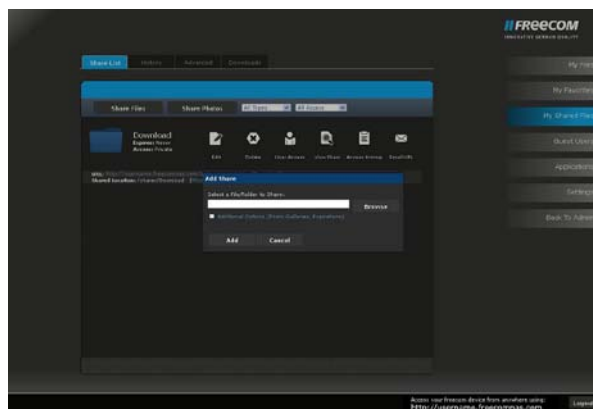


Share:

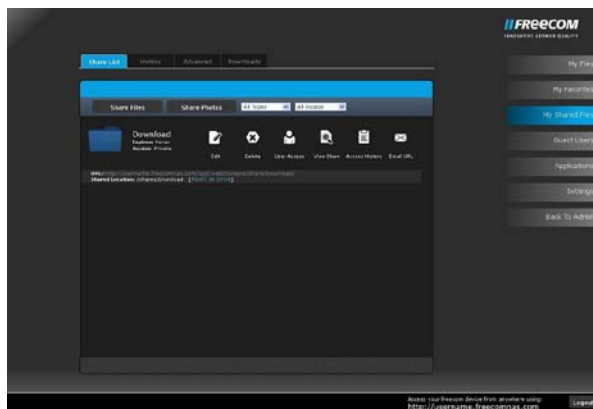
Files / Music / Photos:

Selecting the option to share files, music or photos, allows you to add a new folder to share, and specify access permissions for the folder.

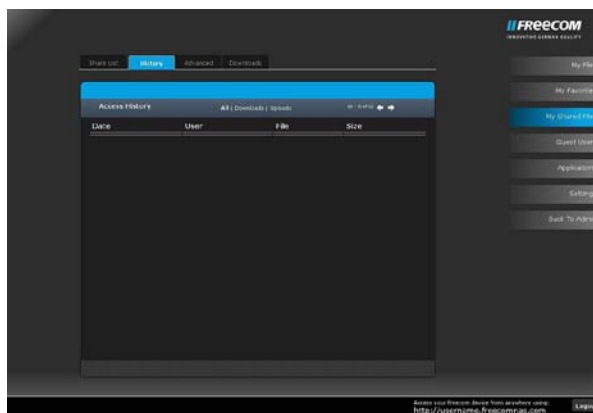
Select "Share Files" or "Share Photos" to start adding a share:



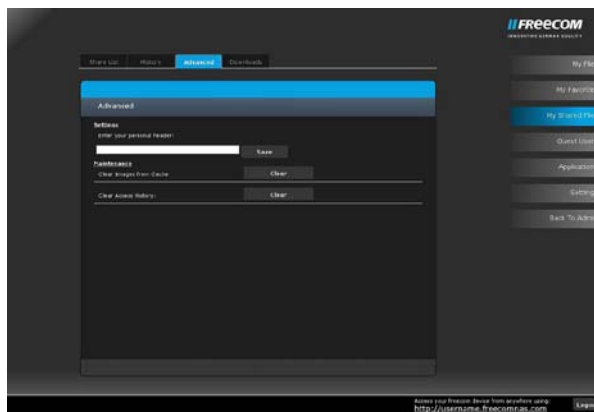
The screenshot below shows a folder that has been shared.



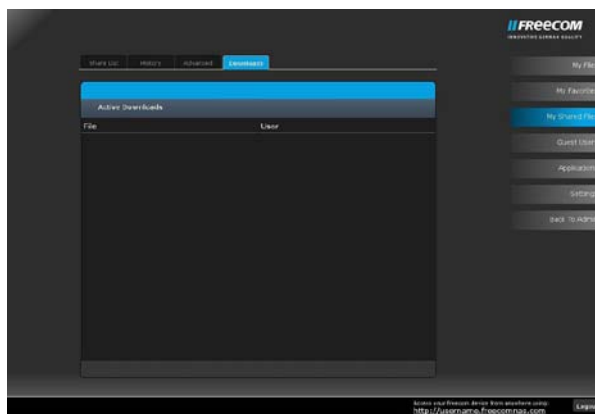
Access History: Provides information on when your shared files were last accessed/ viewed.



Settings (Advanced): Allows you to configure some settings for sharing. You can configure same settings for the shared files like the personal header and clear the access history image from cache.



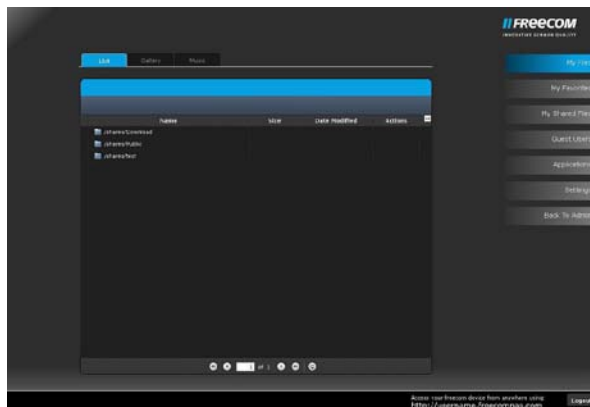
Active Downloads: Allows you to view the downloads that are active.



Right Hand Menu

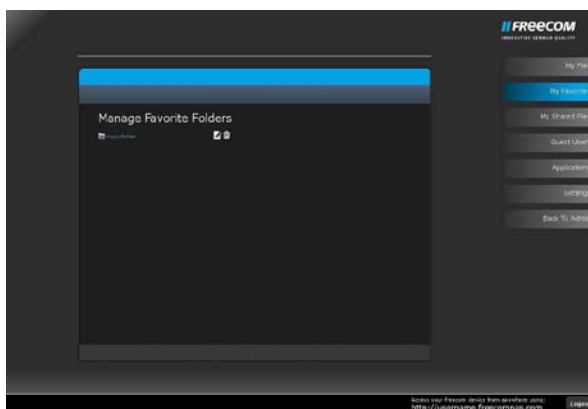
My Files:

Select this to allow easy access to your files within your computer. Your files are displayed in a list view by default, with an additional gallery view available. In addition to this, music files can be accessed in a music tab view that features an embedded player to play music files.



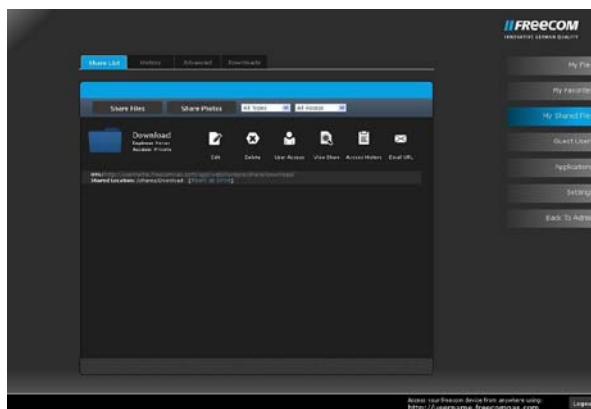
My Favorites:

Select this will display the list of files or folders marked as "Favorites". This allows easy and quick access to your favorite folders or files. You can favorite a folder or file under the Actions menu in the Explorer list view under My Files.



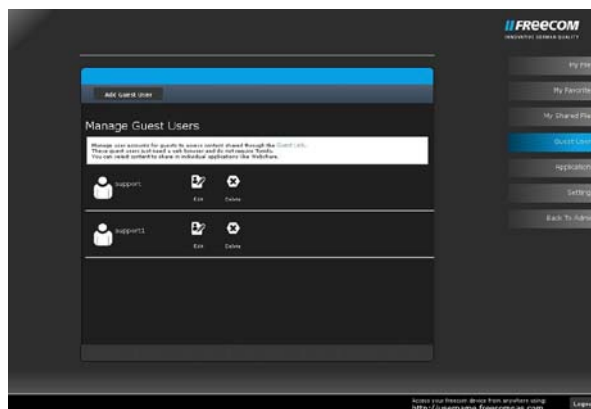
My Shared Files:

Selecting this provides quick access to the files or folders you have shared with other users.



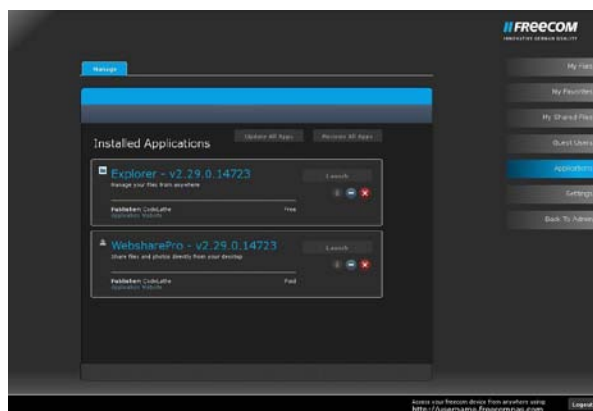
Guest Users:

Selecting this option provides quick access to manage the guest users you have set up for your account. That is, it allows you to add a guest user, edit or delete them.



Applications:

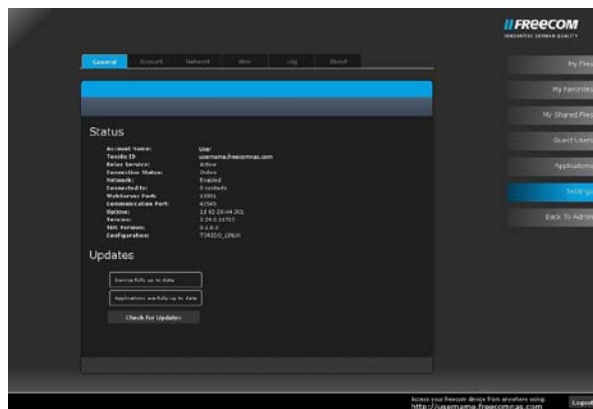
Selecting this provides a view of the applications installed with your account. This allows you to launch an application, suspend, uninstall an application or check for application updates.



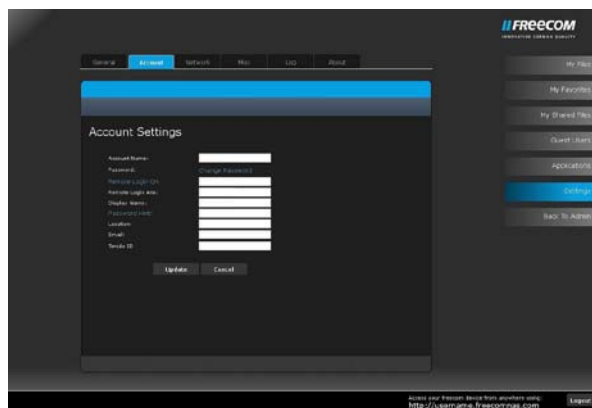
Settings:

Selecting this option provides you with access to various settings that you can configure for your account.

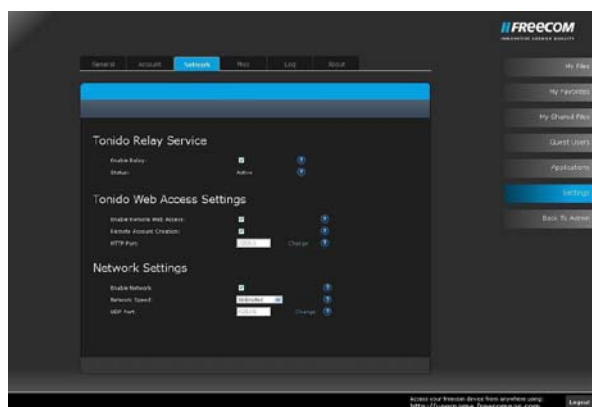
General



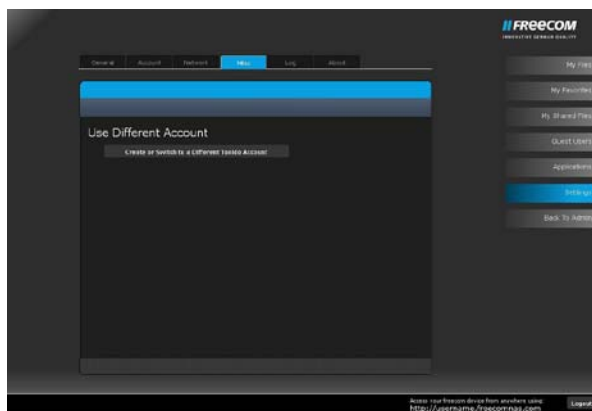
Account



Network



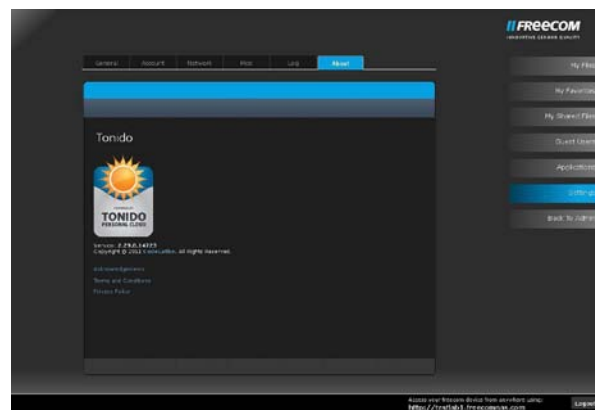
Miscellaneous



Log



About



Chapter: Troubleshooting

This chapter helps you identify and solve problems that might occur while you are using SilverStore.

For any issue, first ensure that you are using the latest firmware for SilverStore. The latest firmware encloses the latest network and SATA disk drivers.

If you are unable to resolve your server problems on your own, contact your dealer or Freecom Technologies for assistance.

Appendix A: CE, FCC and other certifications

CE

EN 55022 Declaration of Conformance. This is to certify that the Freecom SilverStore is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55022 Class B (CISPR 22).

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Federal Communications Commission (FCC) Compliance Notice

Radio Frequency Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Appendix B: Preparing LAN for use with the SilverStore

This appendix provides a description of how to prepare your computer network for connecting with the SilverStore and the Internet.

Preparing the computer for connection to the SilverStore

To connect to the SilverStore, you have to install TCP/IP (Transmission Control Protocol/Internet Protocol) on each of your network computers and select the required network protocol. If a network interface card (NIC) is already installed on your PC, then TCP/IP is probably also already installed.

Configuring Windows XP, Vista/7 to work with the SilverStore

To use your network and SilverStore, you may need to manually install TCP/IP and configure it on every computer in the network. Have your Windows CD at hand before you begin as you may need it when installing TCP/IP.

Installing or scanning Windows

Network components

You need to make sure that an Ethernet adapter (NIC), the TCP/IP protocol and the Client for Microsoft Networks are installed. You do not need to remove any of the other components displayed in the Network Components window. If you need to install the adapter, please refer to the instruction manual that came with the adapter on how to install the device. To install or scan for the other components:

1. Click the 'Start' button on the Windows taskbar, go to 'Settings' and then click 'Control Panel'.
2. Double-click the Network icon and Dial-up Connection (these may also be called Network Connections or Connect Using on the Mac).
3. If your computer has an Ethernet adapter, you should see an entry for a Local Area Connection. Double-click this entry and open the 'Properties' tab.
4. Open the 'General' tab.
5. Check to make sure that 'Client for Microsoft Networks' and 'Internet Protocol (TCP/IP)' are displayed on this screen. If they are not, go to 'Install' and add them.
6. Select 'Internet Protocol (TCP/IP)', click 'Properties' and check to make sure that 'Obtain an IP address automatically' is enabled.
7. Click 'OK' and close all windows for network and dial-up connections.
8. Make sure that the computer is connected to the SilverStore and check the TCP/IP properties (see below). If you notice any problems, you can restart the computer.

Check the TCP/IP properties

To check the computer's TCP/IP configuration:

1. Click 'Start' in the Windows taskbar and then press 'Run'. The 'Run' screen opens.
2. Enter 'cmd' and then click 'OK'. A command window appears on the screen.
3. Type in ipconfig /all. Your configuration details are displayed and should be as follows if you are using the default settings for TCP/IP recommended by Freecom:
4. The IP is between 192.168.1.2 and 192.168.1.254
5. The subnet mask is 255.255.255.0
6. The standard Gateway is 192.168.1.1
7. Type in exit.

MacOS X

With Macintosh OS 7 and higher, TCP/IP comes preinstalled on the Macintosh. To use DHCP, you need to configure TCP/IP on each Macintosh in the network.

1. Open 'System Preferences' and then 'Network'.
2. If it has not already been selected, click 'Built-in Ethernet' from the configuration list.
3. If this has not been selected, click 'Use DHCP' on the TCP/IP tab.
4. Hit 'Save'.

Check the TCP/IP properties (Macintosh)

Once your Macintosh has been configured and restarted, you can check the TCP/IP configuration by once again opening TCP/IP System Preferences. Open Apple's 'System Preferences' and hit 'TCP/IP'.

The overview is refreshed and shows your settings. These should look like this if you are using the default settings for TCP/IP recommended by Freecom:

1. The IP is between 192.168.1.2 and 192.168.1.254
2. The subnet mask is 255.255.255.0
3. The router address is 192.168.1.1

If different values are displayed, restart your Mac. It may be the case that you need to enable another option in the 'Configuration' settings and then return to 'Use a DHCP server'.

Appendix C: Network Basics

This chapter provides an overview of IP networks, routing, and firewalls. This is by no means a complete overview! If you are looking for more information, you can use your favorite search engine to find information on the internet about the internet. Suffice to say, there is plenty.

Basic Router Concepts

Even though the amount of bandwidth in your local area network (LAN) can be provided easily and relatively inexpensively, the price of the connection to the internet is much higher. Because of this expense, Internet access is usually provided by a slower-speed wide-area network (WAN) link such as a cable or DSL modem. To use this WAN link efficiently, a mechanism must be in place for selecting and transmitting only the data traffic meant for the Internet. The function of selecting and forwarding this data is performed by a router.

What is a Router?

A router splits the information meant for your network and meant for other networks, so the available bandwidth is used efficiently. The router sends data based on network layer information in the data and on routing tables maintained by the router. The routing tables are built by gathering and exchanging information with other routers in the network. The router builds up a logical picture of the overall network. Using this information, the router chooses the best path for forwarding network traffic. Routers vary in performance and scale, number of routing protocols supported, and types of physical WAN connection they support.

Routing Information Protocol

One of the protocols used by a router to build and maintain a picture of the network is the Routing Information Protocol (RIP). Using RIP, routers periodically update one another and check for changes to add to the routing table.

IP Addresses and the Internet

For a computer to communicate with other computers and Web servers on the Internet, it must have a unique IP address. An IP address (IP stands for Internet Protocol) is a unique number that identifies the location of your computer on a network.

Basically, it works like your street address — as a way to find out exactly where you are and deliver information to you. The IP address is written as 4 numbers between 0 and 255, such as "192.168.0.12".

This serves the same basic function as a street address. It helps you find out where you currently are, while also providing other information. The IP address consists of four numbers between 0 and 255 (e.g., 192.168.0.12).

Domain Name Server

The computer address is difficult to read, which is why a second system is used in the Internet by the name of DNS (Domain Name Server). This translates human-readable names such as www.sharemydisk.com into computer readable names like 82.161.11.206. Each Internet user must have an IP address. You do not need the human-readable name, but it is quite useful if you want other users to find you. A few examples of this include: if you operate a web server or if you want to show your friends images stored on your computer. Many large companies such as ISPs maintain their own DNS server and let their customers use the server to search for addresses.

Internet address classes

The Internet Assigned Numbers Authority (IANA) allocates certain blocks of addresses to organizations. Individual users or small organizations can obtain their addresses either from the IANA or from an Internet service provider (ISP). You can visit the IANA homepage at www.iana.org. The IANA issues different class of IP addresses. There are five standard classes of IP addresses. They are:

Class A

Class A addresses can have up to 16,777,214 hosts on a single network. They use an eight-bit network number and a 24-bit node number. Class A addresses are in this range: 1.x.x.x to 126.x.x.x.

Class B

Class B addresses can have up to 65,354 hosts on a network. A Class B address uses a 16-bit network number and a 16-bit node number. Class B addresses are in this range: 128.1.x.x to 191.254.x.x.

Class C

Class C addresses may have up to 254 hosts in one network. Class C addresses use 24 bits for network addresses and eight bits for nodes. They range from 192.0.1x to 223.255.254.x.

Class D

Class D addresses are used for multicasts, in other word messages sent to multiple hosts. Class D addresses range from 224.0.0.0 to 239.255.255.255.

Class E

Class E addresses are for experimental purposes. For each unique value in the network portion of the address, the range base address (the host address contains only zeroes) is known as the network address and is not usually assigned to a host. The top address of the range (host address contains only ones) is unassigned. It is instead used as the broadcast address for sending a data packet to all hosts with the same network address simultaneously.

Netmask

The partition scheme that separates the different address classes is used to identify a netmask attached to the IP address. A netmask is a 32-bit quantity that, in logical combination (using an AND operator) with an IP address, forms the network address. The netmasks for Class A, B and C are for instance 255.0.0.0, 255.255.0.0 and 255.255.255.0.

The address 192.168.170.237 is a Class C IP address; its network portion is 192.168.170. Combining it with the Class C netmask using an AND operator as shown in this example leaves only the network portion of the address:

11000000 10101000 10101010.11101101 (192.168.170.237)

combined with:

11111111.11111111.11111111.00000000 (255.255.255.0)

resulting in:

11000000 10101000 10101010.00000000 (192.168.170.0)

An alternative to dotted decimal representation is to express the netmask as the quantity of ones from left to right. This number is added to the IP address after a slash (/) as '/n'. In this example, the address 192.168.170.237/24 could be written. This indicates that the netmask is 24 ones followed by eight zeroes.

Subnet Addressing

You can see that even with a Class C address, there are a large number of hosts per network. It would be a very inefficient use of the amount of IP addresses to supply every LAN with so many IP addresses. A smaller office LANs does not have that many devices. A more efficient technique is known as subnet addressing.

Subnet addressing allows us to split one IP network address into smaller multiple physical networks known as subnetworks. Some of the node numbers are used as a subnet number instead. A Class B address gives us 16 bits of node numbers translating to 64,000 nodes. Most organizations do not use 64,000 nodes, so there are free bits that can be reassigned. Subnet addressing makes use of those bits that are free.

A Class B address can be effectively translated into multiple Class C addresses. For example, the IP address of 172.16.97.235 would be interpreted as IP network address 172.16, subnet number 97, and node number 235. In addition to extending the number of addresses available, subnet addressing provides other benefits. Subnet addressing allows a network manager to construct an address scheme for the network by using different subnets for other geographical locations in the network or for other departments in the organization.

Although the preceding example uses the entire third octet for a subnet address, note that you are not restricted to octet boundaries in subnetting. To create more network numbers, you only need to shift some bits from the host address to the network address. For instance, to partition a Class C network number (192.68.135.0) into two, you shift one bit from the host address to the network address. The new netmask (or subnet mask) is 255.255.255.128. The first subnet has network number 192.68.135.0 with hosts 192.68.135.1 to 129.68.135.126, and the second subnet has network number 192.68.135.128 with hosts 192.68.135.129 to 192.68.135.254.



Attention: The number 192.68.135.127 is not assigned because it is the broadcast address of the first subnet. The number 192.68.135.128 is not assigned because it is the network address of the second subnet.

Freecom strongly recommends that you configure all hosts on a LAN segment to use the same netmask for the following reasons:

- So that hosts recognize local IP broadcast packets
- When a device broadcasts to its segment neighbors, it uses a destination address of the local network address with all ones for the host address. In order for this scheme to work, all devices on the segment must agree on which bits comprise the host address.
- So that a local router or bridge recognizes which addresses are local and which are remote Private IP Addresses

If your local network is not connected to the Internet (for example, when using NAT), you can assign any IP addresses to your computers without problems. But to prevent problems and ease configuration, the IANA has reserved the following three blocks of IP addresses specifically for private networks:

10.0.0.0 - 10.255.255.255

172.16.0.0 - 172.31.255.255

192.168.0.0 - 192.168.255.255

We recommend that you choose your private network number from this range. The DHCP server of the SilverStore is preconfigured to automatically assign private addresses.

For more information about address assignment, refer to RFC 1597, Address Allocation for Private Internets, and RFC 1466, Guidelines for Management of IP Address Space. The Internet Engineering Task Force (IETF) publishes RFCs on its Web site at www.ietf.org.

The IP address shortage

The Internet has grown larger than anyone ever imagined it could be. Although the exact size is unknown, the current estimate is that there are about 100 million hosts and more than 350 million users actively on the Internet. In fact, the rate of growth has been such that the Internet is effectively doubling in size each year.

When IP addressing first came out, everyone thought that there were plenty of addresses to cover any need. Theoretically, you could have 4,294,967,296 unique addresses. The actual number of available addresses is smaller (somewhere between 3.2 and 3.3 billion) because of the way that the addresses are separated into classes, and because some addresses are set aside for multicasting, testing or other special uses.

With the explosion of the Internet and the increase in home networks and business networks, the number of available IP addresses is simply not enough. The obvious solution is to redesign the address format to allow for more possible addresses. This is being developed (called IPv6), but will take many years to implement because it requires modification of the entire infrastructure of the Internet.

There are 2 systems in place now to help bring down the shortage of IP addresses.

DHCP

First, most users today have a dynamically given IP address or DHCP address from their provider. This means that the IP address given to you can change over time. This allows the provider to use the IP address for more than one person or device, since people are often online at different times. Optimal usage of IP addresses is guaranteed.

Multiple internal but only one external IP address

A second way to overcome this is to have a single device act on behalf of several other devices. Routers are typical examples. You have several PCs connect to the router, but only the router to the Internet. From an internet perspective, there is only one address. This scheme offers the additional benefit of simple firewall-like protection because the internal LAN addresses are not available to the Internet through the translated connection. All incoming inquiries are filtered out by the router. This filtering can prevent intruders from probing your system. However, using port forwarding, you can allow one PC (for example, a Web server) on your local network to be accessible to outside users.

This works like a receptionist at a large office. Nobody knows your number; they all call the main number of the office and are then forwarded by the receptionist to you.

So how does the receptionist know what number to forward the call too? The caller tells the receptionist what name to look for and the receptionist has a list of names and numbers at her disposal so she can translate the name to the phone extension she needs.

On the Internet, it works exactly the same. NAT (RFC 1631) or Network Address Translation allows a single device, such as a router, to act as an agent between the Internet (or "public network") and a local (or "private") network. This means that only a single, unique IP address is required to represent an entire group of computers.

Network Address Translation

When you visit a website via your computer, your router, or more specifically your NAT, remembers which computer on the internal network asked for the information. When the information (in this case the website you asked for) comes back, the router knows which computer on the internal network to send the information to. This is Network Address Translation or NAT.

Developed by Cisco, Network Address Translation is used by a device (firewall, router or computer) that sits between an internal network and the rest of the world. For more information about IP address translation, refer to RFC 1631, The IP Network Address Translator (NAT).

Hosting a server

What If I want to host a server?

For others to be able to view your pictures on your computer, you need to run some type of service or server. A web server such as apache will allow others to securely watch the pictures or files on your site. But how does the NAT of your router know this time to which computer to forward the information?

Since the request comes from the internet, most routers are setup to disallow any traffic going into the internal network. (Firewall protection) In this case, since we want people to be able to see our pictures, we want the router to forward this information. We have to tell the router to do this.

Someone calling from the internet asks your router for a certain "port". This is the same as someone calling the receptionist and requesting a certain person by name. Ports are displayed as numbers but invariably map to pre described services. For instance, when someone requests a web page, they always ask for the service on port 80, the web server. Through NAT, it is possible to "map" a certain request for a service (a request for a port) to a certain PC on the internal network.

MAC Addresses and Address Resolution Protocol

An IP address alone cannot be used to deliver data from one LAN device to another. To send data between LAN devices, you must convert the IP address of the destination device to its media access control (MAC) address. Each device on an Ethernet network has a unique MAC address, which is a 48-bit number assigned to each device by the manufacturer. The technique that associates the IP address with a MAC address is known as address resolution. Internet Protocol uses the Address Resolution Protocol (ARP) to resolve MAC addresses. If a device sends data to another station on the network and the destination MAC address is not yet recorded, ARP is used. An ARP request is broadcast onto the network. All stations on the network receive and read the request. The destination IP address for the chosen station is included as part of the message so that only the station with this IP address responds to the ARP request. All other stations discard the request.

The station with the correct IP address responds with its own MAC address directly to the sending device. The receiving station provides the transmitting station with the required destination MAC address. The IP address data and MAC address data for each station are held in an ARP table. The next time data is sent, the address can be obtained from the address information in the table.

Ethernet Cabling

There are two different types of cabling for Ethernet networks. Originally they used thick or thin coaxial cable, but most installations currently use unshielded twisted pair (UTP) cabling. The UTP cable contains eight conductors, arranged in four twisted pairs, and terminated with an RJ45 type connector. There are 2 types of RJ-45 cables available today, the Media Dependent Interface (MDI) cable and the Media Dependent Interface - Crossover (MDI-X) cable. The first cable is used to connect routers to PCs and the second to connect PCs directly to PCs. The sent and receive wires are switched from beginning to end in the crossover cables. Some Ethernet switch products, such as the SilverStore, are able to sense the polarity of a connection and automatically adapt to the proper cabling type.

Cable Quality

A twisted pair Ethernet network operating at 10 Mb/s (10BASE-T) will often tolerate low quality cables, but at 100 Mb/s (10BASE-Tx) the cable must be rated as Category 5, or "Cat 5", by the Electronic Industry Association (EIA). This rating will be printed on the cable jacket. A Category 5 cable will meet specified requirements regarding loss and crosstalk. In addition, there are restrictions on maximum cable length for both 10 and 100 Mb/s networks.

We thank you for purchasing this Freecom product and hope you will enjoy using it. In order to avoid unnecessary inconvenience on your part, we suggest reading the quick install guide, instruction manual and any additional electronic and or printed manuals. When problems occur we have a database with Frequently Asked Questions (FAQ) on our Freecom website (www.freecom.com), please check this site before you contact the helpdesk.

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This guarantee covers only the hardware components packaged with the product. This guarantee covers none of the following: (a) any consumable supplied with the product, such as media or batteries; (b) damage to or loss of any software programs, data or removable storage media; (c) any damage resulting from adaptations, changes or adjustments, which may have been made to the product, without the prior written consent of Freecom; (d) attempted repair by any party other than authorized by Freecom and (e) accidents, lightning, water, fire or any other such cause beyond the reasonable control of Freecom.

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Package	Version	License (LicenseVersion)
acl	2.2.47	GPL
attr	2.4.43	GPL
bar	1.11.0	GPL v2
bash	3.2.48	GPL
busybox	1.17.2	GPL
<i>codex</i>	<i>0.1</i>	<i>public domain</i>
cryptsetup	1.1.3	GPL v2
curl	7.17.1 libcurl 4.0.1	MIT License
db	4.6.21	Open Source License for Oracle Berkeley DB
dirvish	1.2.1	Open Software License version 2.0
dosfstools	3.0.10	GPL
e2fsprogs	1.41.12	GPL, GPL v2, BSD
ethtool	6	GPL v2
expat	1.95.8	<i>Thai Open Source Software Center</i>
findutils	4.4.2	GPL
flex	2.5.35	BSD
freetype	2.4.3	BSD/GPL dual license
gdb	7.2	GPL v2, GPL v3
gdbm	1.8.3	GPL v2
glib	2.24.2	GPL v2
hdparm	9.30	BSD
heimdal	1.4	3-clause BSD license
howl	1.0.0	BSD
iscsi-scst	2.0.1	GPL v2
ifplugd	0.28	GPL v2
inadyn	1.96.2	GPL
inotify-tools	3.13	GPL v2
jpeg	8b	Public domain
jQuery	1.4.2	GPL, MIT
jQueryUI	1.8.4	GPL
libdaemon	0.14	GPL v2.1
libevent	1.4.13	3-clause BSD license
libgcrypt	1.4.6	GPL v2, GPL v2.1
libgpg-error	1.10	GPL v2, GPL v2.1
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libusb	0.1.12	LGPL v2.1
libxml2	2.7.7	MIT License
libzdb	2,7	GPL v3
lighttpd	1.4.28	BSD
Linux kernel	2.6.31.8 / with Marvell LSP 5.1.3	GPL
Linux-PAM	1.1.2	GPL
logrotate	3.7.9	GPL
mdadm	3.1.4	GPL v2
mt-daapd	0.2.4.2	GPL v2
ncurses	5,6	GPL v2
netatalk	2.1.5	GPL
nfs-utils	1.2.3	GPL v2
ntfs-3g	2011.04.12	GPL v2
ntp	4.2.6p3	Public domain
openldap	2.4.23	The OpenLDAP Public License
openssh	5.6p1	BSD
openssl	1.0.0d	BSD
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perl	5.12.2	GPL
php	5.3.2	PHP License v3.01, copyright (c) the PHP Group BSD-style license
popt	1.16	GPL
portmap	6.0	BCD, UCB
proftpd	1.3.3d	GPL v2
quota	3.17	BSD
readline	6,1	GPL v3
rsync	3.0.7	GPL v3
rTorrent	0.8.6	GPL
samba	3.5.6	GPL
screen	4.0.3	GPL v2
scst	2.0.0.1	GPL v2
scstadmin	2.0.0	GPL v2
shadow	4.1.1	BSD
smartmontools	5.38	GPL v2
sqlite	3.7.2	Public Domain
tcp_wrappers	7.6	BSD
u-boot	3.5.9 in LSP 5.1.3	GPL v2
udev	125	GPL v2
usbutils	0.82	GPL v2
util-linux	2.12r	GPL v2, UCB

wget	1.12	GPL v3
xfspgrog	3.1.3	GPL
xmlrpc-c	1.06.42	BSD
zlib	1.2.5	BSD
C library	Use cs2009q3-67 default: 2.10.1	GPL
gcc	Use cs2009q3-67 default: 4.4.1	GPL

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```
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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>
Copyright (C) <year>  <name of author>
```

```
This program is free software; you can redistribute it and/or modify
it under the terms of the GNU General Public License as published by
the Free Software Foundation; either version 2 of the License, or
(at your option) any later version.
```

```
This program is distributed in the hope that it will be useful,
but WITHOUT ANY WARRANTY; without even the implied warranty of
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
GNU General Public License for more details.
```

```
You should have received a copy of the GNU General Public License along
with this program; if not, write to the Free Software Foundation, Inc.,
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA.
```

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

```
Gnomovision version 69, Copyright (C) year name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show
w'.
```

```
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Lesser General Public License instead of this License.

LGPL Version 3.0

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other than an Application or a Combined Work as defined below.

An "Application" is any work that makes use of an interface provided
by the Library, but which is not otherwise based on the Library.
Defining a subclass of a class defined by the Library is deemed a mode
of using an interface provided by the Library.

A "Combined Work" is a work produced by combining or linking an
Application with the Library. The particular version of the Library
with which the Combined Work was made is also called the "Linked
Version".

The "Minimal Corresponding Source" for a Combined Work means the
Corresponding Source for the Combined Work, excluding any source code
for portions of the Combined Work that, considered in isolation, are
based on the Application, and not on the Linked Version.

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If you modify a copy of the Library, and, in your modifications, a
facility refers to a function or data to be supplied by an Application
that uses the facility (other than as an argument passed when the
facility is invoked), then you may convey a copy of the modified
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- a) under this License, provided that you make a good faith effort to
ensure that, in the event an Application does not supply the

function or data, the facility still operates, and performs whatever part of its purpose remains meaningful, or

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The object code form of an Application may incorporate material from a header file that is part of the Library. You may convey such object code under terms of your choice, provided that, if the incorporated material is not limited to numerical parameters, data structure layouts and accessors, or small macros, inline functions and templates (ten or fewer lines in length), you do both of the following:

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b) Accompany the object code with a copy of the GNU GPL and this license document.

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c) For a Combined Work that displays copyright notices during execution, include the copyright notice for the Library among these notices, as well as a reference directing the user to the copies of the GNU GPL and this license document.

d) Do one of the following:

0) Convey the Minimal Corresponding Source under the terms of this License, and the Corresponding Application Code in a form suitable for, and under terms that permit, the user to recombine or relink the Application with a modified version of the Linked Version to produce a modified Combined Work, in the manner specified by section 6 of the GNU GPL for conveying Corresponding Source.

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e) Provide Installation Information, but only if you would otherwise

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You may place library facilities that are a work based on the Library side by side in a single library together with other library facilities that are not Applications and are not covered by this License, and convey such a combined library under terms of your choice, if you do both of the following:

- a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities, conveyed under the terms of this License.
- b) Give prominent notice with the combined library that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

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