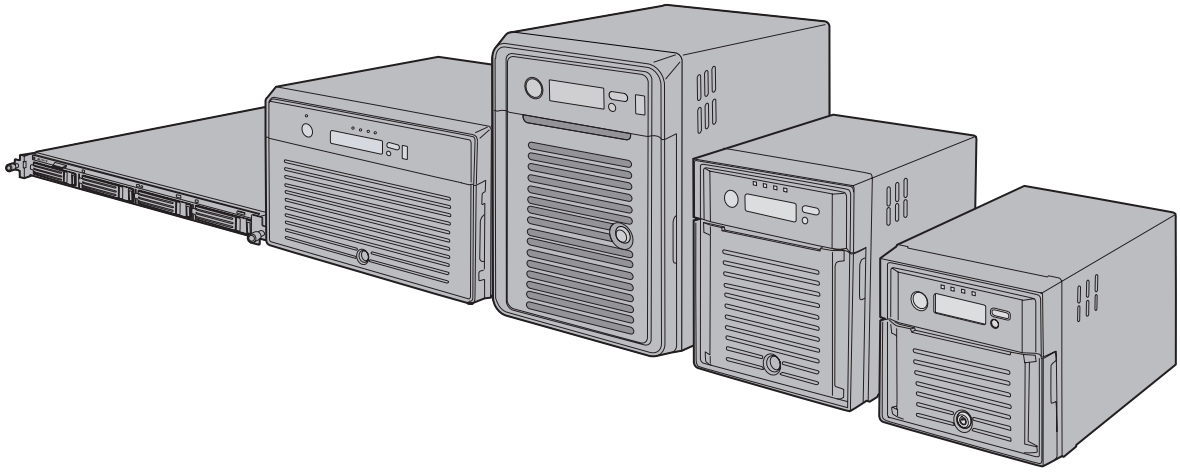
BUFFALO™

Network Attached Storage

TeraStation 5000 and 5000N

User Manual



Please make sure to read this manual before using and follow the procedures. If you have any inquiries about the product, contact the number on the warranty statement or the packing box. Do not discard this manual, the warranty statement, or the packing box.

Americas: www.buffaloamericas.com
Europe: www.buffalo-technology.com
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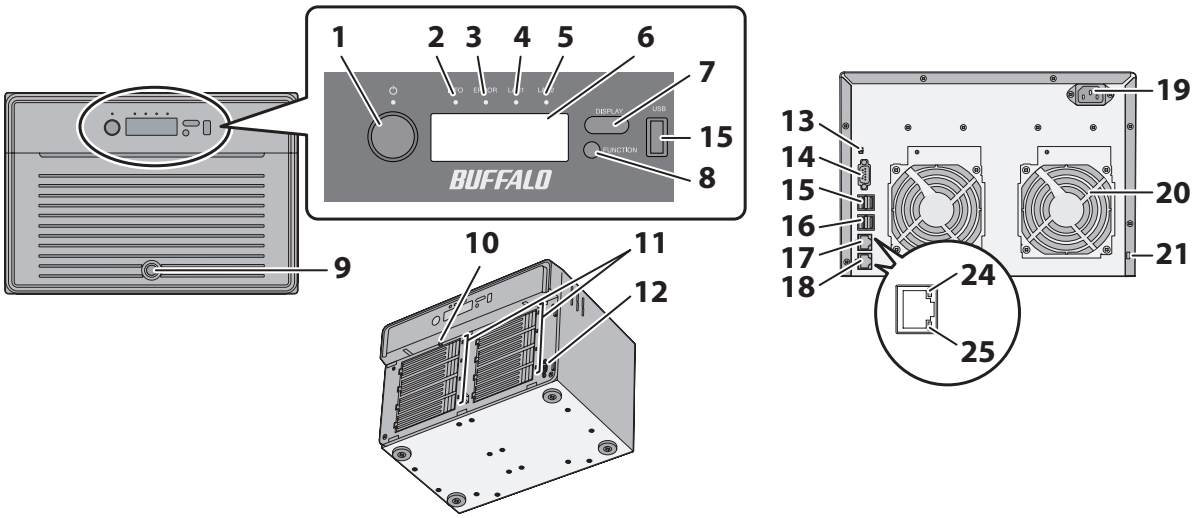
Chapter 1 Getting Started

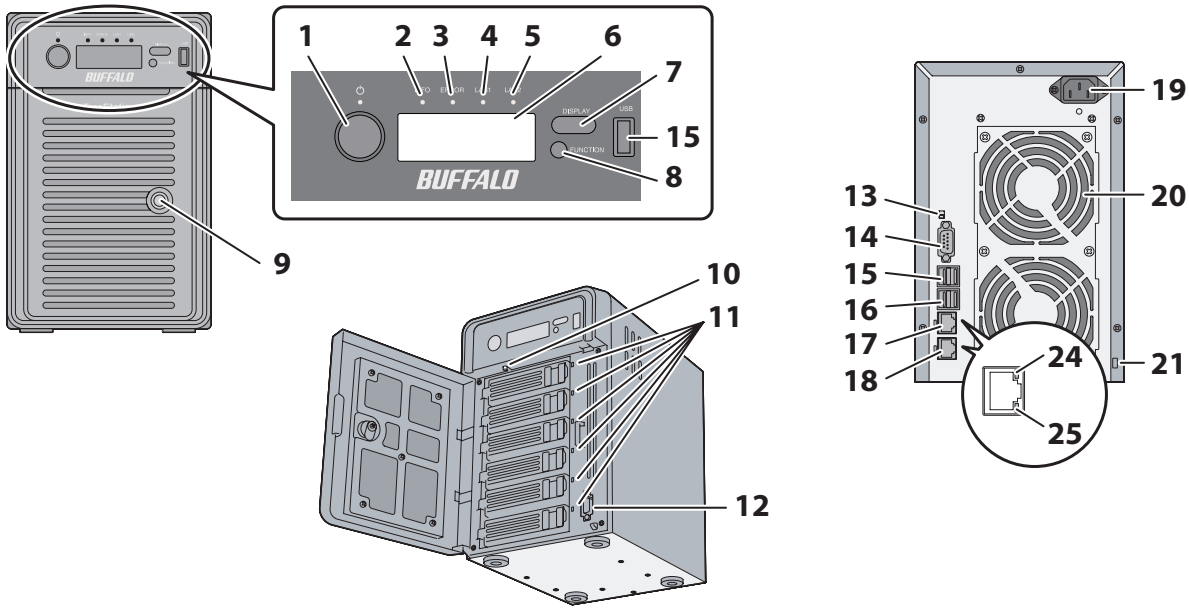
Diagrams

Depending on the number or type of drives in the unit, the model name will be different. Check the sticker on the packing box for your unit's model name.

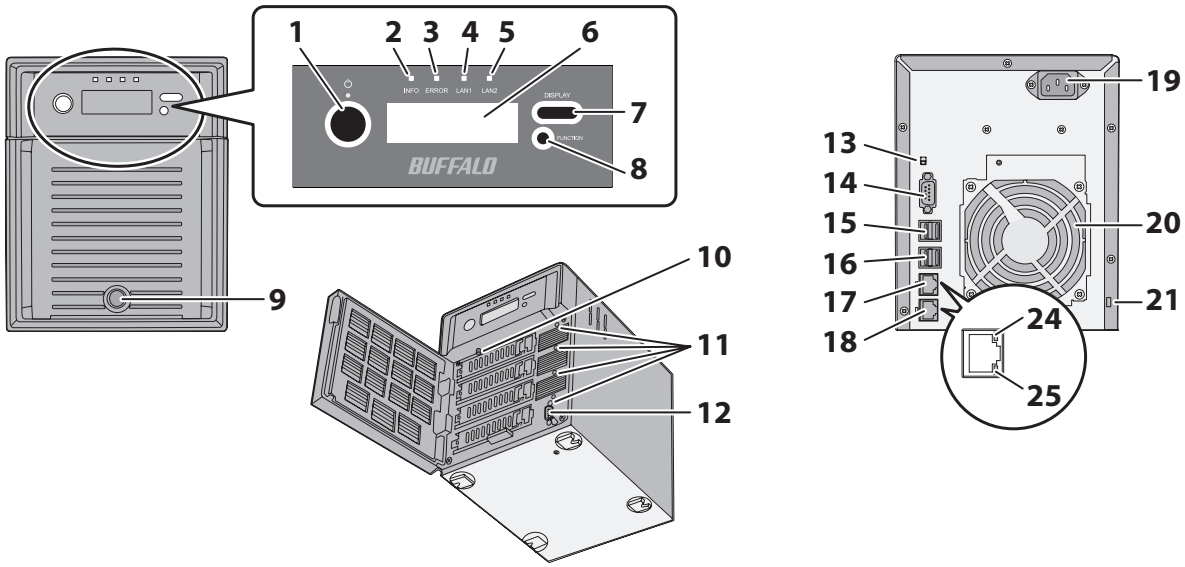
TS5800D, TS5800DN, TS5800DWR



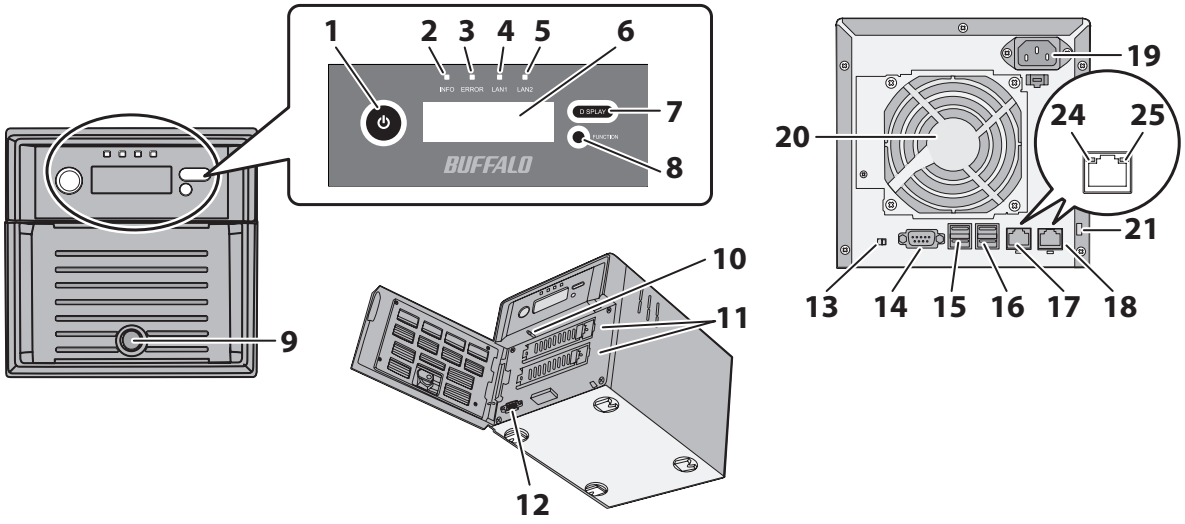
TS5600D, TS5600DN



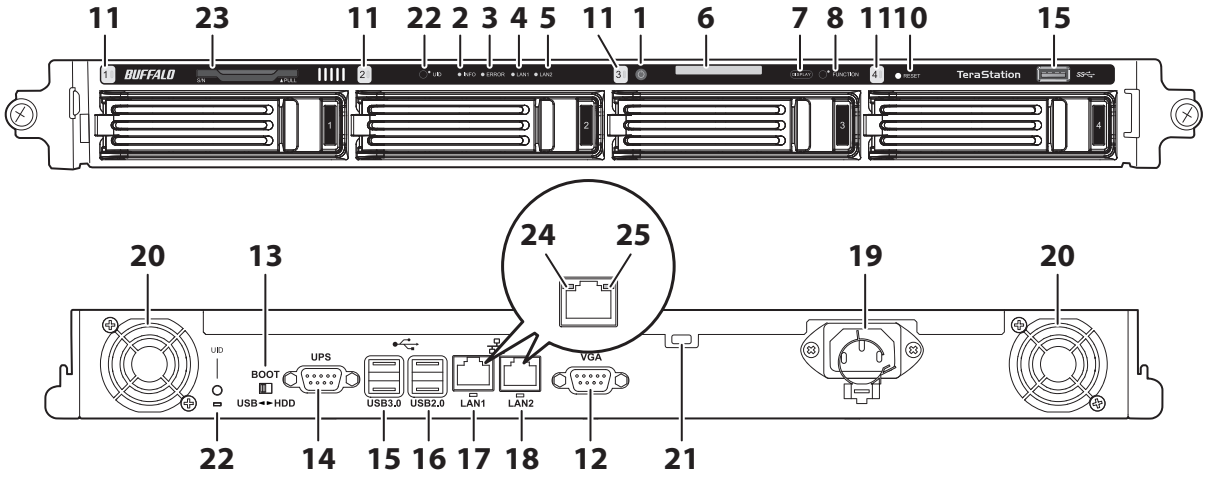
TS5400D, TS5400DN, TS5400DWR



TS5200D, TS5200DN, TS5200DWR



TS5400R, TS5400RH, TS5400RN, TS5400RWR



1 Power Button ( )

To power on, connect the power cable and wait for 10 seconds, then press the power button. To power off, press the power button twice.

2 Info LED

If there is a status message, the amber info LED will light up. Check the LCD panel to see the status message.

3 Error LED

If there is an error, the red error LED will light up. Check the LCD panel to see the error message.

4 LAN1 LED

When LAN port 1 is connected, this LED glows green. It blinks when the connection is active.

5 LAN2 LED

When LAN port 2 is connected, this LED glows green. It blinks when the connection is active.

6 LCD Panel

This display shows the status of many TeraStation settings. It also displays errors and messages when available.

7 Display Button

Switches between the different display modes. Also, if the TeraStation is beeping, press this button to stop it.

8 Function Button

Use this button for Direct Copy, dismounting USB devices, rebuilding RAID arrays, and configuring failover.

9 Drive Lock ( )

Open the front panel with the key to replace hard drives or access the reset button.

10 Reset Button

To shut down and reboot the TeraStation, hold down the reset button.

11 Status LEDs

Normally, these LEDs blink green when hard drives are accessed. If a drive fails, its LED will turn red or amber.

12 VGA Port

Factory use only.

13 Boot Mode Switch

Leave the switch in the HDD position during normal operation. To recover settings, insert the recovery USB drive into a USB 2.0 port, move the boot switch to the USB position, and press the power button.

14 UPS Port

Connect to a UPS.

15 USB 3.0 Port ( )

Compatible Buffalo USB 3.0 hard drives can be connected. USB hubs are not supported.

16 USB 2.0 Port ( )

Compatible Buffalo USB hard drives, USB flash drives, digital cameras, and USB UPS connections can be connected. USB hubs are not supported.

17 LAN Port 1 ( )

Use an Ethernet cable to connect this port to your network.

18 LAN Port 2 ( )

This second Ethernet port may be used for network redundancy or backup. You may connect a second TeraStation directly to this port for backup.

19 Power Connector

Use the included power cable to connect to an UPS, surge protector, or outlet.

20 Fan

Spins to avoid overheating inside. Do not block the fan.

21 Anti-Theft Security Slot ( )

Use this slot to secure your TeraStation with a cable lock (not included).

22 UID Button

Press the UID button on the front or the back of the unit to cycle the blue LED on and off.

23 Serial Number

This sticker shows the TeraStation's serial number.

24 Link LED

Glows amber when the unit is connected to a network.

25 Act LED

This LED shows network activity. It blinks amber when the TeraStation is accessed over the network.

Turning the TeraStation On and Off

Press the power button on the TeraStation to turn it on.

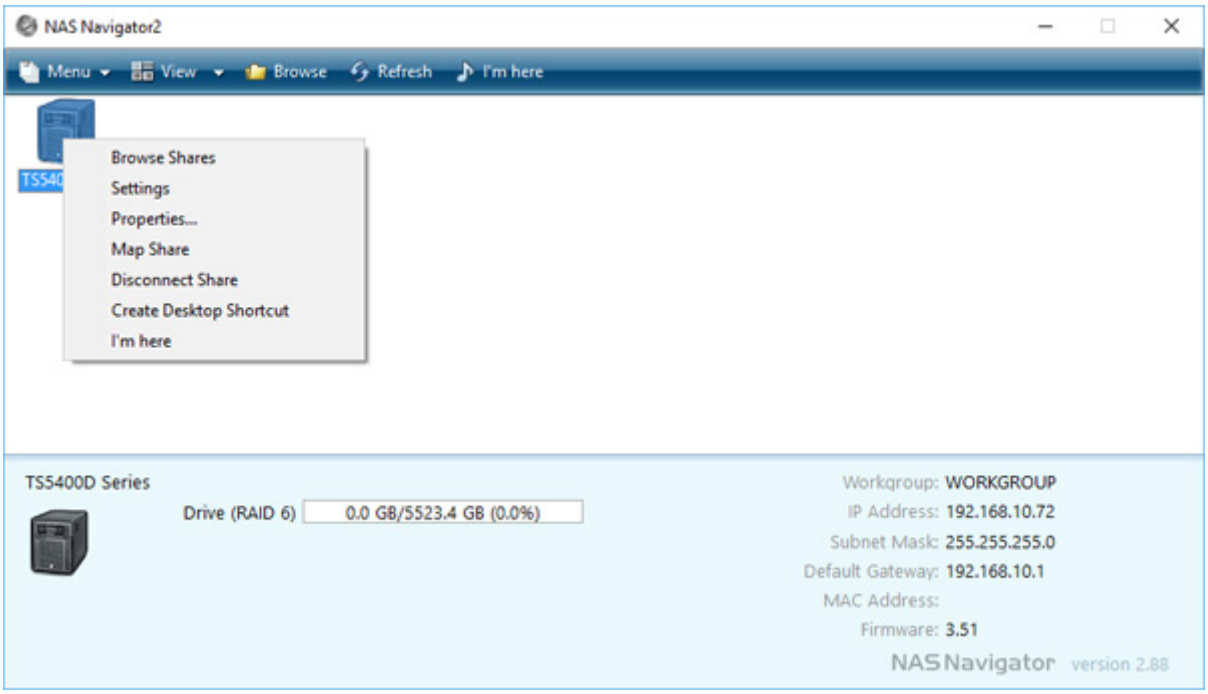
To turn off the TeraStation, press the power button twice. Don't unplug the TeraStation without turning it off first.

You can also shut it down and restart it remotely from Settings.

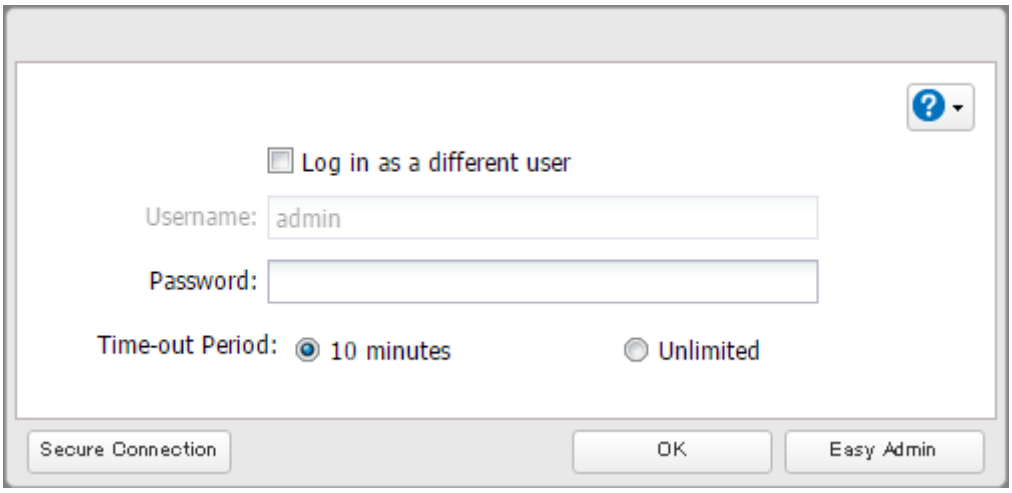
Note: This section uses the TS5400D as an example; the procedure below can be used with other TeraStation models as well.

1 Double-click the  icon to start NAS Navigator2.

2 Right-click your TeraStation's icon and select *Settings*. For macOS, select the TeraStation's icon while holding down the control key, then select *Settings*.

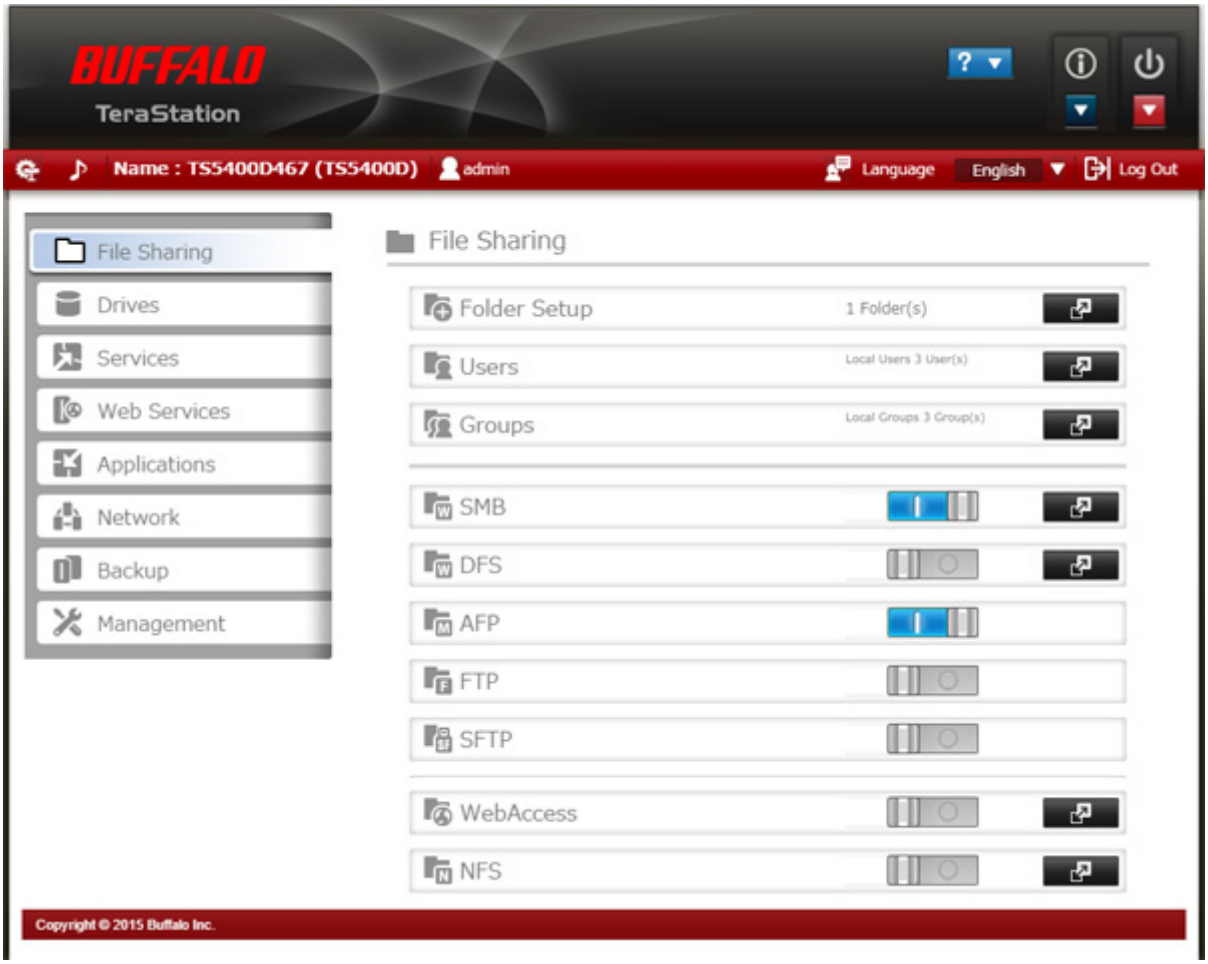


3 Enter the username and password, then click *OK*.

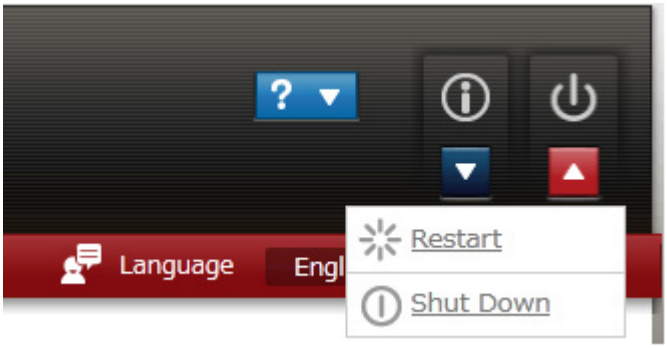


Note: The default username and password are "admin" and "password".

4 Settings will open.



5 Click  at the top-right of Settings and choose *Shut Down*.



6 Click *Yes*.

7 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

When all the LEDs on the front of the TeraStation turn off, the shutdown process is complete.

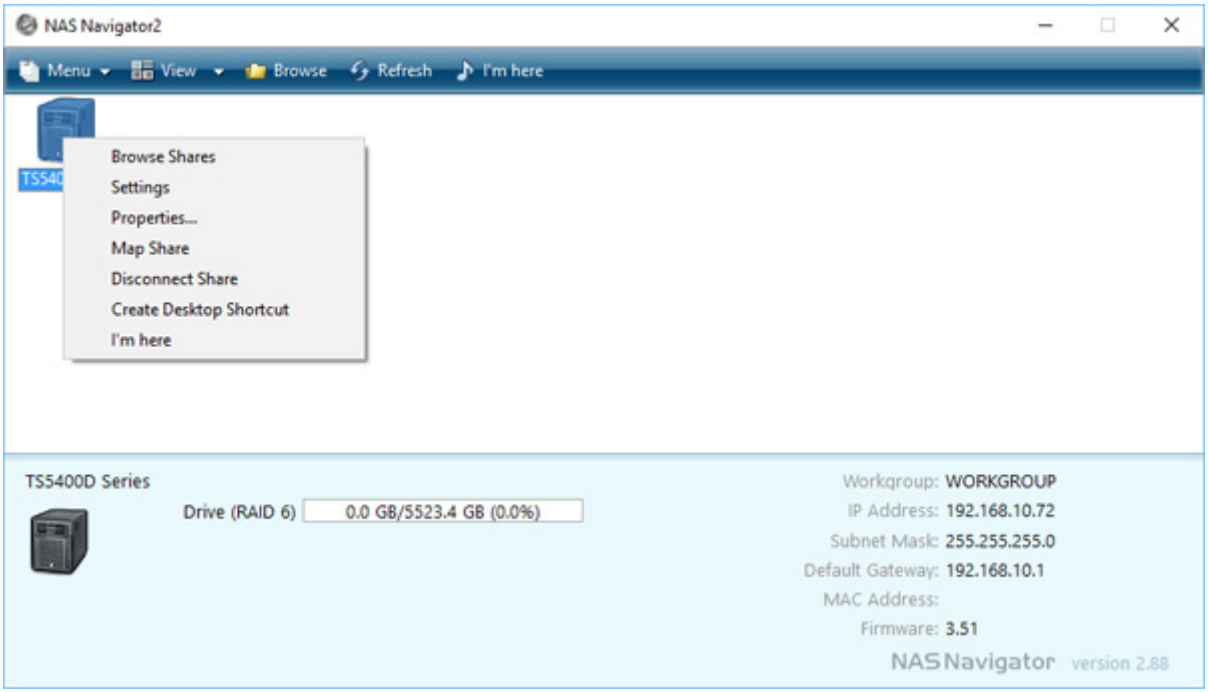
Changing the Administrator Password

After initial setup, follow this procedure to change your password.

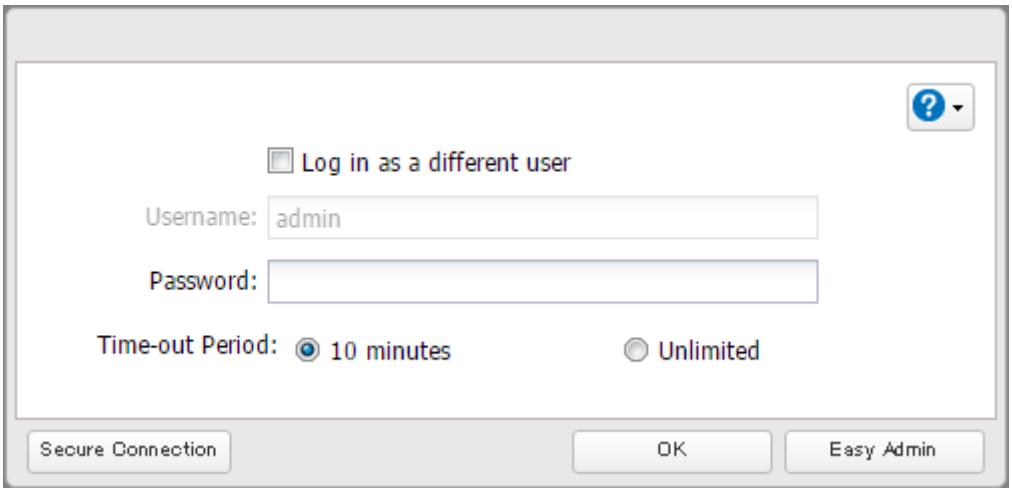
Note: This section uses the TS5400D as an example; the procedure below can be used with other TeraStation models as well.

1 Double-click the  icon to start NAS Navigator2.

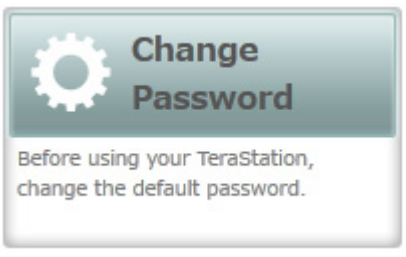
2 Right-click on your TeraStation's icon and select *Settings*. On the Mac, select the TeraStation's icon while holding down the control key, then select *Settings*.



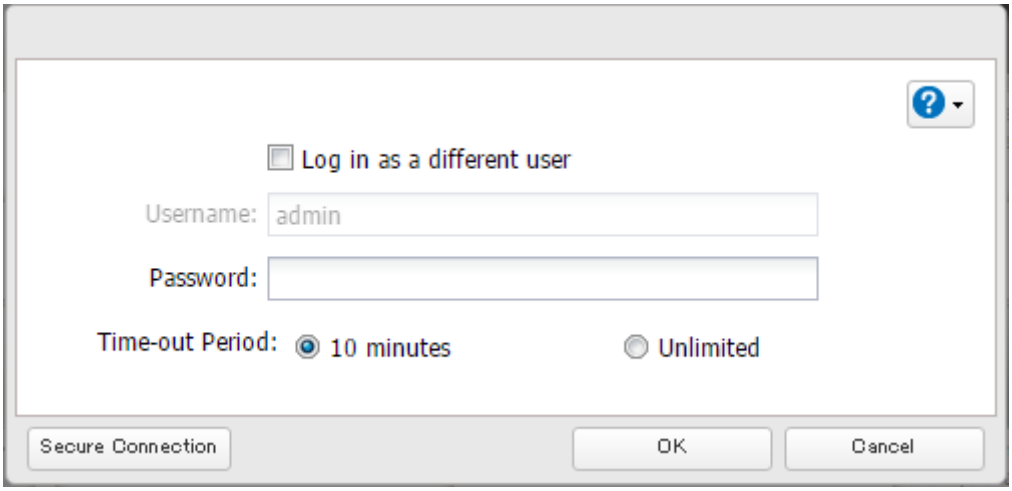
3 Click *Easy Admin*.



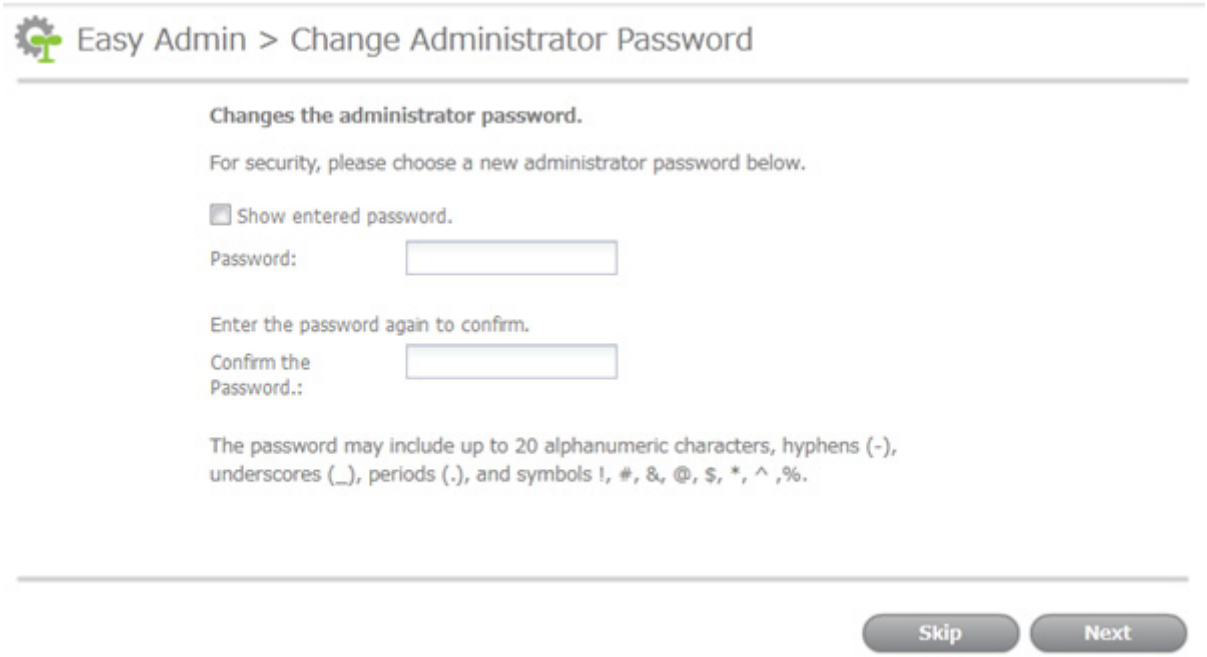
4 Click *Change Password*.



5 If this screen is displayed, enter the current password and click *OK*. The default password is "password".



6 Enter the new password (twice) and click *Next*.



7 Click *OK*. You have changed the admin password.

Creating a Recovery Drive

To initialize all of the TeraStation's settings, or just restore the admin password to its factory default value, create a recovery drive as described below.

For Initializing Settings

A system initialization drive can reset all settings to their default values.

Notes:

- Normally, creating and using a system initialization drive will not affect data on the TeraStation. However, always back up your data regularly!
- This USB drive can be used to recover the system if your TeraStation doesn't boot at all. In this case, if the data partition is damaged, then all your data will be deleted by the recovery process.

1 Insert a 1 GB or larger USB drive into a USB port on the TeraStation.

Note: All data on the USB flash drive will be erased!

2 In Settings, navigate to *Management - Restore/Erase - USB Options*.

3 Select "Create a USB drive for initializing settings".

4 Select the USB drive from "Target USB drive", then click *Execute*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*. The TeraStation will create the initialization drive. This will take about a minute.

6 When the "finished" dialog opens, the USB initialization drive is ready to use. Dismount the USB drive before unplugging it. See the "Dismounting Drives" section in chapter 4 for the procedure on dismounting drives.

For Resetting Password

A password initialization drive can reset the administrator password to its default value ("password"). This could be very useful if you forget your admin password.

1 Insert a 1 GB or larger USB drive (not included) to a USB 2.0 port on the TeraStation.

Note: All data on the USB flash drive will be erased!

2 In Settings, navigate to *Management - Restore/Erase - USB Options*.

3 Select "Create a USB drive for resetting the admin password".

4 Select the USB drive from "Target USB drive" list, then click *Execute*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*. The TeraStation will create the password reset drive. This will take about a minute.

6 When the "finished" dialog opens, the USB password reset drive is ready to use. Dismount the USB drive before unplugging it. See the "Dismounting Drives" section in chapter 4 for the procedure on dismounting drives.

For procedure on using system initialization or password initialization drives, see the "Restoring Factory Defaults" or "Resetting the Administrator Password" sections in chapter 10.

Chapter 2 Configuration

Configure and manage your TeraStation using the Settings interface, accessible from a browser window. Open the interface using the procedure below or type the TeraStation's IP address in the URL field of your browser. Within Settings, the Easy Admin page gives you quick access to commonly used settings.

Note: Microsoft Edge, Firefox, Google Chrome, Internet Explorer 9 or later, and Safari 9 or later are supported. If you have difficulty viewing Settings, check the following:

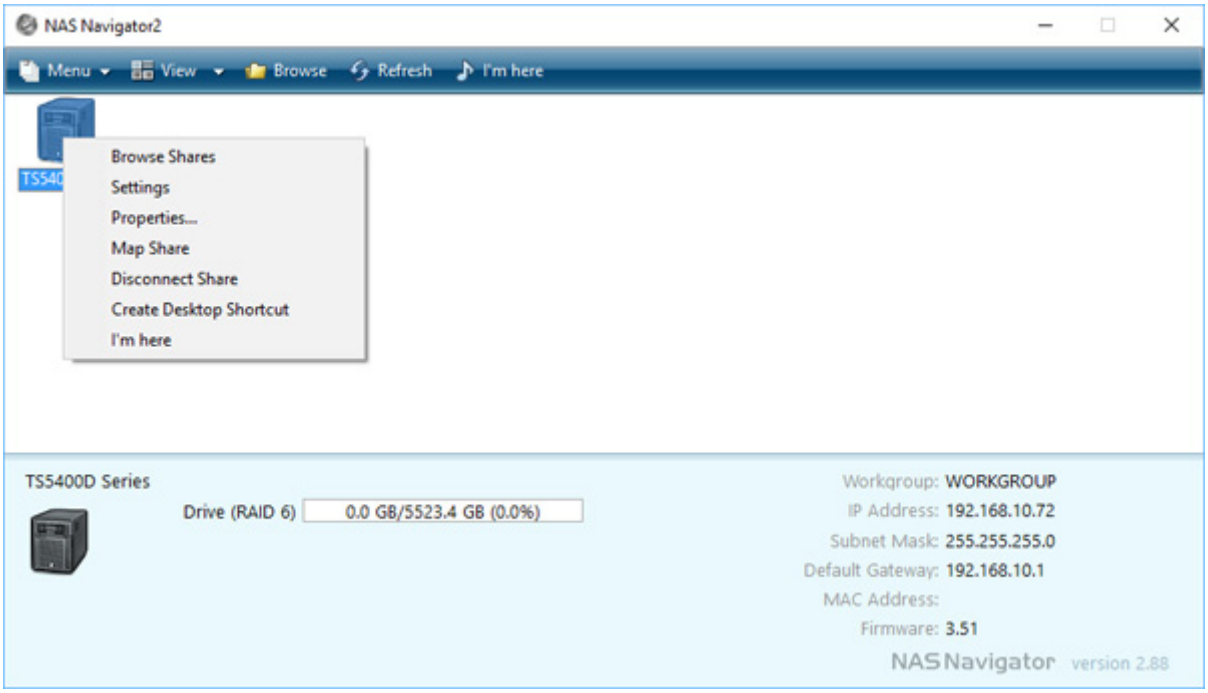
- If there are a large number of registered users, groups, or shared folders, use another browser instead of Internet Explorer.
- If you have a proxy server enabled in the browser settings, disable the proxy server.
- With Internet Explorer, set security to *Local intranet*. On Windows Server operating systems, higher-level security is configured by default. Set the security to a lower level temporarily.
- On a Mac, you can also use Bonjour to log in to Settings. Navigate to *Bookmarks - Bonjour - TeraStation name* from the menu bar of Safari. If you don't see "Bonjour" in the Bookmarks menu, click *Safari - Preferences* and select "Include Bonjour in the Bookmarks menu" under "Advanced".

Opening Advanced Settings

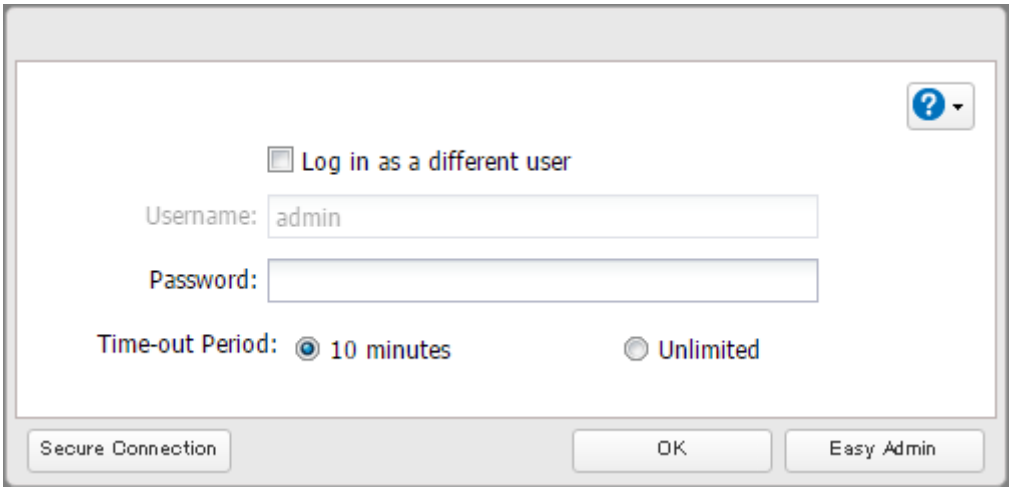
Note: This section uses the TS5400D as an example; the procedure below can be used with other TeraStation models as well.

1 Double-click the  icon to start NAS Navigator2.

2 Right-click on your TeraStation's icon in NAS Navigator2 and select *Settings*. For macOS, click your TeraStation's icon while holding down the control key, then select *Settings*.



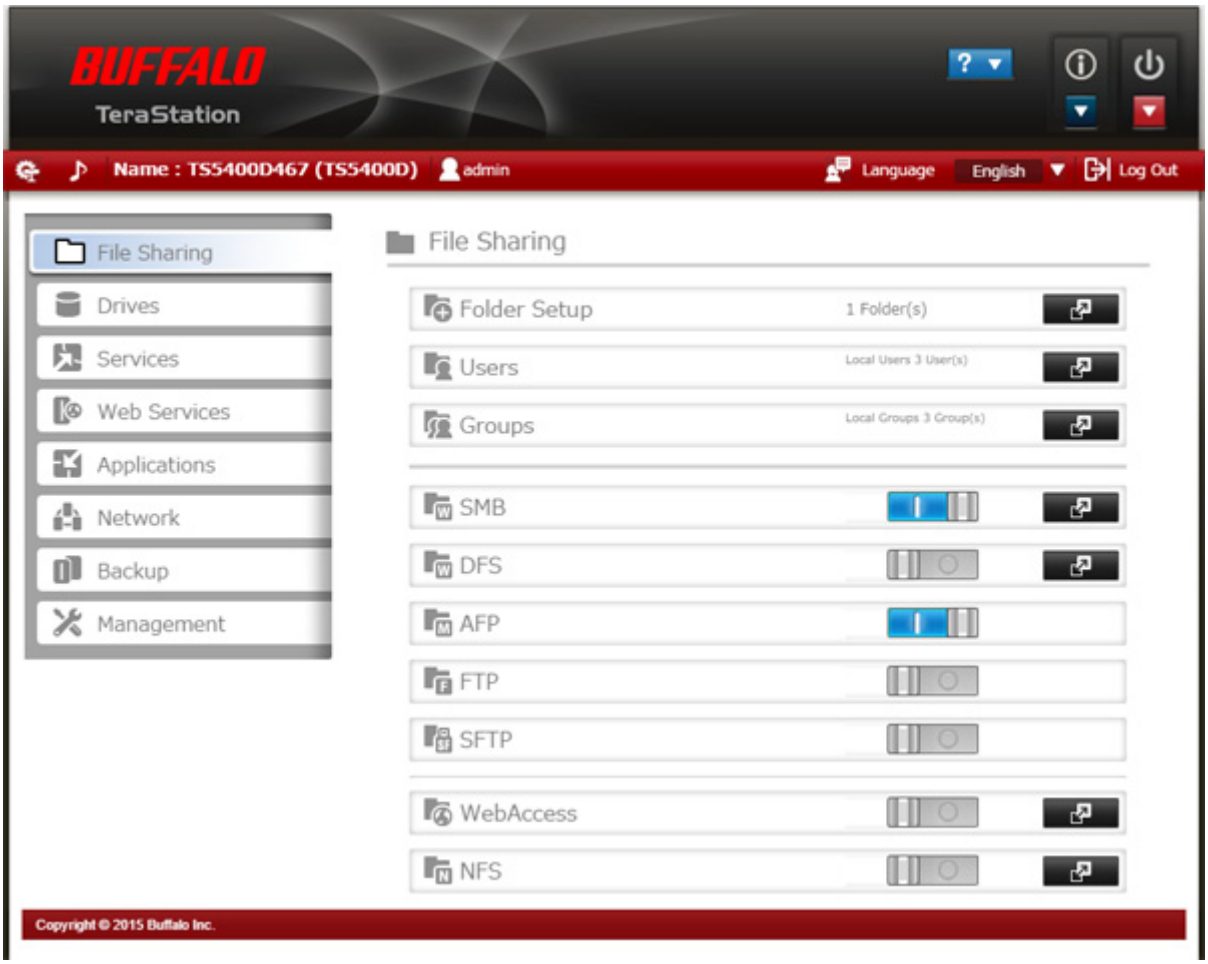
3 Enter the username and password and click *OK*.



Notes:

- If the time-out period is set to "10 minutes", you will be logged out of Settings after 10 minutes of inactivity.
- Click *Secure Connection* to log in with an encrypted connection.

4 Settings will open.



Notes:

- Username/Password Combinations:

Username	Password	Settings Available
admin	password	All
guest	blank	System information (read-only)

Username	Password	Settings Available
Your username	Your password	If a user is assigned as an administrator, all settings are available. If assigned under another group, only system information (read-only) is available.

- Click  to open Easy Admin.
- Click  to play a tone from the TeraStation for easy location.

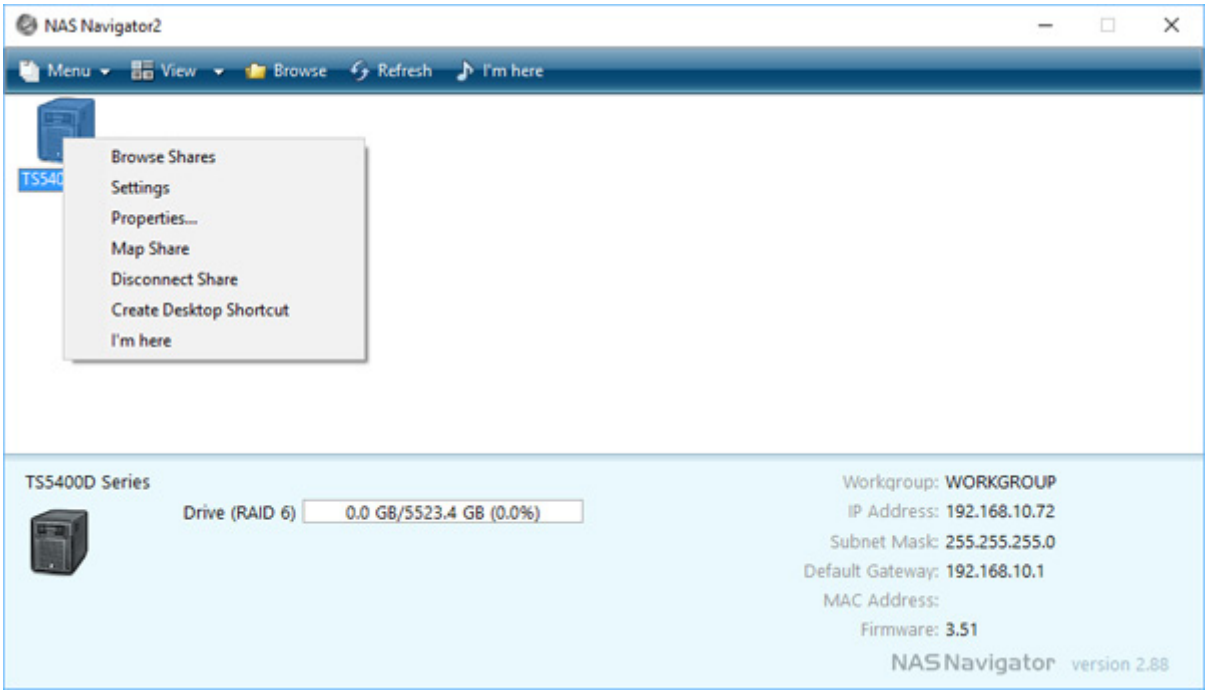
Opening Easy Admin

The Easy Admin page makes it easy to change common settings. Follow the procedure below to open Easy Admin.

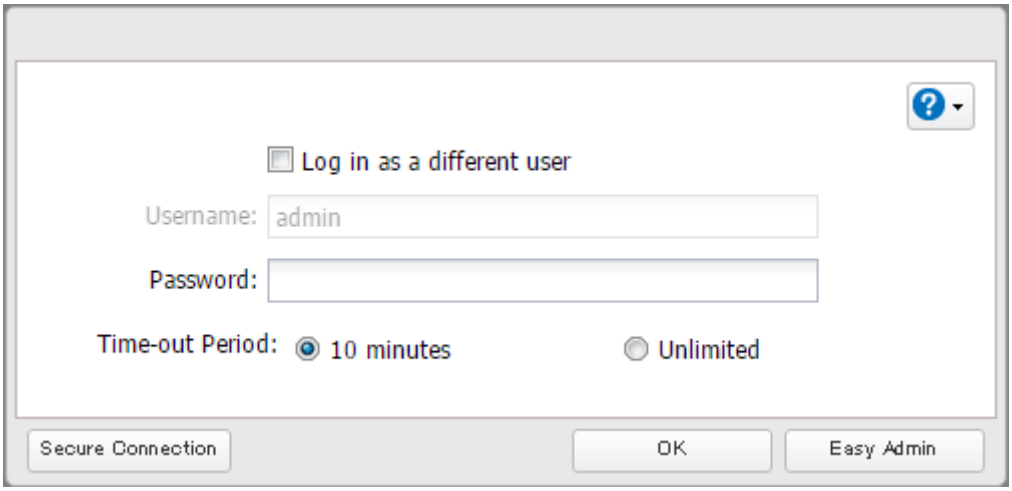
Note: This section uses the TS5400D as an example; the procedure below can be used with other TeraStation models as well.

1 Double-click the  icon to start NAS Navigator2.

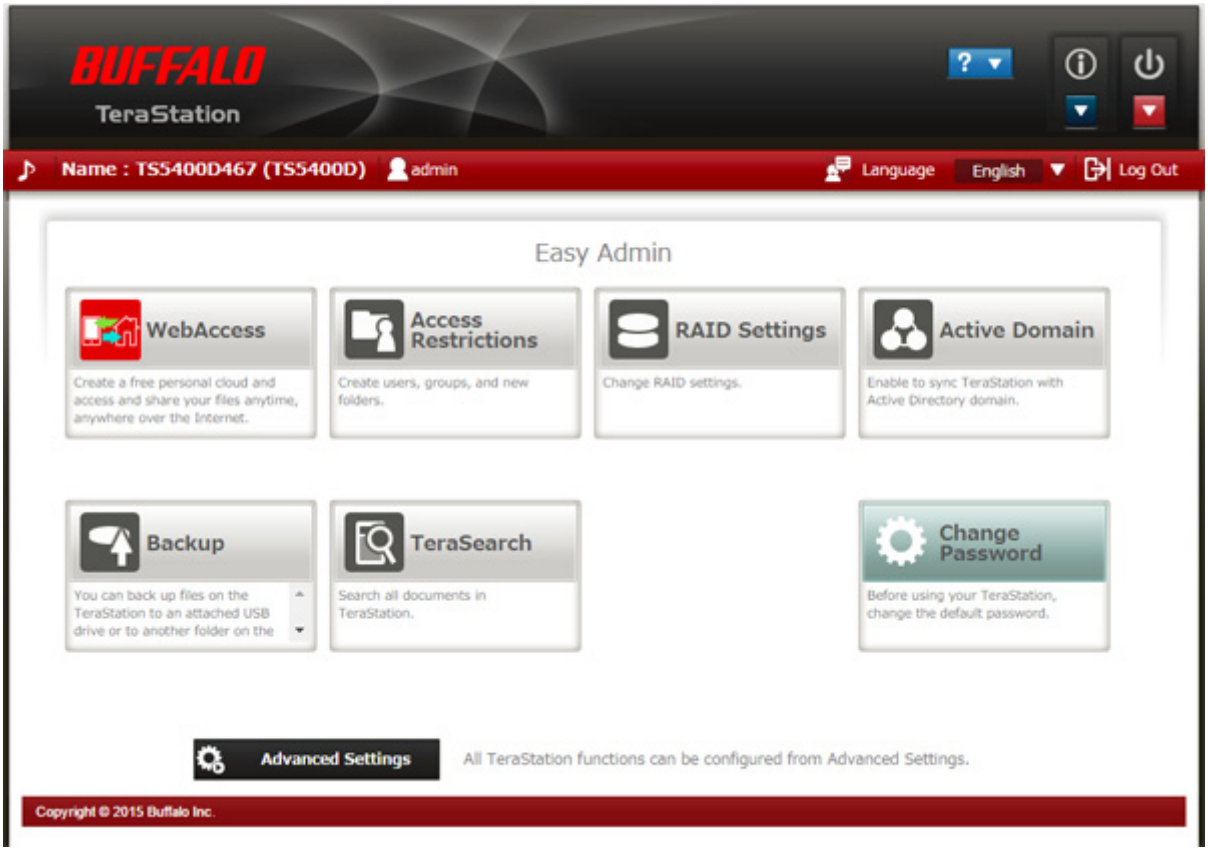
2 Right-click on your TeraStation's icon and choose *Settings*. For macOS, click the TeraStation icon while holding down the control key, then select *Settings*.



3 Click *Easy Admin*.



4 The Easy Admin screen will open.



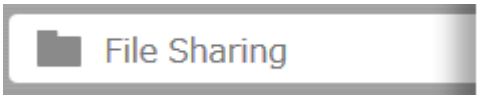
Note: If you click any buttons, you will need to enter a username and password.

Chapter 3 Sharing Files

Configuring Shared Folders

Adding a Shared Folder

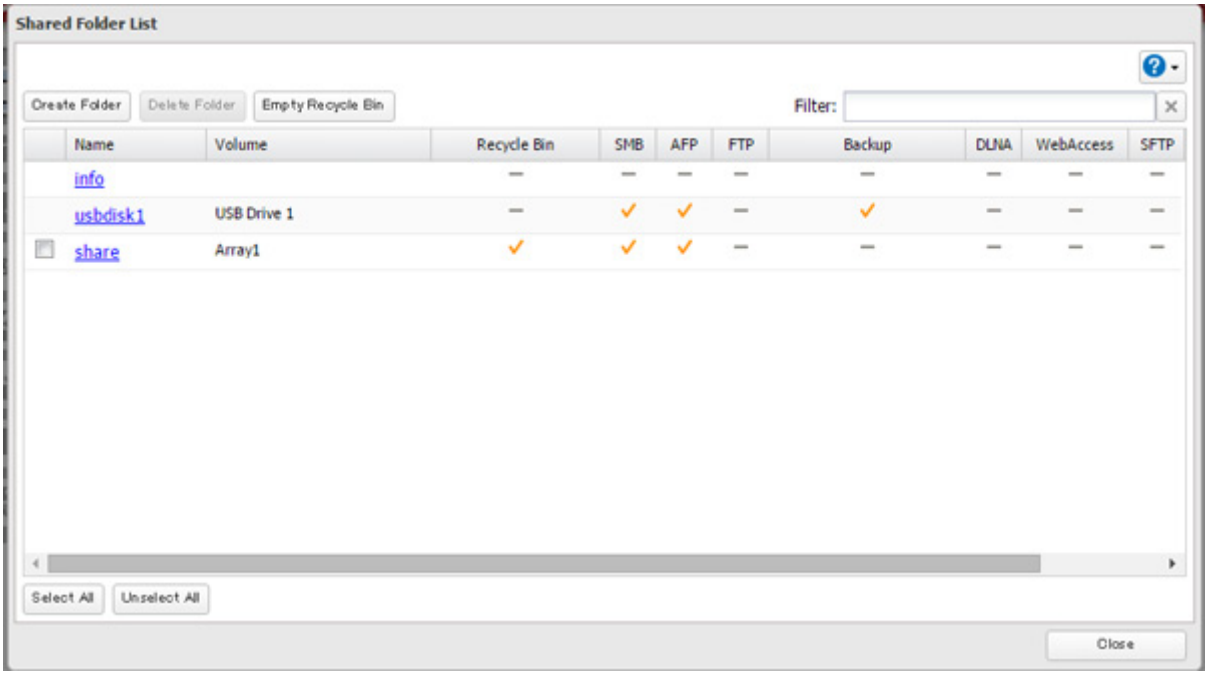
1 In Settings, click *File Sharing*.



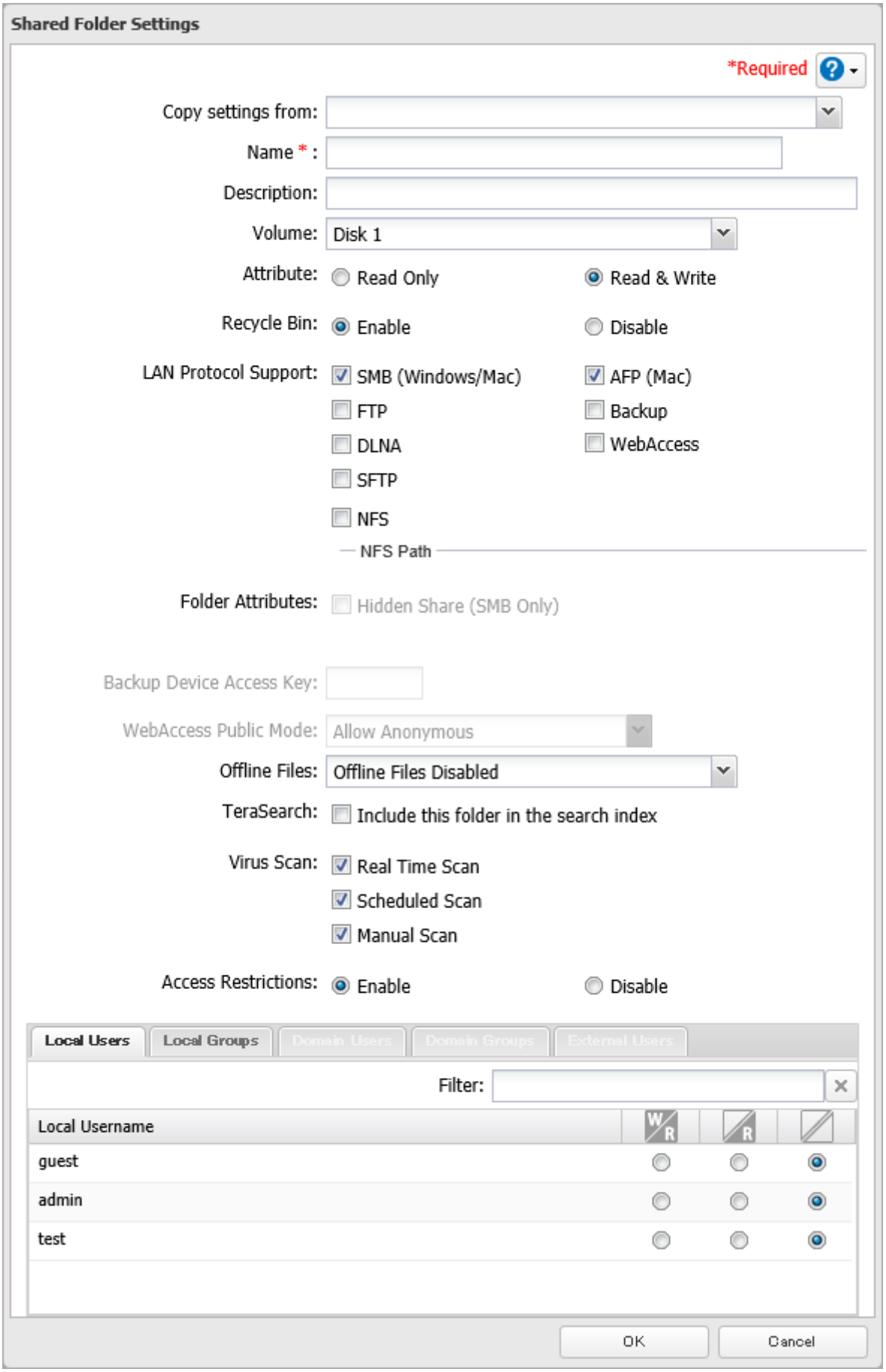
2 Click  to the right of "Folder Setup".



3 Click *Create Folder*.



4 Configure the desired settings, then click *OK*.



Notes:

- Names may contain up to 27 alphanumeric characters, hyphens (-), and underscores (_). The first character should not be a symbol.
- Descriptions may contain up to 75 alphanumeric characters, hyphens (-), underscores (_), and spaces. The first character should not be a symbol or space.
- You may create up to 400 shared folders.
- If the names of shared folders accessed via AFP and FTP connections contain multibyte characters, configure the client language in *Management - Name/Time/Language* to match the characters. If the setting does not match, the shared folder name will not be displayed correctly.
- The following characters are handled differently by macOS and Windows. Avoid using these characters when sharing data between macOS and Windows: ― 〜 // ー ¢ £ ¬
- Windows does not support some characters that macOS and the TeraStation allow. If you create a filename on a Mac with any of the following characters, it will not display correctly on a Windows computer. With OS X 10.2 or later, you may have to connect to the TeraStation via AFP in order to display or copy any of the following characters:
  ? [ ] / \ = + < > ; : " , | *
- Do not use any of the following words for the name of a shared folder as these words are reserved for internal use by the TeraStation: authtest, global, homes, info, lost+found, lp, msdfs_root, mt-daapd, printers, ram, spool, usbdisk x (where "x" is a number, for example: usbdisk1)
- Don't use the following unsupported characters in shared folder names, workgroup names, or filenames:
  ①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳ Ⅰ Ⅱ Ⅲ Ⅳ Ⅴ Ⅵ Ⅶ Ⅷ Ⅸ Ⅹ

  ⅰ ⅱ ⅲ ⅳ ⅴ ⅵ ⅶ ⅷ ⅸ ⅹ ㎜㎝㎞㎎㎏㏄㎡№㏍℡㊤㊥㊦㊧㊨㈱㈲㈹㍾㍽㍼㍻ミリ キロ センチ メートル グラム トン アール ヘクタール リットル ワット カロリー ドル セント パーセント ミリバール ページ ¦ ' " ミ ミ ∮ Σ ∟ ⊿

  纊襲錵銹鼇倍炯昱棈鋹舜劉丨仡任公仔佃佖佼侻侚侔俍偉傑傛傒僩儚兗糲亘冷凧刧九劦勀勛匀匆匡卲厓厲埱婁咤咻咩喆坦垉埃埇埒塚增墝夋奓奄奮妤妹孖寀甯寘寬尞岦岑峐崧嵓崎嶂嶸嶝巔弤彋彧德恣恕悅悊惕惕愠惲愺愷惺慖戚抶揵摠搗擊教昀昕昂昉昜晒晗晥晧晙晴晢暉暠曇暲曊曺胎朗枚椑棄柀柳桄椙榯楨樺榘槢橫橆檯檄櫹櫛毖氿汜沆汯泚洄涇浯涖涪溴清滹淼淸溍澰漸濱澪濶瀨炅炫烻焄煆煇熂燁燾狄狀猰猪獷玽珉珖珣珒琇瑆琦琪琩琮瑢璉璟甁畯皐皜皞晶皦益皖砌砑硎硤硨磼礼神祥禔福禛竑竣靖錚箸精紿絜綷綠緒繒罇羨羽茁荸茂菇菶菜萴葊蕙董蕖薰蘢蛙蠣裵訒詖詹誧閶諟諸諶諰讌賴贙赶赳軏迡逸遧郎都鄉鄧釱釗釩釭釬釷釹鈆鈐鈔鈽鈀鈑鉀鉤鉑鈹鉶鉸鋗鋧鋮銖鍃銭鍬鍒鍩鍔鍚鍠鍮鎃鎈鎋鎔鏝鏟鏚鏜鏞鏤鏺鐓鐫鐺鐽鑈鑊鑌鑐鑞鑫鑼鑾钁钃镻閒隆隩隖隮霾靈靃靄靄靑靖顁顥飯飼餧館靡驎髙鬰魶鮏鮭鮭鯓鯱鵙鵫鶴鸙黑畎秈緇臂蘊訃躲鐓饎鷯

- File and folder names may contain up to 255 single-byte characters.
- Folder and workgroup names whose names contain non-Roman characters may not be displayed correctly.
- If shared folders are accessed from a Mac, information files for the Mac may be generated automatically. Do not delete these files. If they are deleted using Windows, this may prevent further access from a Mac.
- If an SMB connection is used with OS X 10.3.9, the names of mounted volumes may appear as unreadable characters in Finder and other applications. This is not a problem with the filename or data.
- With OS X 10.5 to 10.5.6, Spotlight searches are not supported over AFP connections. Use SMB connections or upgrade to OS X 10.5.7 or later.
- The TeraStation belongs to the default zone in AppleShare; the zone cannot be specified.
- When files are copied to the TeraStation or to a USB drive connected to the TeraStation, file information such as date created, date modified, and other date information may be updated or changed.
- During a file transfer, if settings are changed, the file transfer operation may be aborted.
- File copying to the TeraStation is protected by a journaling file system. If the Ethernet cable is disconnected or a power outage occurs while copying data, the following may occur:
  - Preset data such as the TeraStation name, users, and groups may be erased.

- An incomplete file may be copied and the file can no longer be deleted. If this happens, restart the TeraStation, delete the file, and perform the copy operation again.

Recycle Bin

To protect your data from accidental deletion, you may configure your TeraStation to use a recycle bin instead of deleting files immediately. The recycle bin will only work with SMB connections. To empty the recycle bin, click *File Sharing - Folder Setup - Empty Recycle Bin* in Settings.

Notes:

- You can prevent guests and other users from emptying the trash by navigating to *File Sharing - SMB - Recycle Bin Permissions* and select "Administrator only".
- If you use macOS, select "Exclude Mac OS temp files from recycle bin" option. If this setting is changed, files in the recycle bin may be corrupted.

Read-Only Shares

By default, new shares are set with read and write access, but you may change the attribute to *Read Only* in *Attribute*. Read-only shares and HFS Plus-formatted USB drives will have "(Read Only)" added to comments in Explorer.

Note: Configure read-only file attribute in Settings. Configuring them from within Windows is not supported and may cause unexpected behavior.

Hidden Shares

If hidden shares are enabled, shared SMB folders will not be displayed in Network, and only certain users are allowed to access them. To hide a shared SMB folder, follow the procedure below.

1 In Settings, navigate to *File Sharing - Folder Setup* and choose a shared folder or a USB drive to configure hidden shares.

2 Select the "Hidden Share (SMB Only)" checkbox and click *OK*.

Notes:

- If protocols other than "SMB" or "Backup" under "LAN Protocol Support" are enabled, the hidden shares option will be grayed out and cannot be selected.
- Configure hidden share attribute in Settings. Configuring them from within Windows is not supported and may cause unexpected behavior.

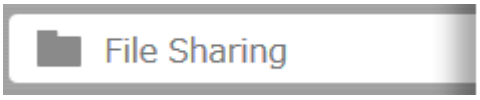
To access a hidden folder, open File Explorer in your computer and enter "\\TeraStation name\Shared folder name$\" for the name. For example, if the TeraStation name is "TSXXX001" and the shared folder name is "share", enter "\\TSXXX001\share$\" to open it.

Configuring Users

Adding a User

Note: The TeraStation can register a maximum 300 of users, which includes the default users "admin" and "guest".

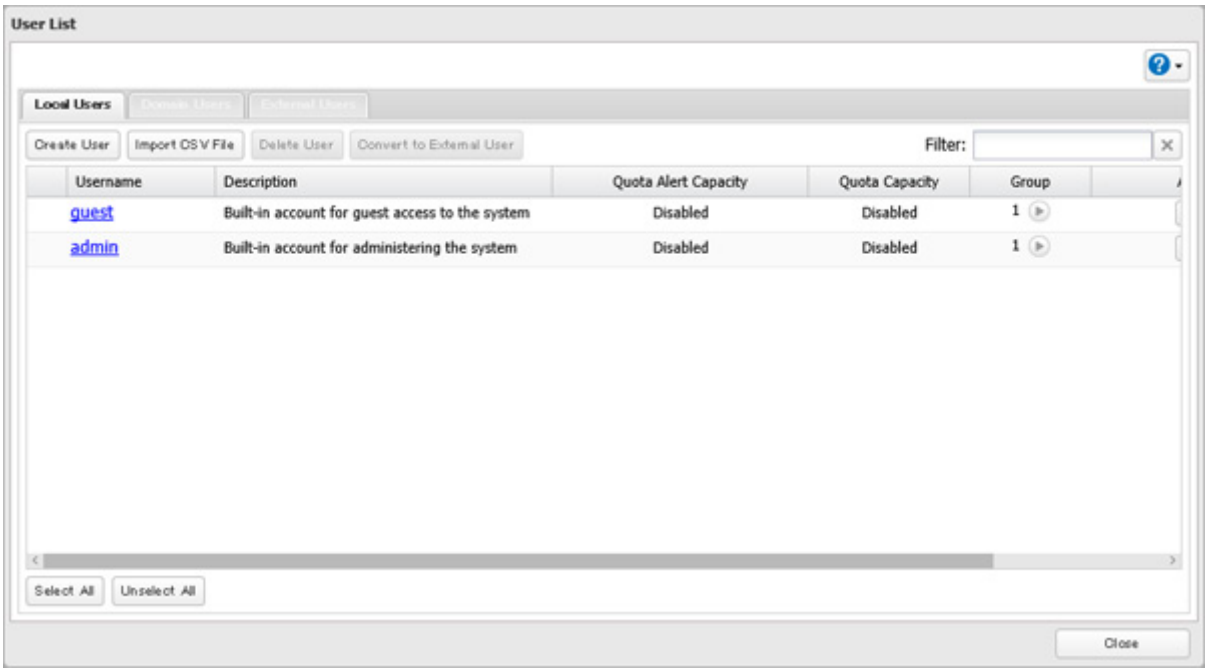
1 In Settings, click *File Sharing*.



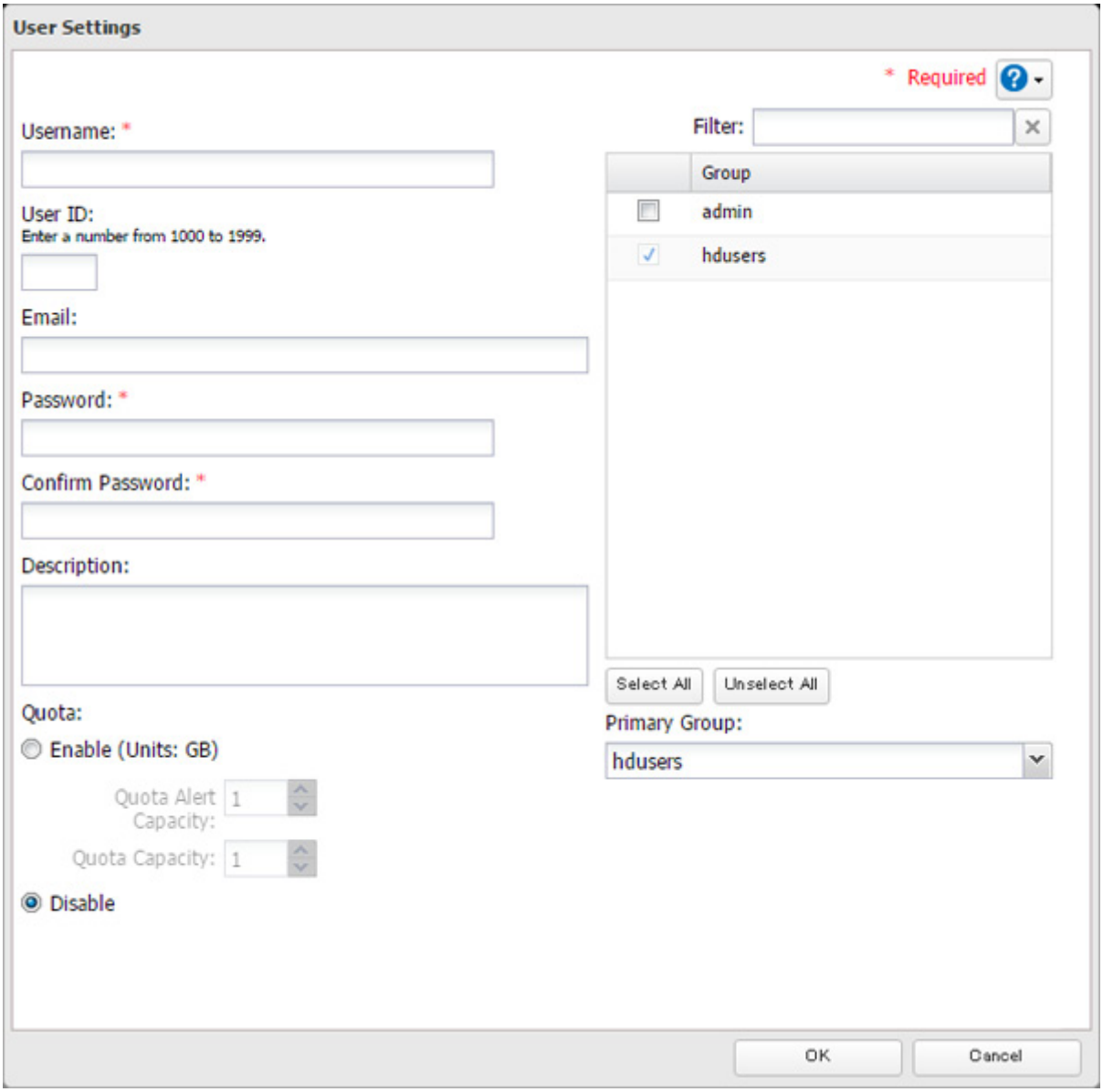
2 Click  to the right of "Users".



3 Click *Create User*.



4 Enter the desired settings, then click *OK*.



Notes:

- Usernames may contain up to 128 alphanumeric characters, hyphens (-), underscores (_), periods (.), and symbols !, #, &, @, $, *, ^, %. The first character should not be a symbol.
- The user ID should be a number from 1000 to 1999. Each user ID should be unique. If this field is left blank, a user ID is assigned automatically.
- Do not duplicate user IDs, group IDs, usernames, or group names. Each should be distinct and unique.
- User descriptions may contain up to 75 alphanumeric characters, hyphens (-), underscores (_), and spaces. The first character should not be a symbol or space.
- Passwords may contain up to 20 alphanumeric characters and the following characters: - _ @ ! # $ % & ' ( ) * + , . / ; < > = ? " [ ] ^ { } | ~. The first character should not be a symbol other than an underscore (_).
- Use the same username and password for both Windows and the TeraStation or you may not be able to access shared folders.
- Do not use any of the following words for a username as these words are reserved for internal use by the TeraStation: adm, admin, administrator, all, apache, bin, daemon, disk, ftp, ftpuser, guest, halt, hdusers, kmem, lp, mail, man, mysql, news, nobody, nogroup, none, operator, root, shadow, shutdown, sshd, sync, sys, tty, users, utmp, uucp, www

Importing User Information

You can import users in *File Sharing - Users* by clicking *Import CSV File*.
Format for user data: Username (required), password (required), and user description (optional).
Example 1: Importing usernames, passwords, and comments
username1,password1,comment1
username2,password2,comment2
username3,password3,comment3

Example 2: Importing usernames and passwords
username1,password1,
username2,password2,
username3,password3,

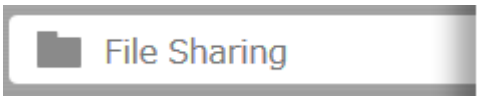
Guidelines:

- Use commas (,) as separators. Do not put spaces before or after commas. If you don't want user descriptions, use a comma after password at the end.
- If a line has an incorrect format, the user on that line will not be registered.
- If a username already exists, the new user information will overwrite the old information.
- Do not use commas (,) in the username, password, or user description.

Note: Imported users are added to the "hdusers" group automatically.

Adding a Group

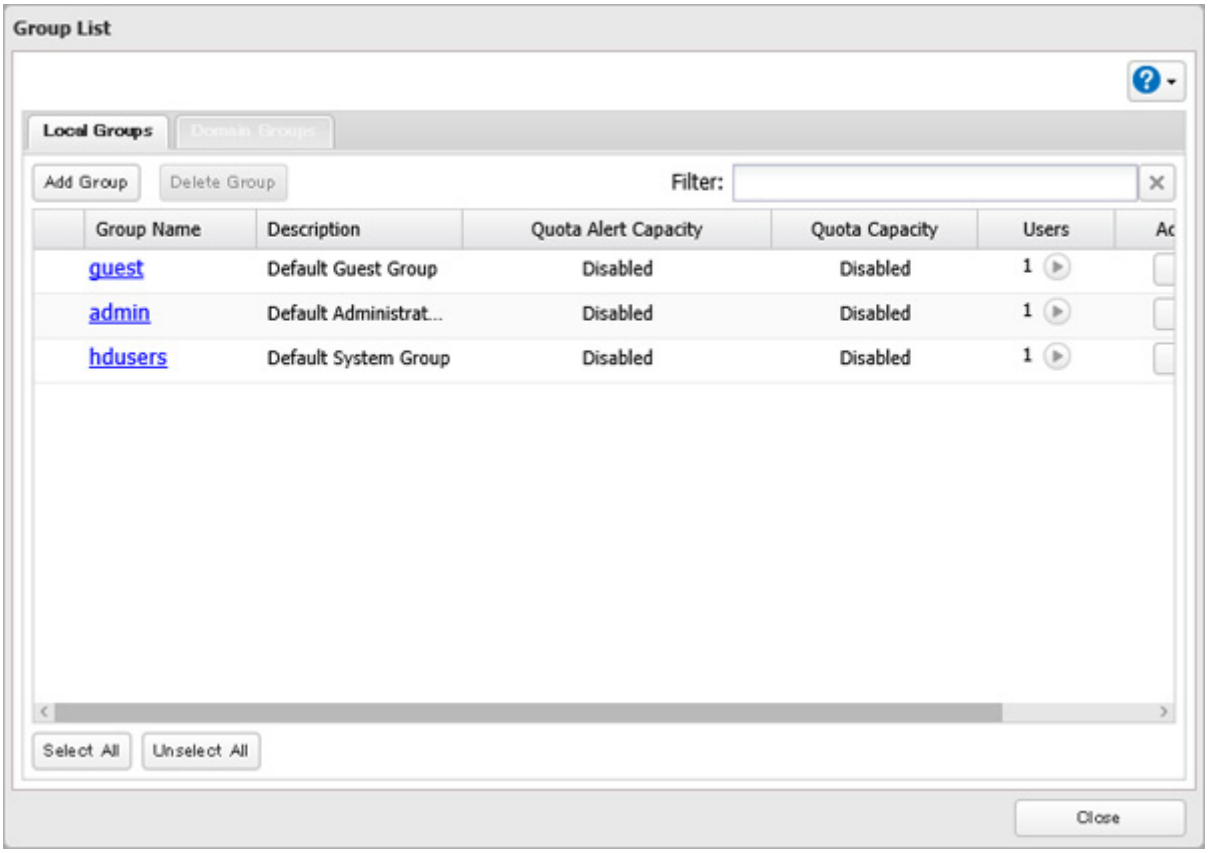
1 In Settings, click *File Sharing*.



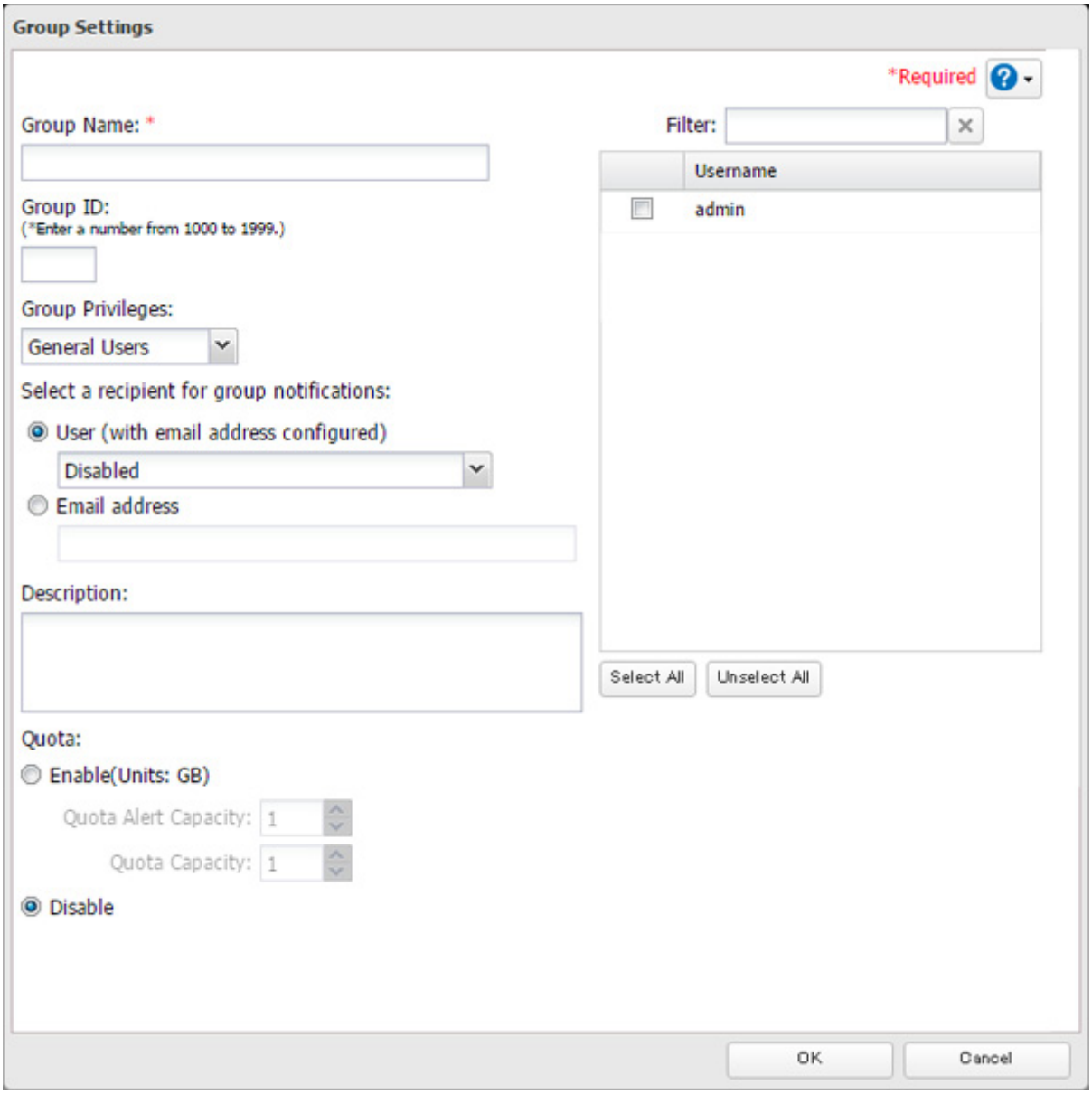
2 Click  to the right of "Groups".



3 Click *Add Group*.



4 Enter the desired settings, then click *OK*.



Notes:

- Group names may contain up to 20 alphanumeric characters, hyphens (-), underscores (_), and periods (.). The first character should not be a symbol other than an underscore (_).
- Group descriptions may contain up to 75 alphanumeric characters, hyphens (-), underscores (_), and spaces. The first character should not be a symbol or space.
- If the group ID field is left blank, a group ID is automatically assigned. Use numbers between 1000 and 1999 to set a group ID manually. Don't use duplicate group IDs.
- You may register up to 300 groups with the TeraStation.
- If you are logged in as a member of the general users group, you can only change your own password. If you're logged in as an administrator, you can change any settings, including other users' passwords. If you are logged in as a member of the power users group, you can create and edit shared folders, users, and groups.
- Do not use any of the following words for a group name as these words are reserved for internal use by the TeraStation: adm, admin, administrator, all, apache, bin, daemon, disk, ftp, ftpuser, guest, halt, hdusers, kmem, lp, mail, man, mysql, news, nobody, nogroup, none, operator, root, shadow, shutdown, sshd, sync, sys, tty, users, utmp, uucp, www

Configuring Access Restrictions

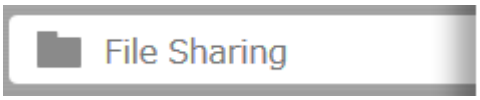
You may restrict access to specific shared folders, including external USB drives.

Notes:

- Access restrictions can be set separately for each shared folder, but not for folders within the shared folders.
- Configure access restrictions through Settings. Configuring access restrictions through Windows is not supported and may cause unexpected behavior.
- You can also configure users, groups, and shared folders from Easy Admin by clicking *Access Restrictions*.
- Shared folders with limited access can still be used as backup destinations.
- If you change access restrictions for a user or group while they are accessing files, unexpected behavior may result.

Local Users and Groups

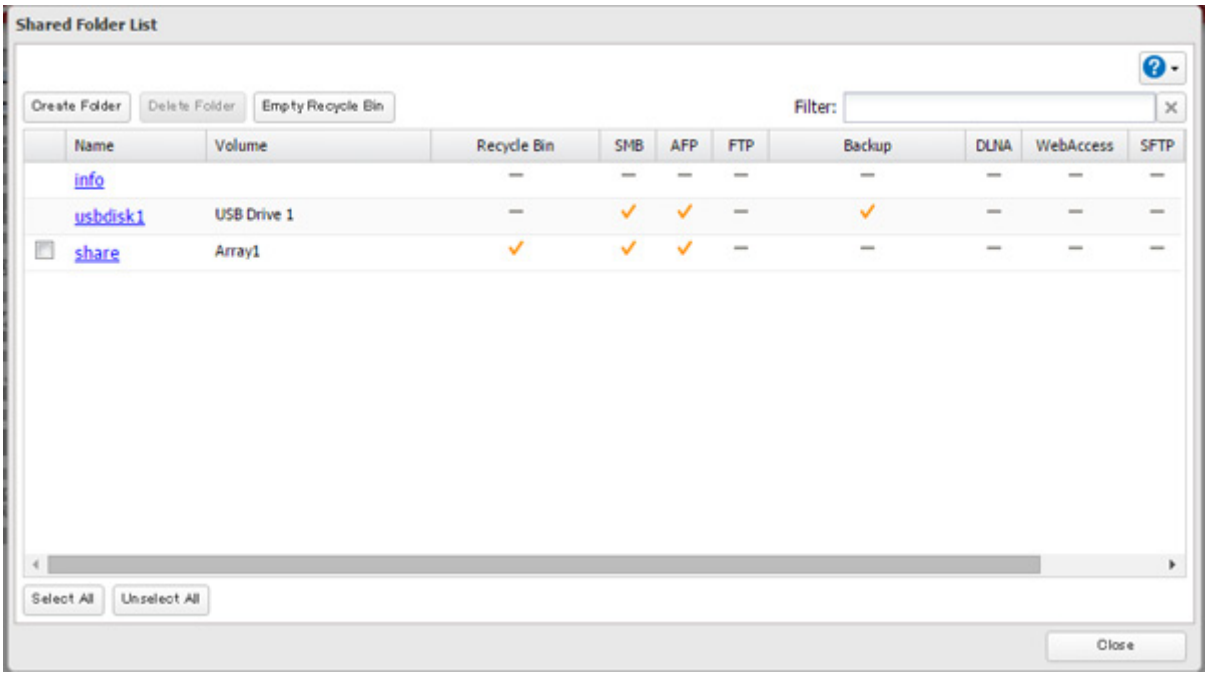
1 In Settings, click *File Sharing*.



2 Click  to the right of "Folder Setup".



3 Click the shared folder that you want to set access restrictions for.



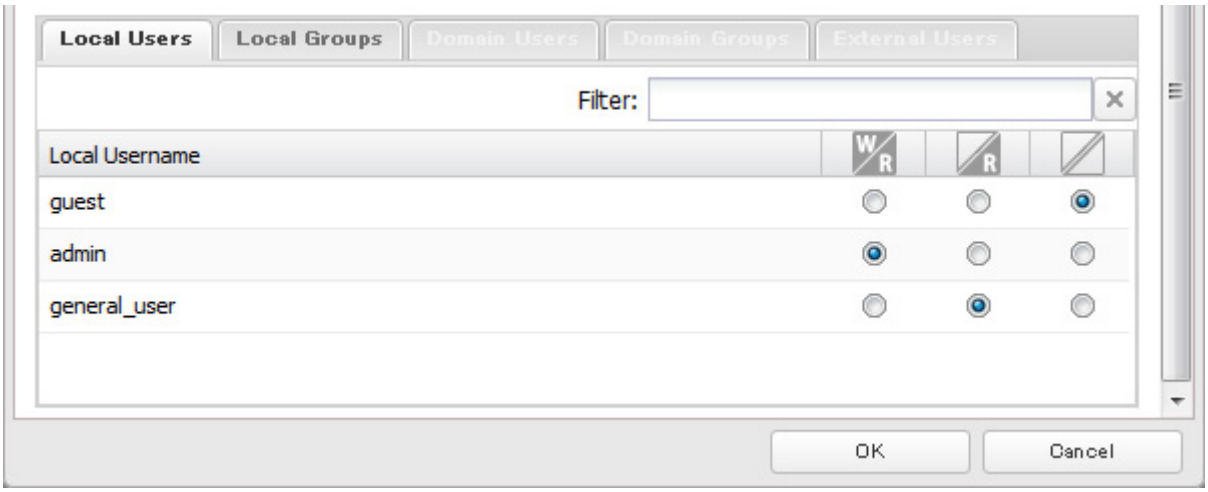
4 Click *Edit*.

5 Enable "Access Restrictions".



6 Select the level of access for the user or group you added.

: Read and write access allowed : Read access allowed : Access prohibited



7 Click *OK*.

Notes:

- The example above shows access restriction by user. To restrict access by group, click the *Local Groups* tab and select group permissions.
- If both read-only and read and write permissions are given to a user, the user will have read-only access. The most restrictive access always applies.
- For an access-restricted shared folder, if you change the access restrictions of all users and groups from read and write or read only to access prohibited from the user or group list page in Settings, that shared folder can only be accessed by admin users and groups.

Active Directory

If there is an Active Directory environment, the TeraStation will use account information from the Active Directory domain controller to set access restrictions for TeraStation's shared folders. There is no need to perform individual account management for the TeraStation. If multiple TeraStations are installed on the network, the account information is centrally managed in Active Directory, greatly reducing the operations required for installation and management.

Notes:

- If usernames or group names from Active Directory include multibyte characters, you will not be able to configure access restrictions for them.
- The TeraStation supports a domain environment with a maximum of 1000 users and 1000 groups.

1 In Settings, click *Network*.

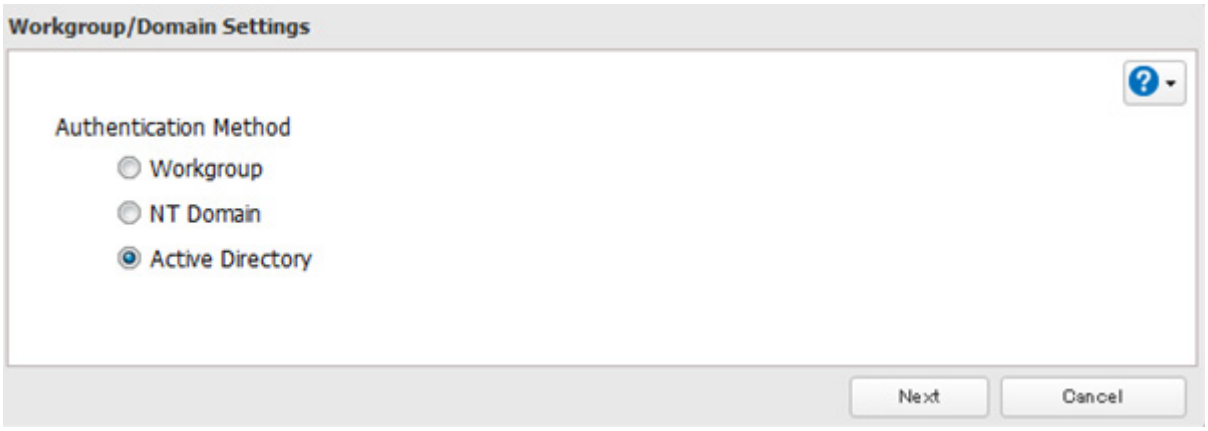


2 Click  to the right of "Workgroup/Domain".



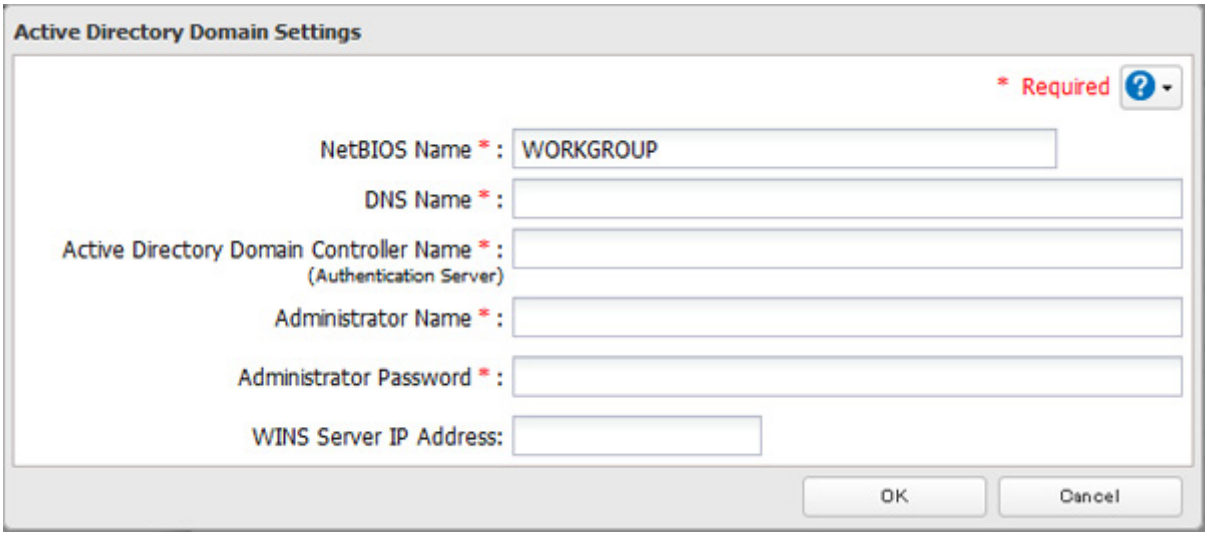
3 Click *Edit*.

4 Select "Active Directory", then click *Next*.



5 Click *Yes*.

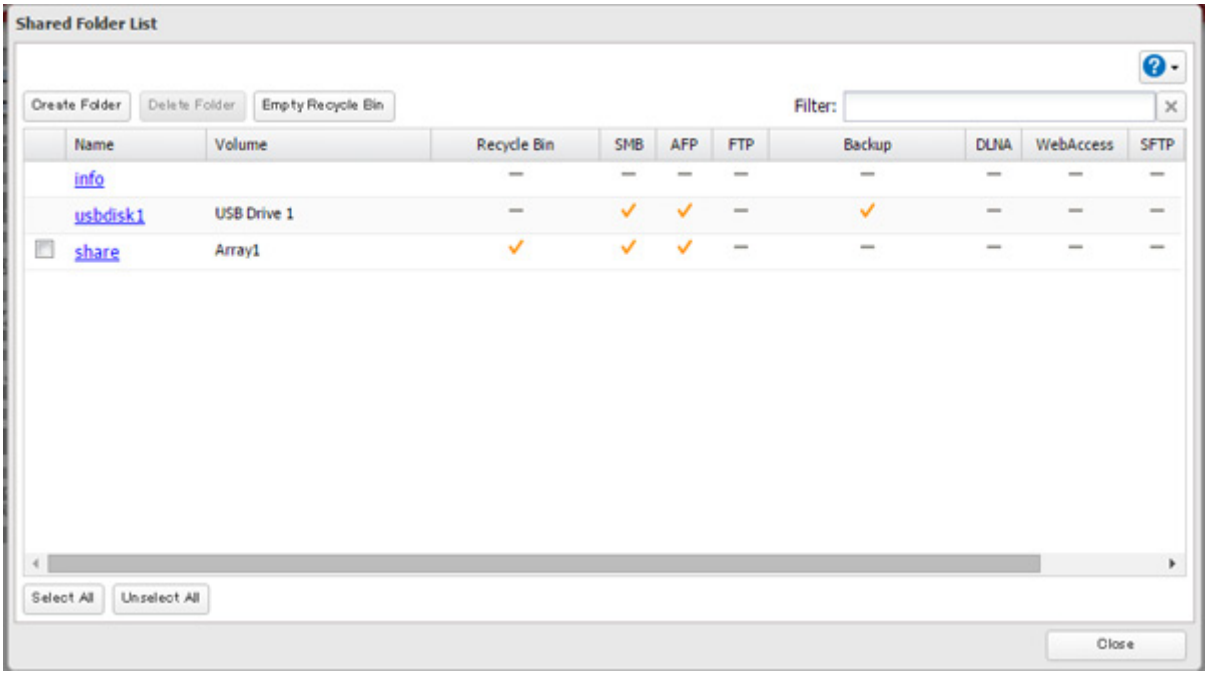
6 Enter the desired settings, then click *OK*.



7 Click  to the right of "Folder Setup".



8 Click a shared folder that you want to set access restrictions for.



9 Click *Edit*.

10 Enable "Access Restrictions".



11 Select the level of access for the user or group.

: Read and write access allowed : Read access allowed : Access prohibited

12 Click *OK*.

Notes:

- To have the TeraStation join an Active Directory domain, configure it to use a DNS server that can resolve names for the Active Directory domain.
- After building an Active Directory domain, the administrator password for joining the domain must be changed at least once, or joining the Active Directory domain will fail.
- The DNS name and NetBIOS name of Active Directory domains should be identical.
- If both read-only and read and write permissions are given, the user will have read-only access. The most restrictive access setting will apply.
- If there is a difference of more than 5 minutes between the TeraStation's clock and the domain controller's clock, joining the domain or authenticating domain users and groups may fail. For best results, use an NTP server to set the time for all network devices.
- To use the TeraStation as a member server in an Active Directory domain, the TeraStation should be logged in to the domain and accessed from a computer that is not a member of the domain with a valid domain account.
- If the TeraStation is a member server of an Active Directory domain, you cannot connect as a guest user via AFP.
- If your TeraStation is a member server in an Active Directory domain and you change the authentication method to "Workgroup", the account on the domain controller will not be deleted automatically.
- If FTP is enabled, local and domain group access restrictions from the AD network do not work. Use user access restrictions instead.

- For an access-restricted shared folder, if you change the access restrictions of all users and groups from read and write or read only to access prohibited from the user or group list page in Settings, that shared folder can only be accessed by admin users and groups.

NT Domain

In an NT domain environment, the TeraStation uses account information from the NT domain server to set access restrictions for files and folders on the TeraStation. There's no need to perform individual account management for the TeraStation. If multiple TeraStations are installed on the network, the account information is centrally managed in the NT domain, greatly reducing the operations required for installation and management.

Note: The TeraStation supports a NT domain environment with a maximum of 1000 users and 1000 groups.

1 Create an account on the domain controller for the TeraStation.

2 In Settings, click *Network*.



3 Click  to the right of "Workgroup/Domain".



4 Click *Edit*.

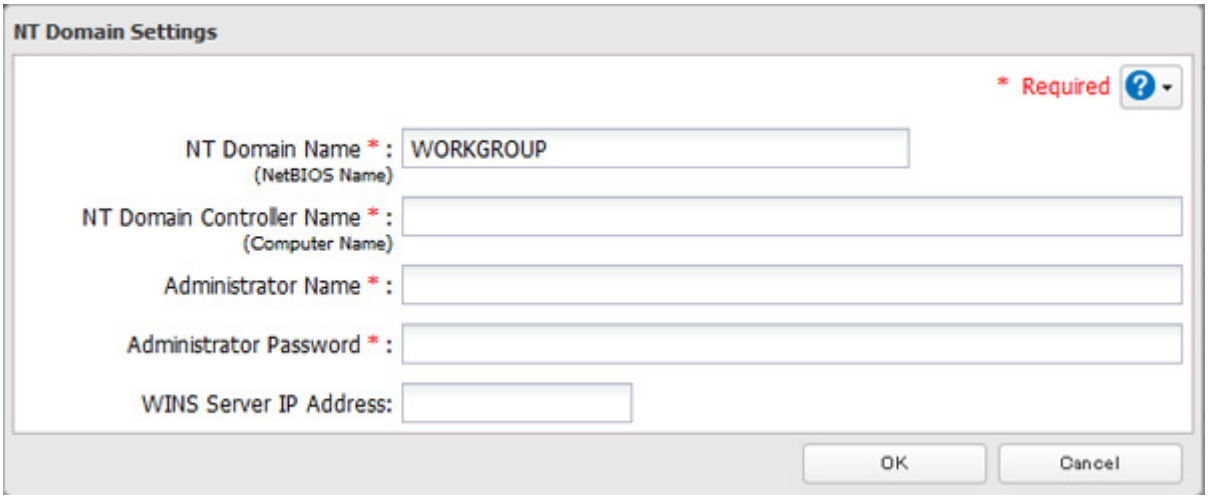
5 Select "NT Domain", then click *Next*.



Note: To use Active Directory from Windows 2000 or Windows Server 2003, select "Active Directory" instead of "NT Domain".

6 Click *Yes*.

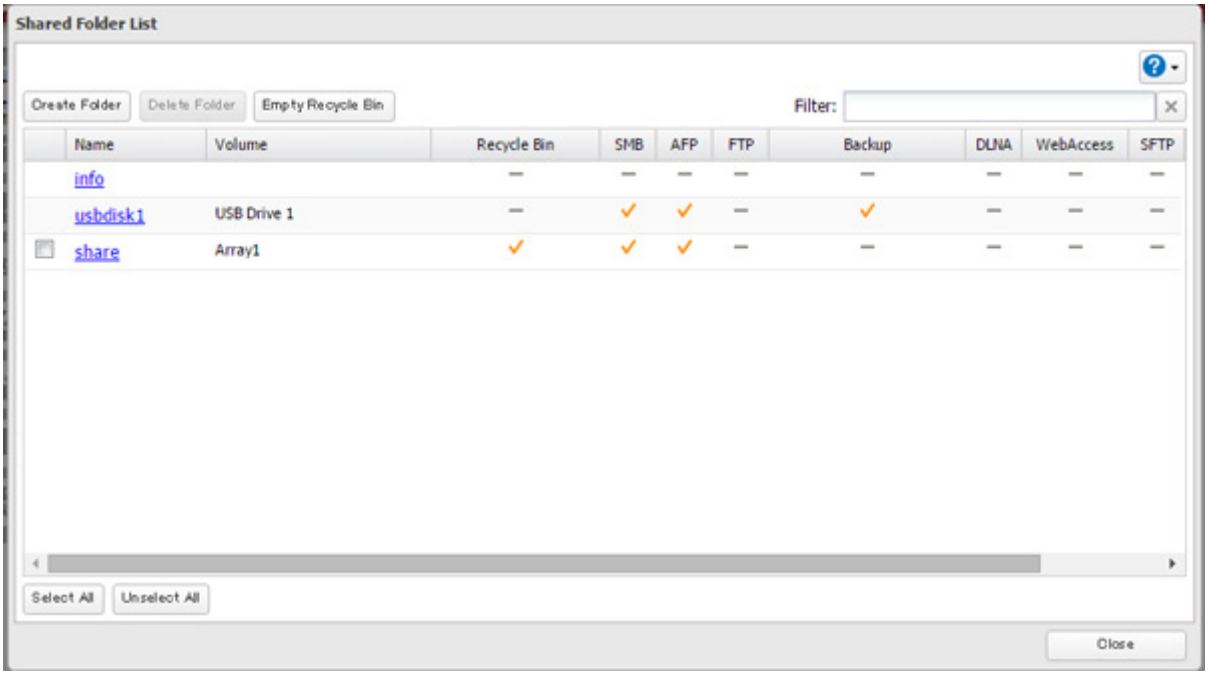
7 Enter settings and click *OK*.



8 Click  to the right of "Folder Setup".



9 Click a shared folder for which you want to set access restrictions.



10 Click *Edit*.

11 Enable "Access Restrictions".



12 Select the level of access for the domain user or group.

: Read and write access allowed : Read access allowed : Access prohibited

13 Click *OK*.

Notes:

- If you change the TeraStation's name, you will no longer be able to use domain users and groups or access restrictions. To repair this, rejoin the domain.
- If both read-only and read and write permissions are given to a user, the user will have read-only access.
- If a domain username is more than 20 bytes long, the TeraStation truncates it to 20 bytes.
- To use the TeraStation as a member server in an NT domain, the TeraStation should be logged in to the domain and accessed from a computer that is not a member of the domain with a valid domain account.
- If the TeraStation is a member server of an NT domain, you cannot connect as a guest user via AFP.
- When you change the user or group settings on the domain controller, these changes may not take effect immediately on the TeraStation until it is rebooted.
- If your TeraStation is a member server in an NT domain and you change the authentication method to "Workgroup", the account on the domain controller will not be deleted automatically.
- If FTP is enabled, local and domain group access restrictions from the NT domain network do not work. Use user access restrictions instead.
- For an access-restricted shared folder, if you change the access restrictions of all users and groups from read and write or read only to access prohibited from the user or group list page in Settings, that shared folder can only be accessed by admin users and groups.

User Authentication with an External SMB Server

TeraStations on your network can be linked to an external authentication server for centralized management of user accounts and passwords. The authentication server should be another TeraStation or a LinkStation. Other external SMB authentication servers are not supported.

Notes:

- Disable SMB2 before using external authentication.
- Access restrictions for local users and groups will still apply to shared folders if an external SMB server is used for authentication.
- The procedure below contains methods to automatically register external users. You can also manually add external users by converting them from local users. Refer to the "Converting Local Users into External Users" section below for more details on converting local users.

1 In Settings, click *Network*.



2 Click  to the right of "Workgroup/Domain".



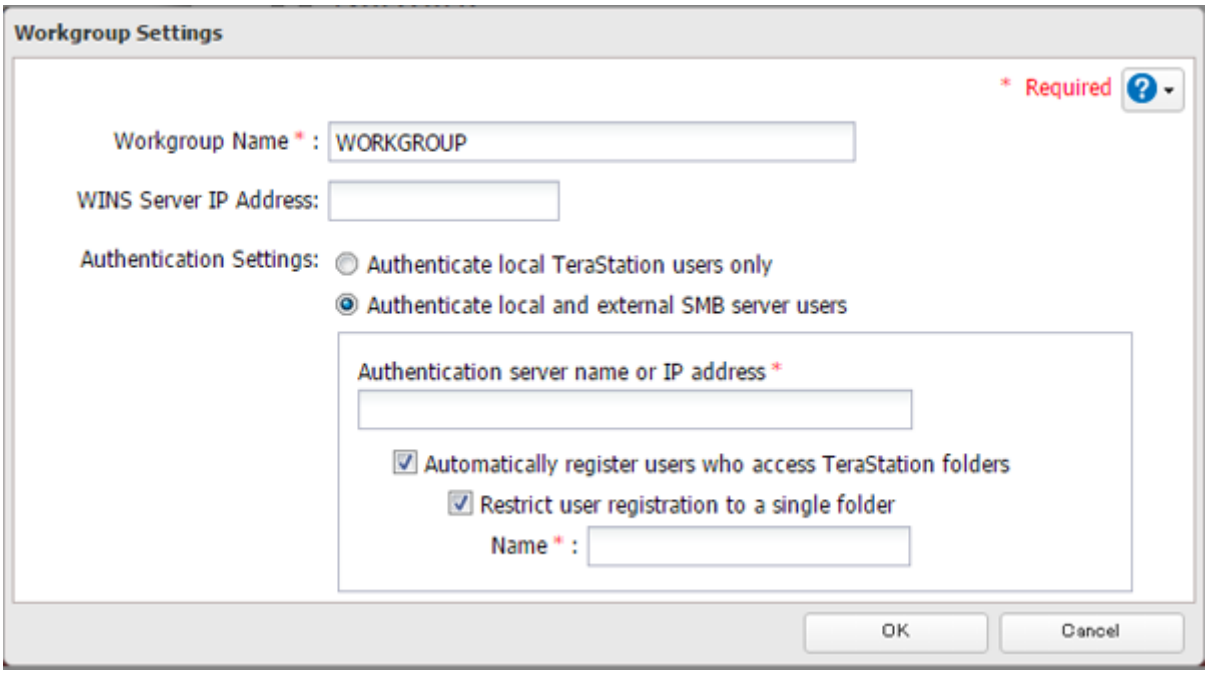
3 Click *Edit*.

4 Select "Workgroup" and click *Next*.



5 If a prompt appears, click *Yes*.

6 Enter a workgroup name. Select "Authenticate local and external SMB server users" and enter the SMB server's IP address. You can also specify a server from another subnet.



7 If "Automatically register users who access TeraStation folders" is checked, users that access any of the TeraStation's folders will be automatically registered as external users. This process only applies with folders that have access restrictions disabled. After new external users are added, disable this option to limit the number of authenticated user accounts.

8 If "Restrict user registration to a single folder" is checked, the TeraStation will automatically create a read-only shared folder. Enter the shared folder name. Users that access this specific folder will be automatically registered as external users. If this setting is deselected at a later time, the TeraStation will automatically remove the folder.

Note: Connect to the authentication folder via SMB, not FTP or AFP. Automatic user registration may not work with OS X 10.8 (or later) the first time. If this occurs, try rebooting the TeraStation then access the authentication shared folder again.

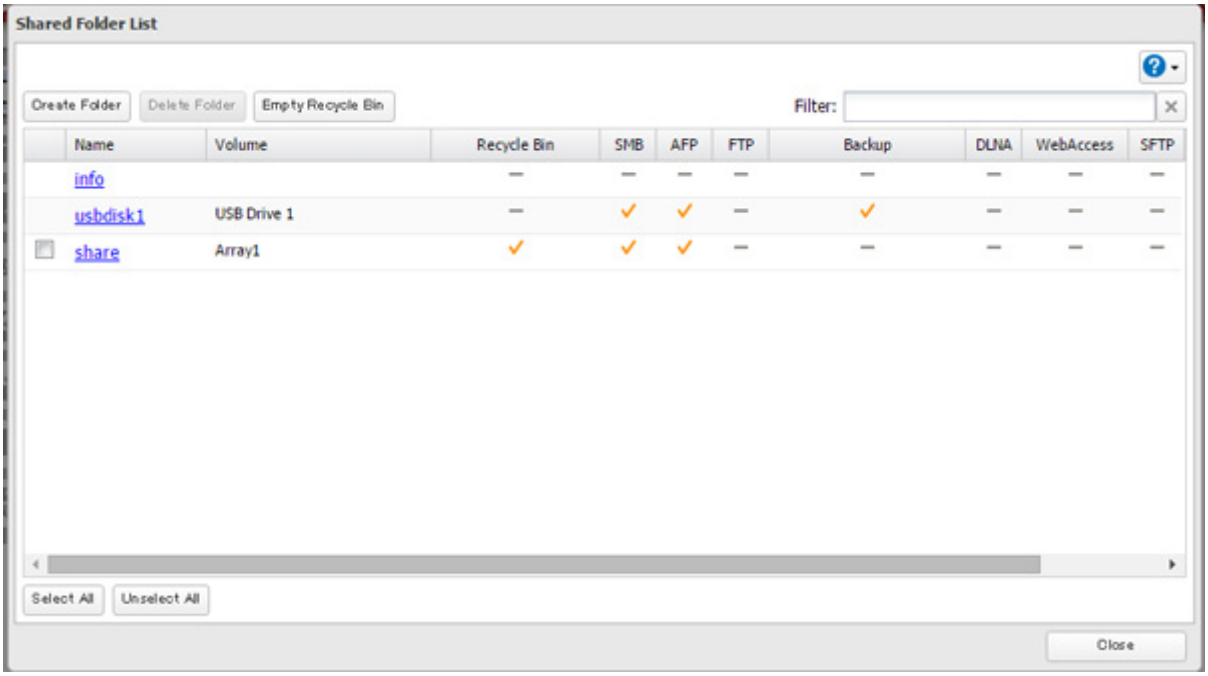
9 Click *OK* to save any changes. When saving changes to the external authentication server settings, you may not to convert all current local users to external users. If a local user is converted to an external user, their user

information (including passwords) will be removed from the NAS. External users cannot be reverted to local users.

10 Click  to the right of "Folder Setup".



11 Click a shared folder to set access restrictions on.



12 Click *Edit*.

13 Enable "Access Restrictions".



14 Click on the *External Users* tab and select the level of access for each external user.

: Read and write access allowed : Read access allowed : Access prohibited

15 Click *OK*.

Notes:

- Users that are automatically registered belong to the "hdusers" group. They can be added to other groups from within group settings. Added users will be listed in "Users" - "External Users". To delete a user that was registered automatically, select that user and click *Delete External User*.
- If both read-only and read and write permissions are given to a user, the user will have read-only access.
- OS X 10.4 or earlier and Windows Server 2012 are not supported with external authentication.
- To access access-limited shared folders from OS X 10.7, use AFP instead of SMB; under "LAN Protocol Support", check "AFP (Mac)" on the destination folders to use AFP and click *OK*.
- If access restrictions are set for users and groups from the authentication server, guest and anonymous connections will not be possible with AFP connections.
- FTP connections do not support authentication with an external SMB server.

- If using a Windows PC for external authentication, the default Windows SMB security settings may need to be changed. An easy way to do this is to run the File Sharing Security Level Change Tool, available from this product's download page on the Buffalo website. This utility will let you easily change or restore your Windows security settings to work with external authentication.
- If you change all users' and groups' access attributes for the access-restricted shared folder, from read and write or read only to access prohibited in the user or group list page of Settings, that shared folder can only be accessed by admin users and groups.

Converting Local Users into External Users

If using an external SMB server for authentication, you may convert any local users into external users. This way, the TeraStation will have a user list that matches the users in the external SMB server, and access restrictions for this TeraStation's shared folders may be assigned to the converted "external" users.

Follow the procedure below to convert a local user into an external user. If a local user is converted, their user information (including passwords) will be removed from the TeraStation. External users cannot be reverted to local users.

Note: External authentication should be enabled before local users can be converted. For more information on external authentication, refer to the "User Authentication with an External SMB Server" section.

1 In Settings, click *File Sharing*.

2 Click  to the right of "Users".

3 In the user list screen, check any users to be converted to an external user, then click *Convert to External User*.

4 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

Converted users are displayed under the "External Users" tab. You can then configure access restrictions for external users.

Chapter 4 Managing Storage

RAID Modes

TeraStations support many types of RAID. The type of RAID arrays available for use depends on how many drives are installed in your TeraStation.

Notes:

- If you change the RAID mode, all data on the array is deleted. This is true for every procedure in this chapter. Always back up any important data before performing actions that affect your RAID array.
- Hard drive capacity is shown in Settings in actual gigabytes. The Properties window in Windows may show GiB instead, which will be a smaller number.
- After the RAID mode is changed (except when creating a RAID 0 array or JBOD), the TeraStation performs a RAID check that will take about 10 hours per TB. File transfers are slower during this period. While the I17 message is displayed on the LCD panel, do not turn off the TeraStation. If you do, the RAID check starts over.
- If the TeraStation is restarted or shut down while changing the RAID mode, the message displayed on the LCD panel will change from I46 or I47 to I18.
- RAID 61 and 60 are only available for 8-drive models; RAID 51 and 50 are available for 8 and 6-drive models; RAID 5, 6, and 10 are available for 8, 6, and 4-drive models.

RAID 6

RAID 6 arrays are available for TeraStations with 4 or more hard drives. RAID 6 combines 4 or more drives into a single array. The usable space is equal to the sum of the capacity of all drives minus the capacity of two drives. For example, if 4 drives are combined into a RAID 6 array, the usable space is the sum of the capacity of 2 drives. If 2 drives in the array are damaged, you can recover data by replacing them. If 3 or more drives are damaged, your data is lost.

RAID 61

RAID 61 arrays are available for TeraStations with 8 or more drives. In this mode, two RAID 6 arrays are mirrored in a RAID 1 array. 8 drives in a RAID 61 array have a usable capacity of 2 x the capacity of the smallest drive.

RAID 60

RAID 60 arrays are available for TeraStations with 8 or more drives. In this mode, two RAID 6 arrays are combined in a RAID 0 array. 8 drives in a RAID 60 array will have a usable capacity of 4 x the capacity of the smallest drive.

RAID 5

RAID 5 arrays are available for TeraStations with 3 or more hard drives. RAID 5 combines 3 or more drives into a single array. The usable space is equal to the sum of the capacity of the hard drives minus the capacity of one drive. For example, if 4 drives are combined into a RAID 5 array, the usable space is the sum of 3 drives. If one drive in the array is damaged, you can recover data by replacing the damaged drive. If two or more drives are damaged at the same time, your data is lost.

RAID 51

RAID 51 arrays are available for TeraStations with 6 or more hard drives. In this mode, two RAID 5 arrays are combined into a RAID 1 array. The total usable space for 6 drives in a RAID 51 array is 2 x the capacity of the smallest drive. For 8 drives, the total usable capacity is 3 x the capacity of the smallest drive.

RAID 50

RAID 50 arrays are available for TeraStations with 6 or more hard drives. In this mode, two RAID 5 arrays are combined into a RAID 0 array. The total usable space for 6 drives in a RAID 50 array is equal to 4 x the capacity of the smallest drive. For 8 drives, the total usable space is equal to 6 x the capacity of the smallest drive.

RAID 10

RAID 10 arrays are available for TeraStations with 4 or more hard drives. In this mode, mirrored pairs of drives in RAID 1 arrays are combined into a RAID 0 array. The usable space is equal to the capacity of the smallest drive multiplied by the number of hard drives divided by 2.

RAID 1

Combines 2 or more drives into a mirrored array. The available space in the array is the capacity of a single drive. Identical data is written to each drive. If a drive is damaged, data can be recovered by replacing the damaged drive. As long as one drive in the array remains undamaged, all data in the array can be recovered.

RAID 0

Combines 2 or more drives into a single array. The usable drive space is the total space of all drives used. This simple RAID mode offers faster performance than RAID modes that include parity. If a single drive in the array fails, then all data in the array is lost.

JBOD

This mode uses the hard drives inside the TeraStation as individual drives. The drive space you can use is the total capacity of all drives in the TeraStation. If any drive is damaged, then the data on that drive is lost.

Working with RAID Arrays

To change RAID settings, navigate to *Drives* - *RAID* in Settings.

Using JBOD

With JBOD, each hard drive in the TeraStation is addressed separately. To put drives from an array into JBOD, follow the procedure below.

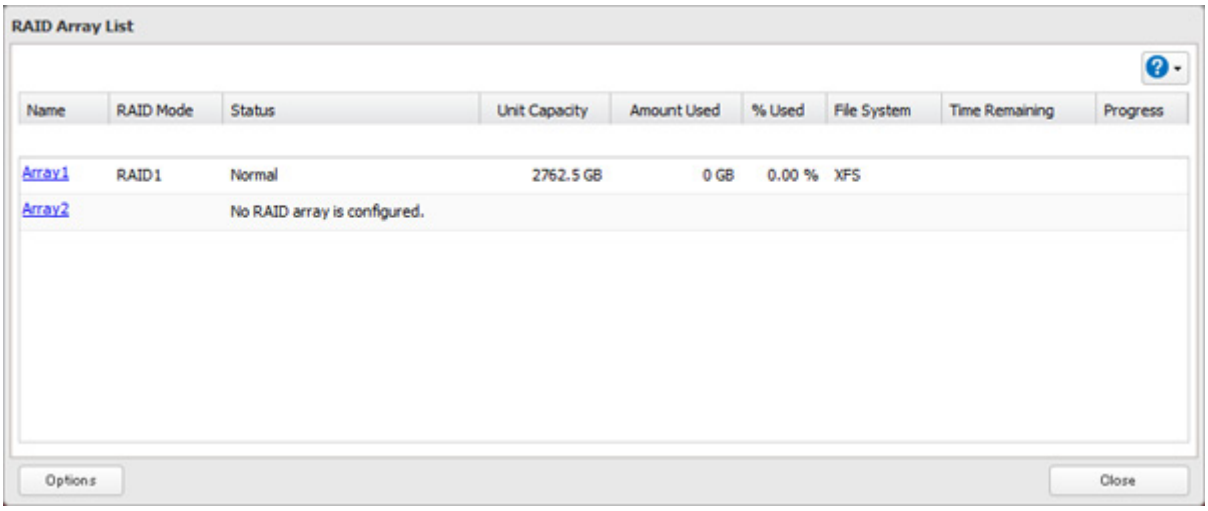
1 In Settings, click *Drives*.



2 Click  to the right of "RAID".



3 Click the array to delete.



4 Click *Delete RAID Array*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

6 Click *OK* when finished.

Once JBOD is configured, create shared folders on each drive to use them.

Changing RAID Mode

To change the RAID mode, first put the drives in JBOD.

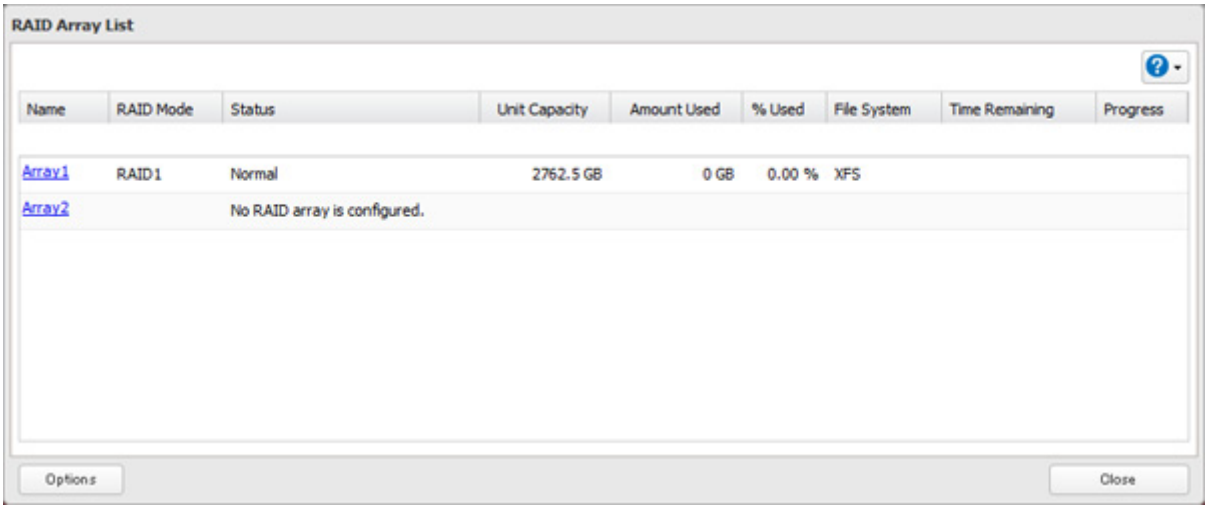
1 In Settings, click *Drives*.



2 Click  to the right of "RAID".



3 Click the array to delete.



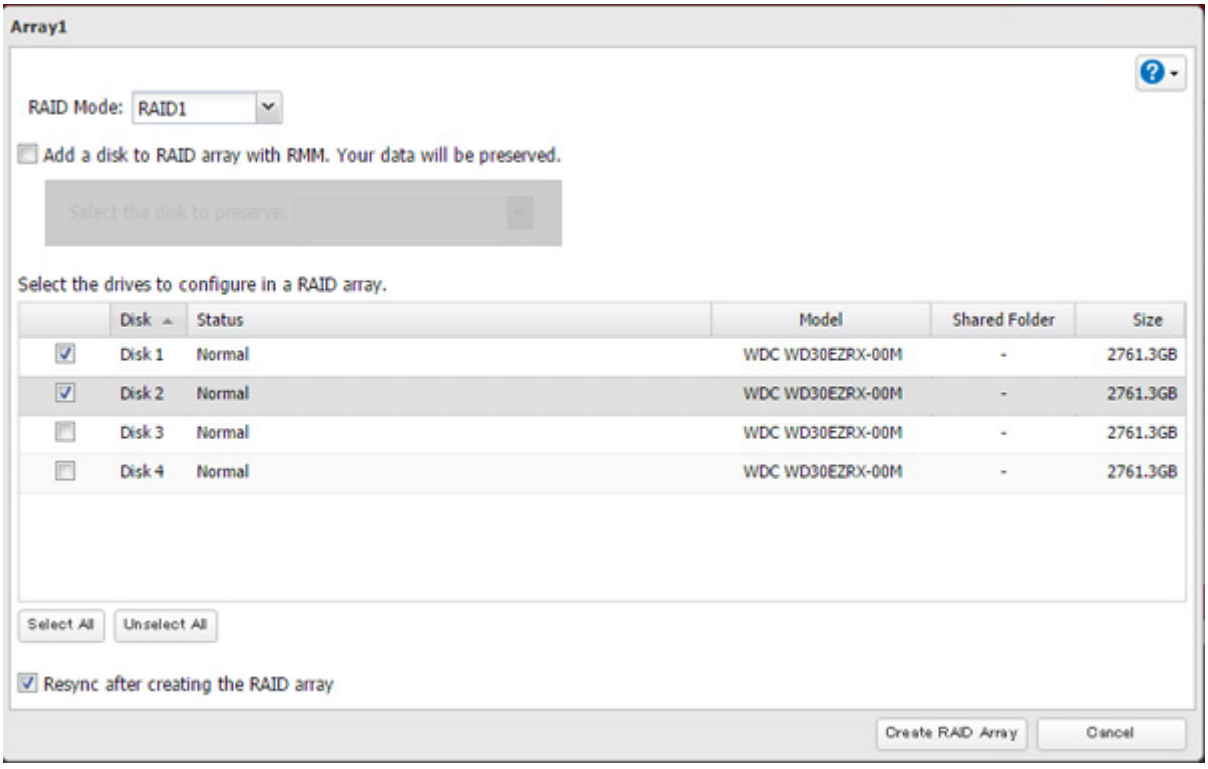
4 Click *Delete RAID Array*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

6 Click *OK*.

7 Choose a RAID array.

8 Select a RAID mode and the drives to be used, then click *Create RAID Array*.



Note: Normally, after a RAID array is created, it is "resynced", which optimizes the array, making it more stable. The resyncing process takes about 1 hour per terabyte of space in the array. File transfers will be slower during this period, but the array will remain fully usable. The I17 message will be shown on the LCD display during the resync. If you uncheck "Resync after creating the RAID array", the resync will be skipped. This is not recommended for RAID 5 arrays, which should always be resynced. Resyncing is not needed for RAID 0 arrays. If the TeraStation is rebooted during the resyncing process, the resync will begin again from the beginning.

9 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

10 Click *OK* when finished.

Notes:

- You can also configure RAID settings from Easy Admin.
- After changing the RAID mode, create a shared folder.

Configuring a Hot Spare

If you have a hot spare configured and an array fails, the TeraStation immediately switches over to the hot spare. To use a hot spare, you need an extra drive that's not part of any array and a RAID 1, RAID 10, RAID 5, RAID 51, or RAID 6 array.

Notes:

- All data on the hot spare drive is deleted when it is configured as a hot spare and again when it changes from a spare to a drive in the array.
- A hot spare cannot be configured for TeraStation models with only two hard drives. Use RAID 1 instead.

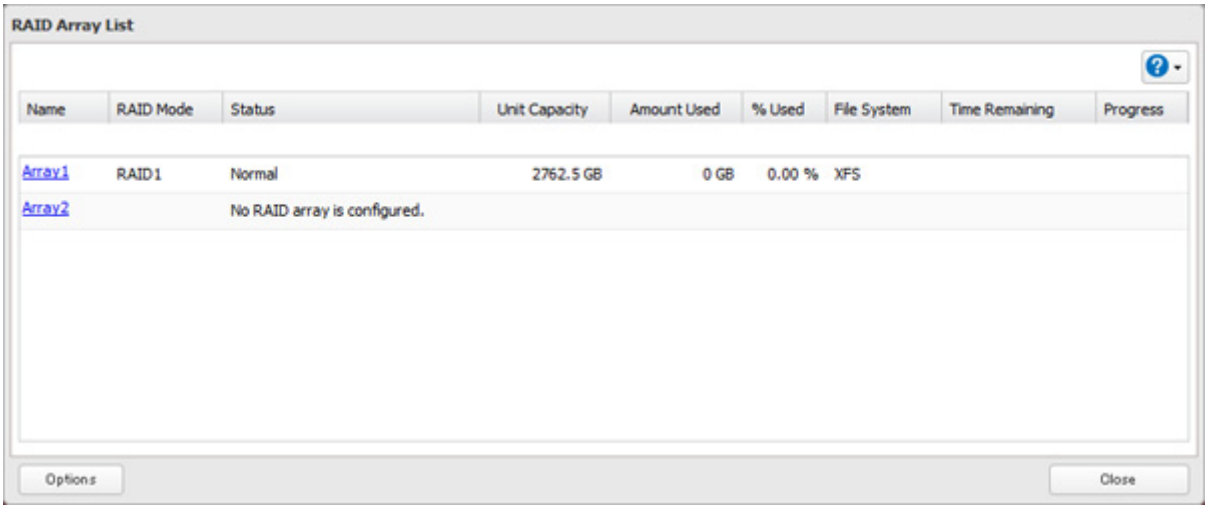
1 In Settings, click *Drives*.



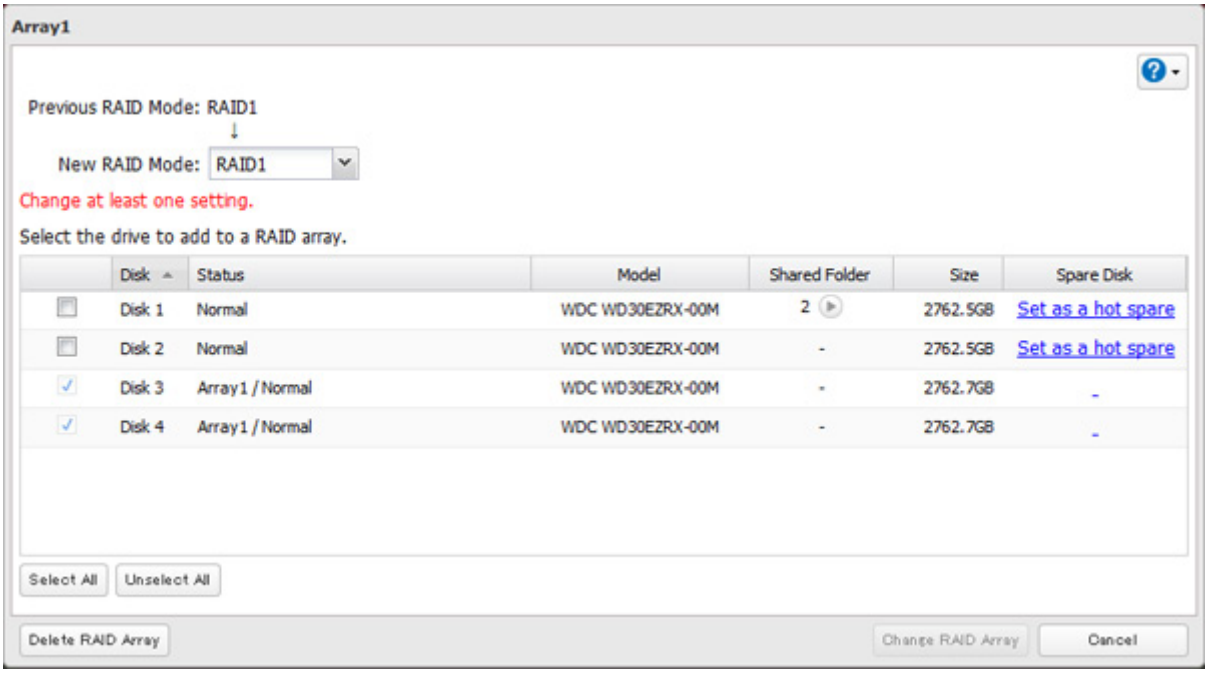
2 Click  to the right of "RAID".



3 Choose a RAID array.



4 Click *Set as a hot spare*.



5 Click *Yes*.

6 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

7 Click *OK* when finished.

Notes:

- To turn the hot spare back into a normal disk, choose *Set as a normal disk*.
- If a drive fails in the RAID array before it is rebooted, the hot spare will not automatically replace the failed drive. In this case, follow the procedure below to repair the array.

(1) In Settings, navigate to *Drives - Drives*.

(2) Click the drive that was configured as a hot spare, then click *Dismount Disk*.

(3) Click *Rediscover Disk*.

(4) Navigate to *Drives - RAID*.

(5) Choose the RAID array to repair.

(6) Click the drive that was previously configured as a hot spare, then click *Recover RAID Array*.

This will rebuild the RAID array.

RMM (RAID Mode Manager)

With RMM, you can create or expand a RAID array without erasing the data on the drives.

Changing from JBOD to RAID 1

You must have at least two drives available in JBOD (not in a RAID array) to build the RAID 1 array with RMM.

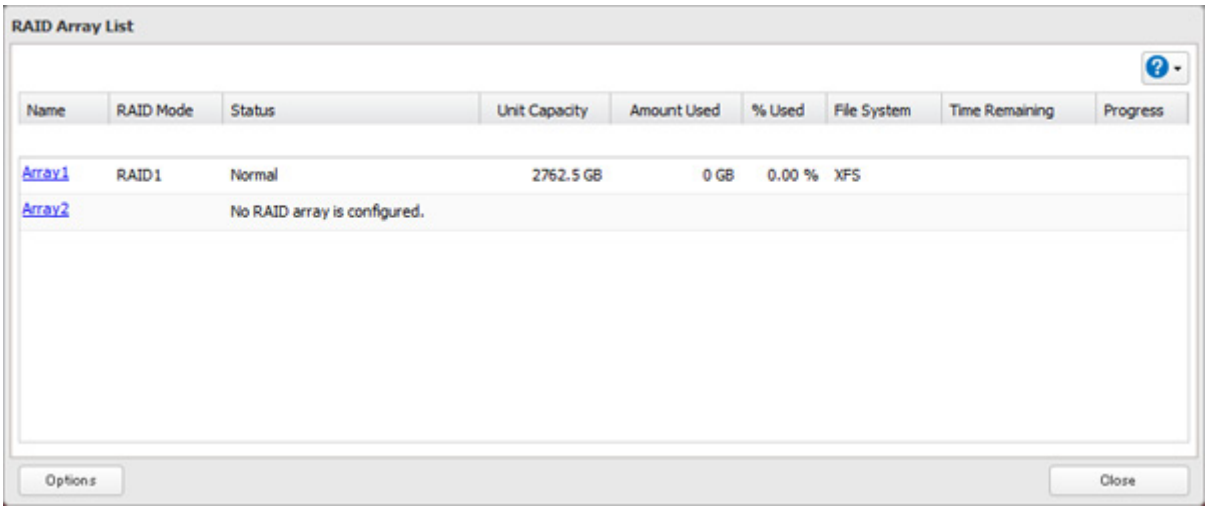
1 In Settings, click *Drives*.



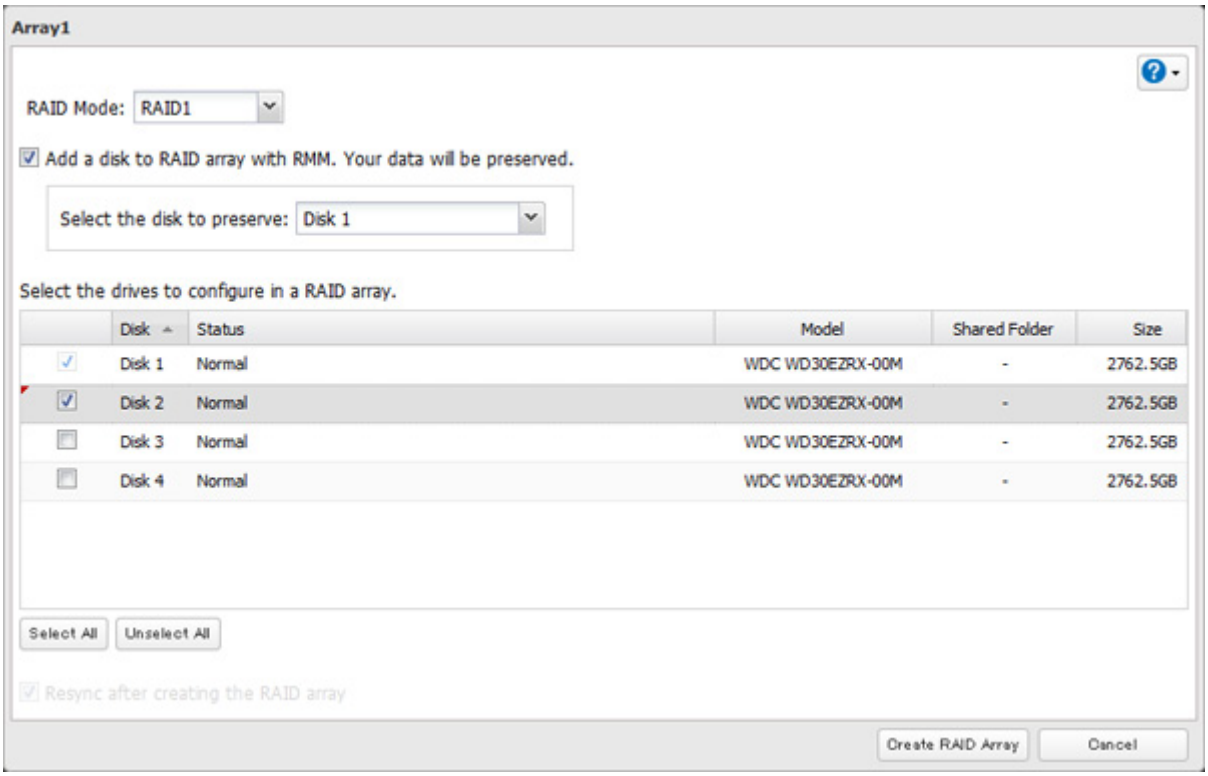
2 Click  to the right of "RAID".



3 Choose a RAID array.



4 Set the RAID mode to "RAID 1".



5 Select the "Add a disk to RAID array with RMM. Your data will be preserved." checkbox.

6 Select the drive whose data will be saved from the drop-down list.

7 Select the drive to add to the RAID array.

8 Click *Create RAID Array*.

9 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

10 Click *OK* when finished.

Adding a Drive to an Existing RAID Array or Changing the RAID Mode While Adding a Drive

You can add a drive to a RAID 1, RAID 5, or RAID 6 array. Drives in JBOD can be added to the RAID array.

Note: RMM can be used to expand an array by one drive per operation. To expand by two or more drives, RMM must be performed multiple times.

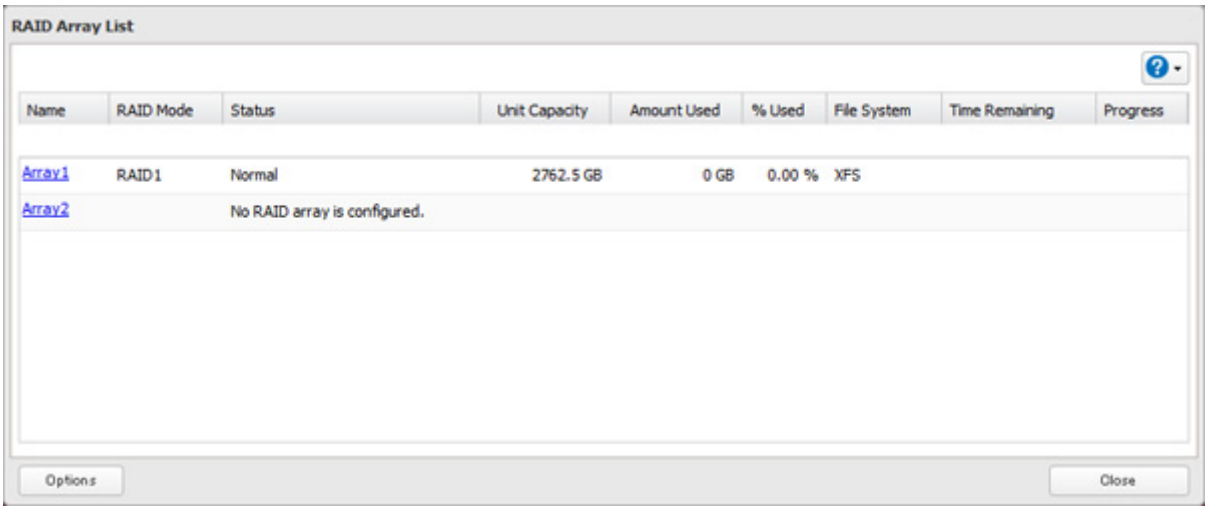
1 In Settings, click *Drives*.



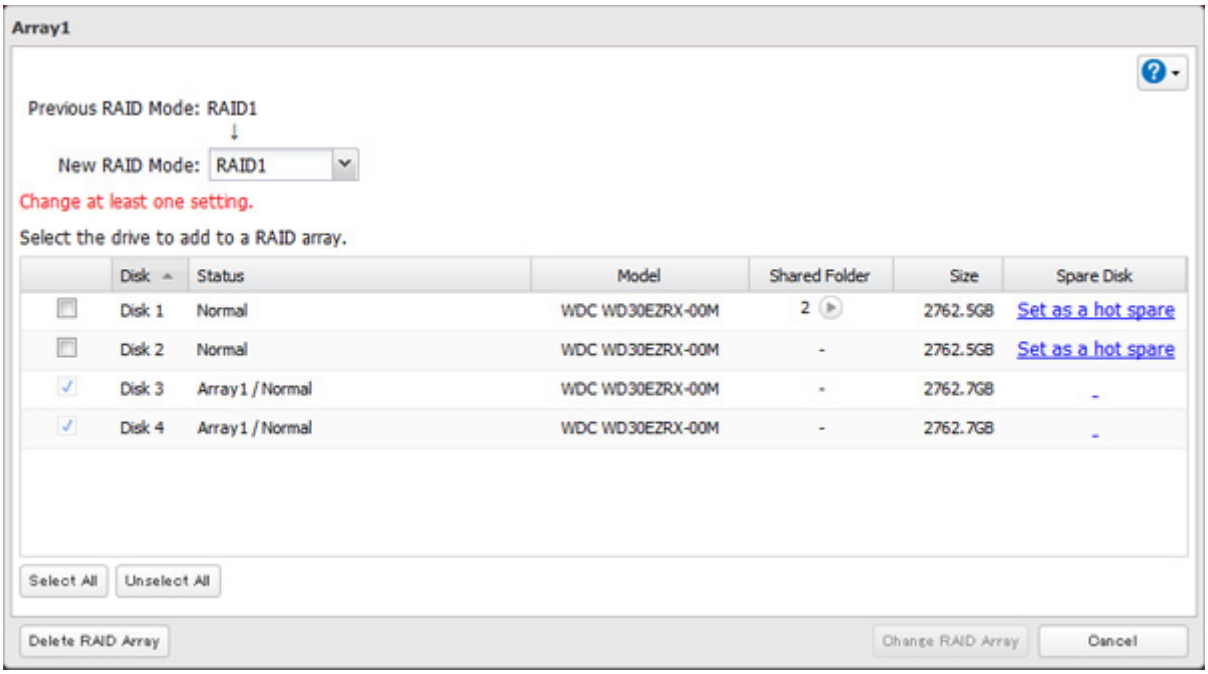
2 Click  to the right of "RAID".



3 Choose a RAID array.



4 Select one drive to add to the RAID array. If changing the RAID mode, choose the desired mode for the array from the drop-down list. If not, keep the scurrent RAID mode as is.



5 Click *Change RAID Array*.

6 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

7 Click *OK* when finished.

RAID Scanning

A RAID scan checks you RAID array for bad sectors and if it finds any, it automatically repairs them. Arrays other than RAID 0 are supported. For best results, run a RAID scan regularly.

1 In Settings, click *Drives*.



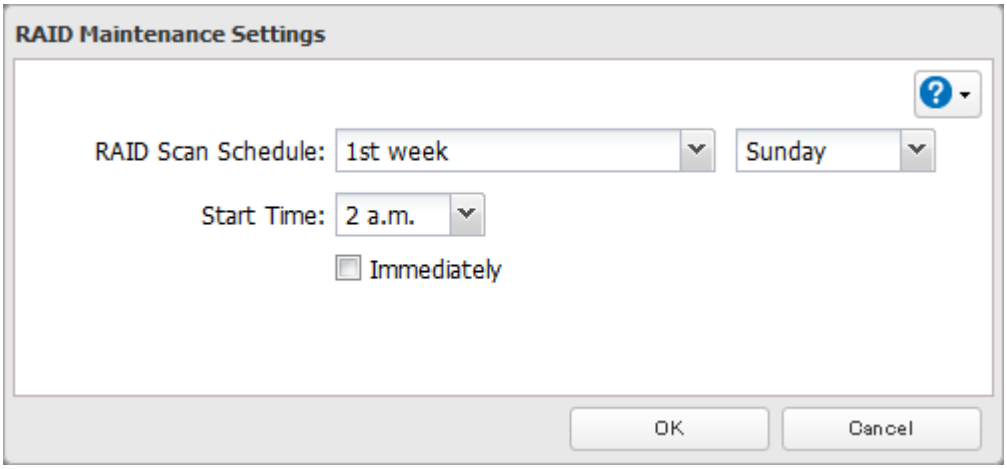
2 Move the RAID scanning switch to the  position to enable RAID scanning.



3 Click  to the right of "RAID Scanning".

4 Click *Edit*.

5 Select when to run the scan and click *OK*.



Notes:

- Select the "Immediately" checkbox to run a RAID scan immediately.
- To stop a RAID scan, click *Cancel RAID Scan*.

Adding an External Hard Drive

Connecting an External Drive

Your TeraStation includes USB ports (the number of ports depends on your model), and you can connect external drives to these ports. Once connected, they appear as shared folders on the TeraStation. Formatted drives are detected automatically. Unformatted drives should be formatted in Settings.

After a USB drive is recognized, Windows adds "usbdisk x" in File Explorer, where "x" is the USB port which the hard drive is connected.

Compatibility

The following USB devices are supported by the TeraStation:

- USB storage devices
- Card readers (except for card readers that can recognize two or more memory cards)

Buffalo external USB drives are recommended but DUB and DIU series drives are not supported.

Supported file systems for external drives are below:

- FAT32
- EXT3
- XFS
- NTFS
- HFS Plus (read-only)

Connect only one device to each USB port of the TeraStation. Some external drives with automatic power-on don't turn on automatically when connected to the TeraStation. Use their manual power switch to turn them on. Be sure to connect only one bus-powered drive at a time. If there is insufficient bus power for your USB drive, connect its AC adapter. Note that only the first partition of a connected USB hard drive is mounted. Additional partitions are not recognized. Do not connect bus-powered devices to the 2-drive TeraStation models.

Notes:

- Backup data from macOS may include characters that cannot be written to FAT16 or FAT32 drives such as ".DS_Store". For best results, reformat the drive before using it as a backup target.
- If your USB 3.0 hard drive is not reconfigured after rebooting the TeraStation, unplug and reconnect it.

Dismounting Drives

If the TeraStation is powered on, dismount drives (internal and external) before unplugging them. You may dismount external drives with the function button, or any drive from Settings. If the TeraStation is off, then all drives are already dismounted and may be unplugged safely.

Note: Do not dismount internal drives while a RAID array is rebuilding or RMM is being configured. If you do, data on the drives may be lost.

Dismounting with the Function Button

Hold down the function button for 8 seconds. The function button will light up blue for 30 seconds as your USB drives are dismounted. When the dismount is finished, the function button's LED will turn off, then comes back on. You may now unplug any USB drives safely.

Note: After 60 seconds, the function LED will go out and any drives that have not yet been unplugged will be remounted.

Dismounting from Settings

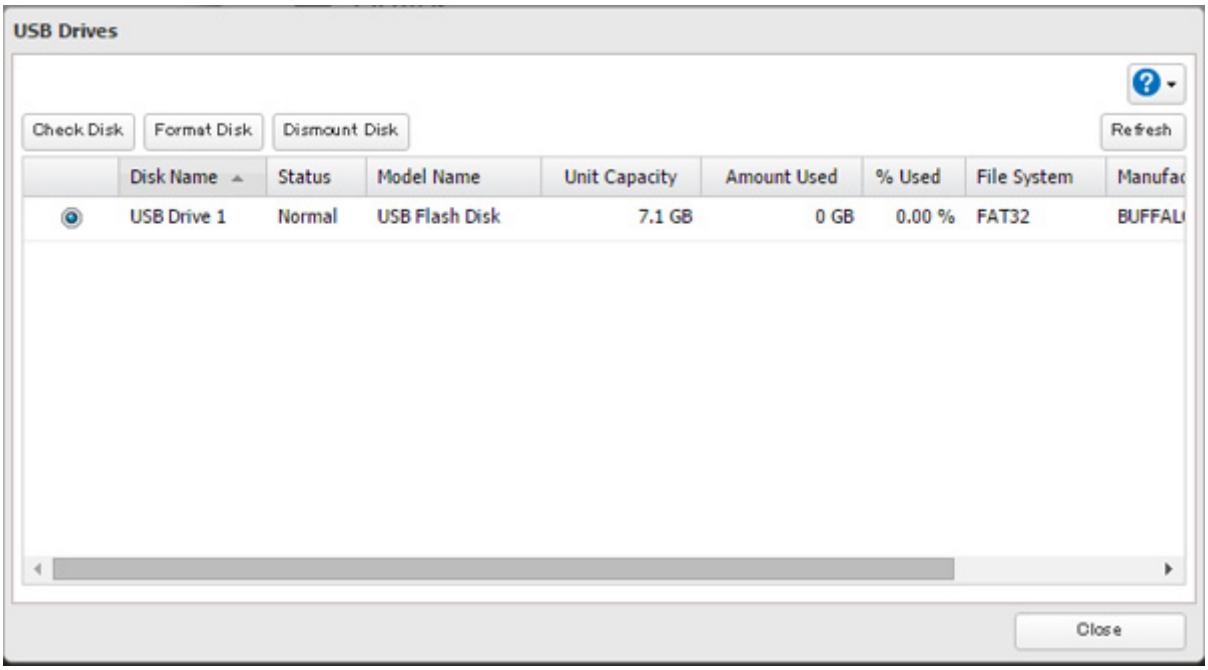
1 In Settings, click *Drives*.



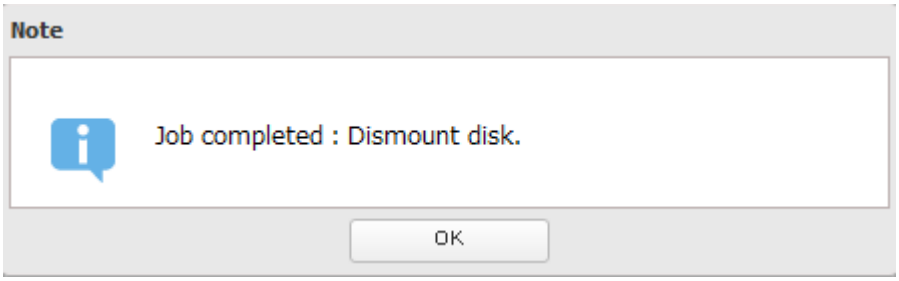
2 Click *Drives* to dismount an internal drive or *USB Drives* to dismount an external drive.



3 Select the drive to dismount and click *Dismount Disk*.



4 When the following message is displayed, it is safe to unplug the drive.



Note: To remount the drive, unplug it and then plug it back in.

Checking Drives

A drive check tests the data on a drive in the TeraStation or one that is connected via USB for integrity. Errors are fixed automatically. With large drives, a drive check may run for many hours. Shared folders cannot be accessed during a drive check. Do not turn off the TeraStation until the drive check is finished. Use the procedure below to run a drive check.

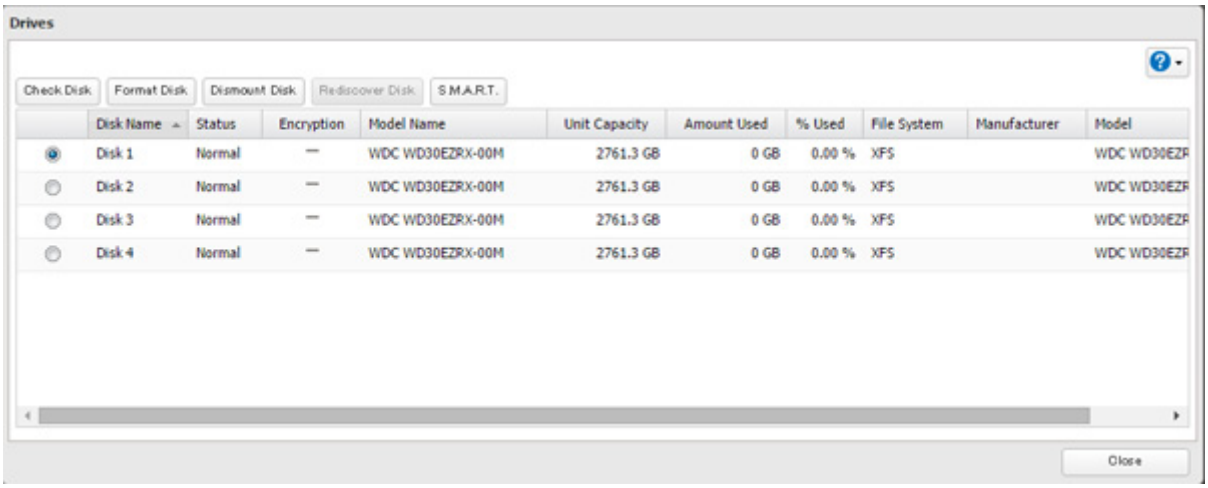
1 In Settings, click *Drives*.



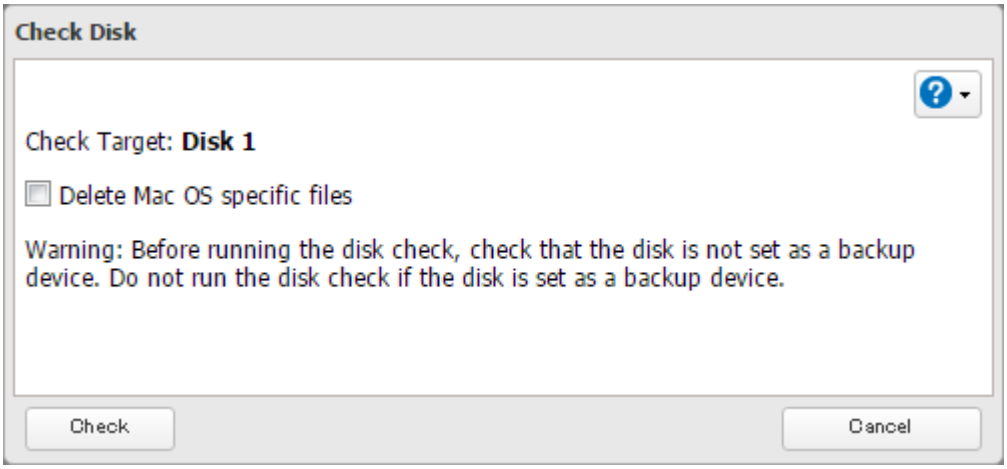
2 Select *Drives* to check an internal drive or *USB Drives* to check an external drive.



3 Select the drive or array to test, then click *Check Disk*.



4 Click *Check*. You have the option of deleting information files from macOS during the check if desired.



S.M.A.R.T.

S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) monitors internal drives to detect and report various indicators of reliability, in the hope of anticipating failures. When a failure is anticipated by S.M.A.R.T., the user may choose to replace the drive to avoid outages and data loss. Follow the procedure below to check S.M.A.R.T. information for the TeraStation's internal drives.

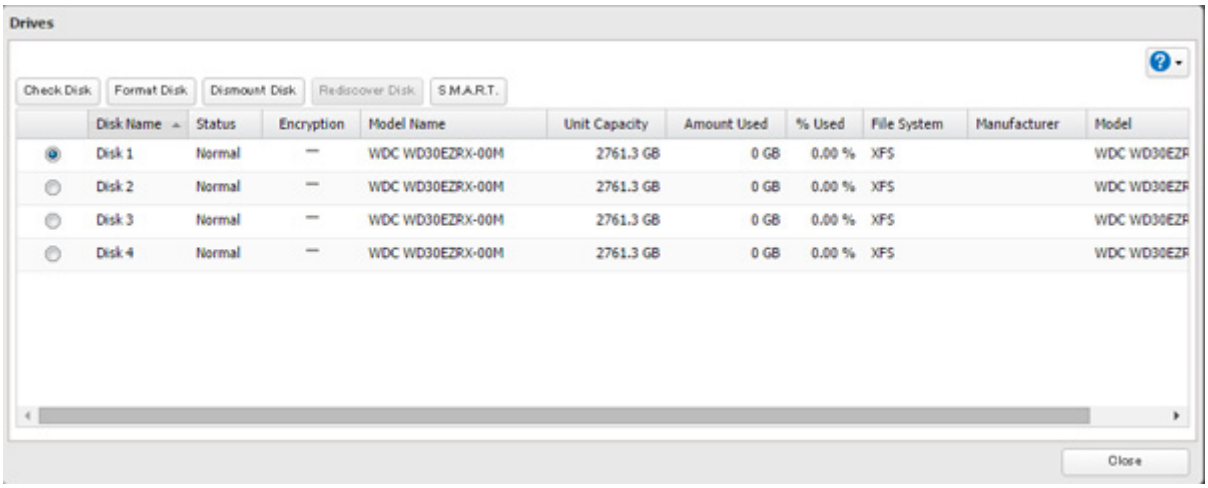
Note: S.M.A.R.T. information is only available for internal drives.

1 In Settings, click *Drives*.



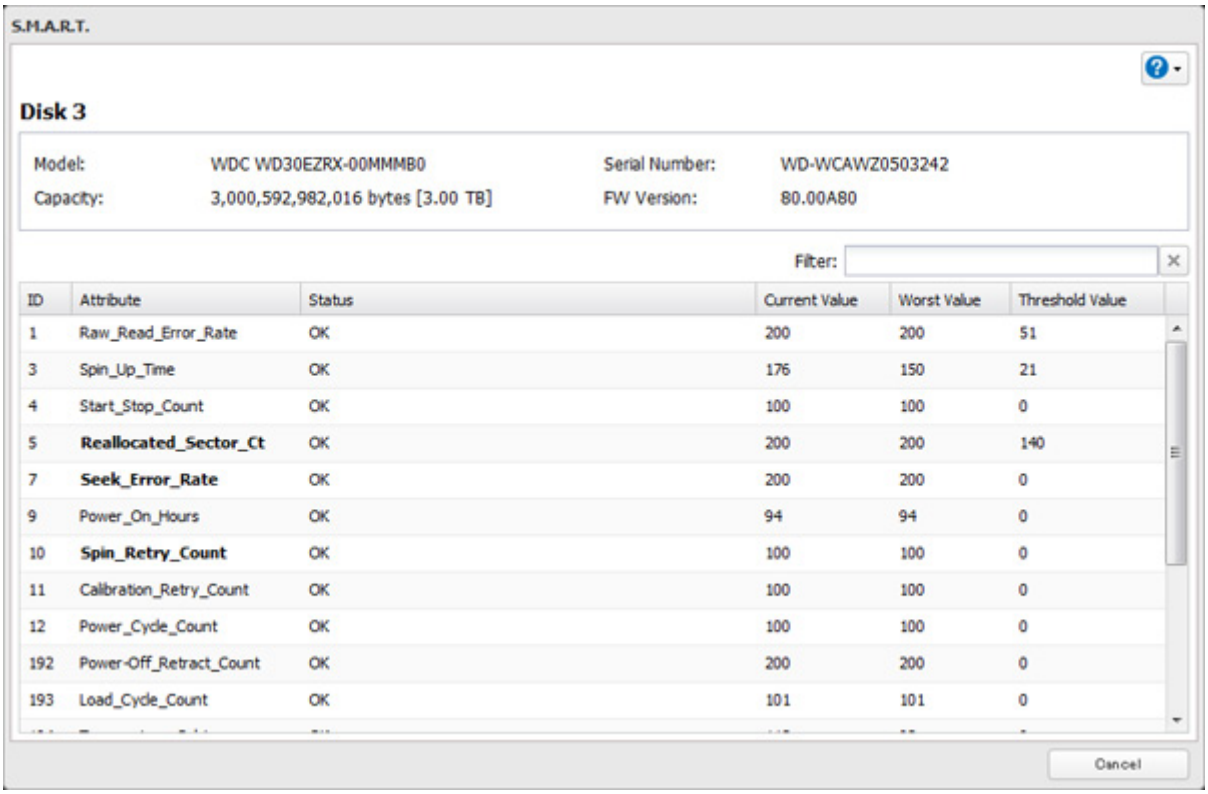
2 Click  to the right of "Drives".

3 Select a drive to check and click *S.M.A.R.T.*



4 The S.M.A.R.T. information for the drive will be displayed. Different information may be displayed depending on the brand of drives in your TeraStation. Critical attributes are displayed in bold. Attributes with current value

less than or equal to the threshold value may be significant. If an attribute reports a failure, or has had one in the past, it will be displayed in the status column.



Formatting Drives

Notes:

- Under some circumstances, data deleted when a drive is formatted can be recovered. To ensure that data is "gone forever", a format might not be sufficient. See the "Erasing Data on the TeraStation Completely" section below.
- After a drive is formatted, the "% Used" and "Amount Used" in Settings will not be 0. This is because some drive space is used for the system area.

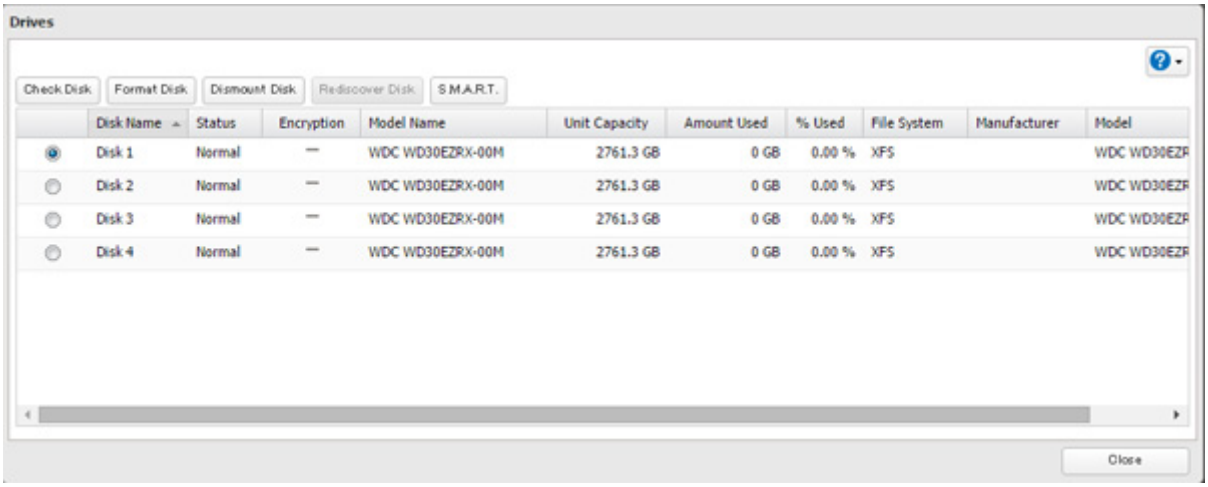
1 In Settings, click *Drives*.



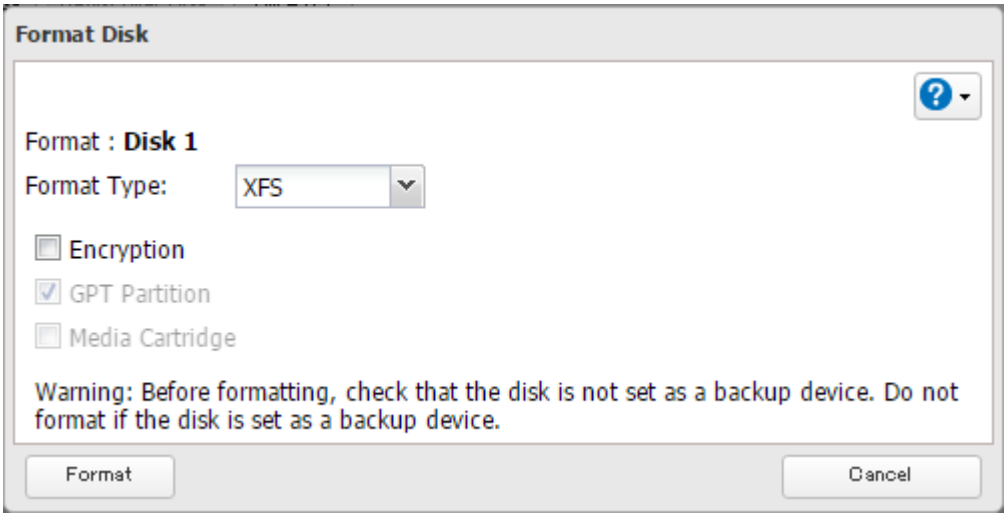
2 Select *Drives* to format an internal drive or *USB Drives* to format an external drive.



3 Select the drive or array to format, then click *Format Disk*.



4 Select a format type, then click *Format*.



5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

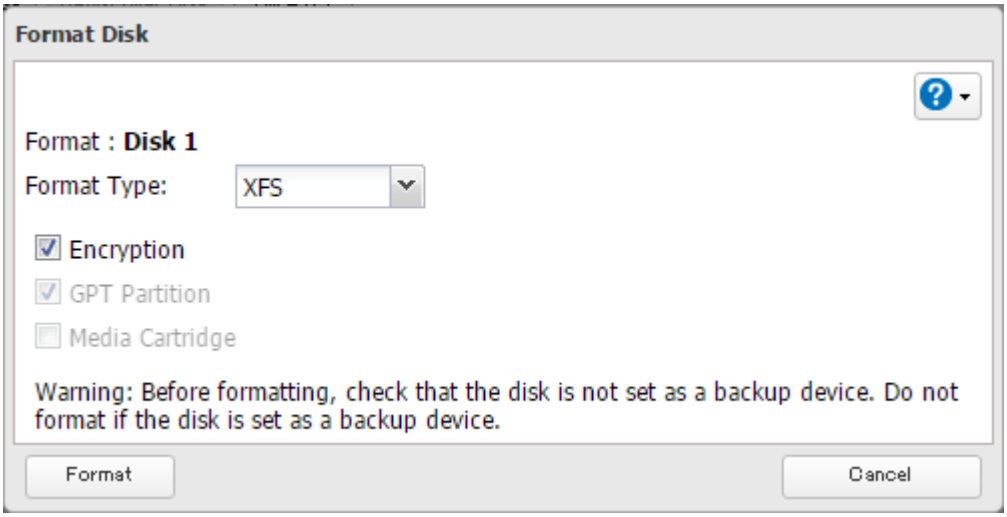
6 Depending on the size and the formatted file system of your drive, the format may take several minutes or several hours to complete. "Formatting" will be displayed on the LCD panel until the format is complete. Click *OK* when finished.

Notes:

- Do not turn off or disconnect power to the TeraStation while formatting a hard drive.
- For drives of 2.2 TB or larger, make sure that the "GPT Partition" checkbox is selected.

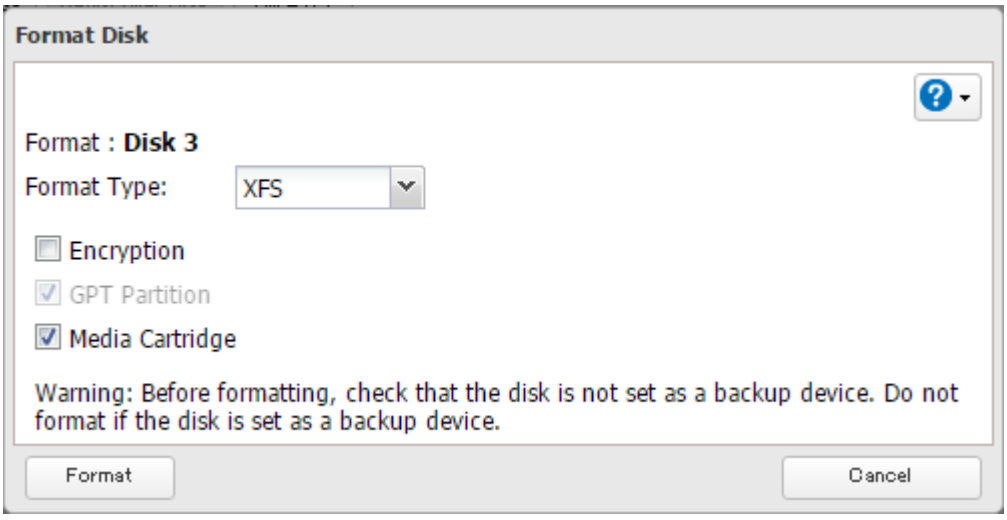
Encrypting Drives

Internal drives (and arrays) can be encrypted with 128-bit AES during formatting. Encrypted drives and arrays are then readable only from that specific TeraStation. To decrypt a drive or array, clear the "Encryption" checkbox and format it again.



Media Cartridges

If configured as a media cartridge, an internal drive can be used as a removable storage device in the same way as an external drive. Media cartridges can be unplugged and connected to a different TeraStation with all data intact. To configure a drive as a media cartridge, select the "Media Cartridge" checkbox during formatting. To return it to its original state, clear the "Media Cartridge" checkbox and reformat the drive.



Media cartridges do not support:

- RAID arrays
- LVM volumes
- Access restrictions
- Direct connection to a Windows computer
- Antivirus

Notes:

- Don't configure the boot drives (drives 1 and 2) as media cartridges.
- Configure media cartridges from the bottom drive up. For example, if your TeraStation has 4 drives, make drive 4 a media cartridge first, then drive 3 next.

- If the TeraStation fails to boot after drive 1 or 2 is replaced, remove any media cartridges, then replace them after the TeraStation has booted.

Erasing Data on the TeraStation Completely

Under some circumstances, data from formatted drives can be recovered. The drive erasure process in this section does a much more thorough job of erasing data. This procedure is recommended for removing all data from a drive in a way that makes it nearly impossible to recover with current tools. The TeraStation will then be in the following state:

- All drives in JBOD
- An empty shared folder on each drive
- All settings returned to their default values
- All logs deleted

If you remove a drive and then erase all data on the TeraStation, the LCD panel will show the E22 error message and the number of the removed drive. You can still use the TeraStation.

Follow the procedure below to completely and permanently erase all data from your TeraStation.

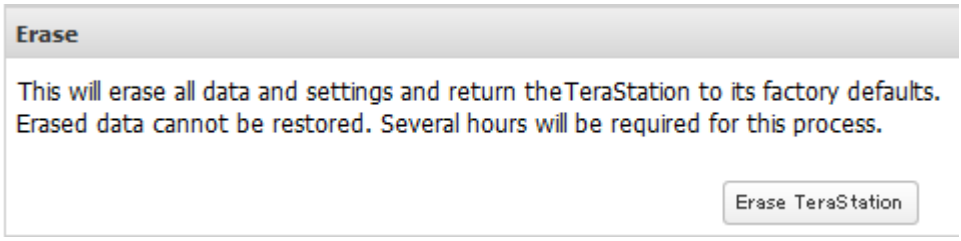
1 In Settings, click *Management*.



2 Click  to the right of "Restore/Erase".



3 Click *Erase TeraStation*.



4 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

5 All data on the TeraStation will be permanently erased.

Drive Quotas

You can set a drive quota to limit drive space for each user or group. You can also set a threshold. If the drive space exceeds the configured threshold, an email notification will be sent. To configure email notifications for the drive quota, refer to the "Email Notification" section in chapter 10.

Notes:

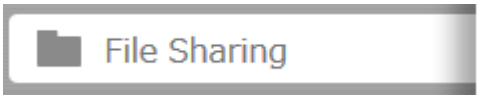
- When using quotas, disable the recycle bin or empty the trash folder often. The limited space includes the space used for trash.
- Quotas apply per drive or per array. If a quota is set to 1 GB, each array or drive can use a maximum of 1 GB.
- Quotas cannot be set for external hard drives connected to the TeraStation and hard drives that are configured as media cartridges.

- If both user and group quotas are configured for a user, the most restrictive quota will always apply.

Quotas for Users

Follow this procedure to limit the shared folder drive space available for a user.

1 In Settings, click *File Sharing*.

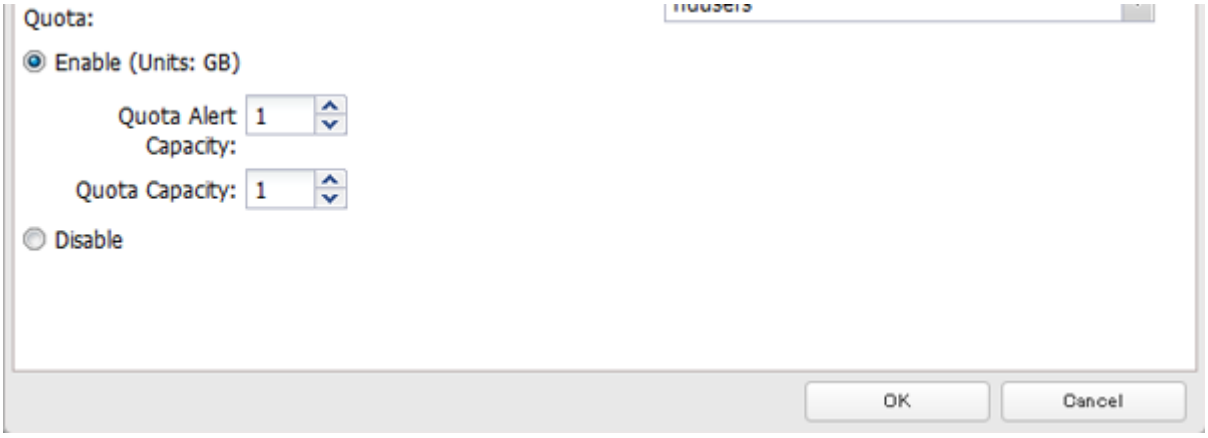


2 Click  to the right of "Users".



3 Select the user that will be given a quota and click *Edit*. If you want to set a quota for a new user, create a user by referring to the "Adding a User" section in chapter 3.

4 Enable quotas, choose the alert and the maximum amount of space the user will be allowed to use, and click *OK*.



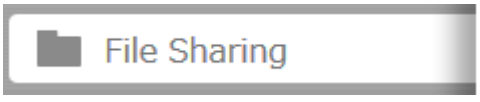
Note: If you change the primary group, restart the TeraStation to apply the quota settings.

5 Click *OK*.

Quotas for Groups

Follow the procedure below to limit the space for shared folders that each group can use.

1 In Settings, click *File Sharing*.

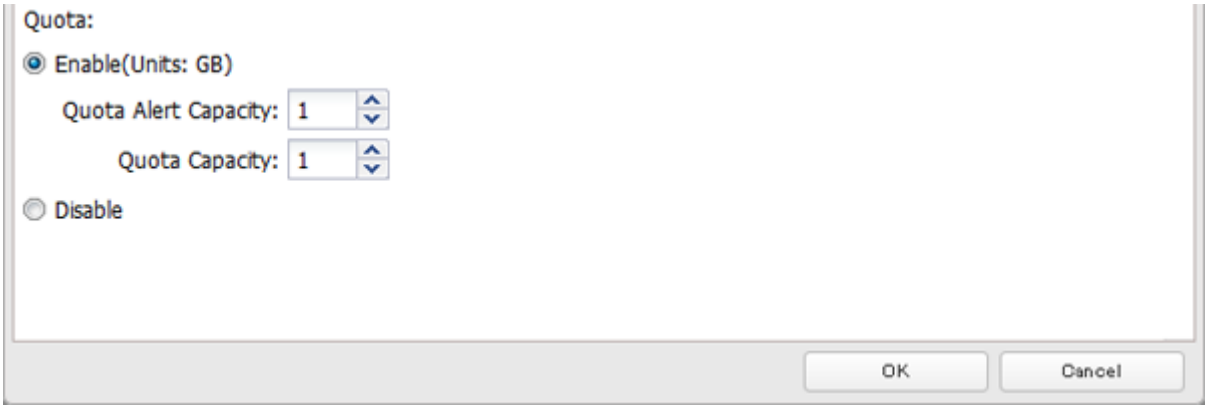


2 Click  to the right of "Groups".



3 Select the group that will be given a quota and click *Edit*. If you want to set a quota for a new group, create a group by referring to the "Adding a Group" section in chapter 3.

4 Enable quotas, choose the alert and the maximum amount of space the group is allowed, and click *OK*.



5 Click *Close*.

6 Click  to the right of "Users".



7 Select the user that will inherit the group quota settings. If you want to add a new user to group with a quota, create a user by referring to the "Adding a User" section in chapter 3.

8 Change the user's primary group to the group with the quota, then click *OK*.

9 Click *Close*.

10 Click the  icon, then select *Restart* to restart the TeraStation.

Size Limits

If LVM is enabled, volumes can be created with maximum size limits.

Note: When creating a LVM volume, all data in the area where you specified for the LVM volume will be erased. Before changing any settings, back up any important data.

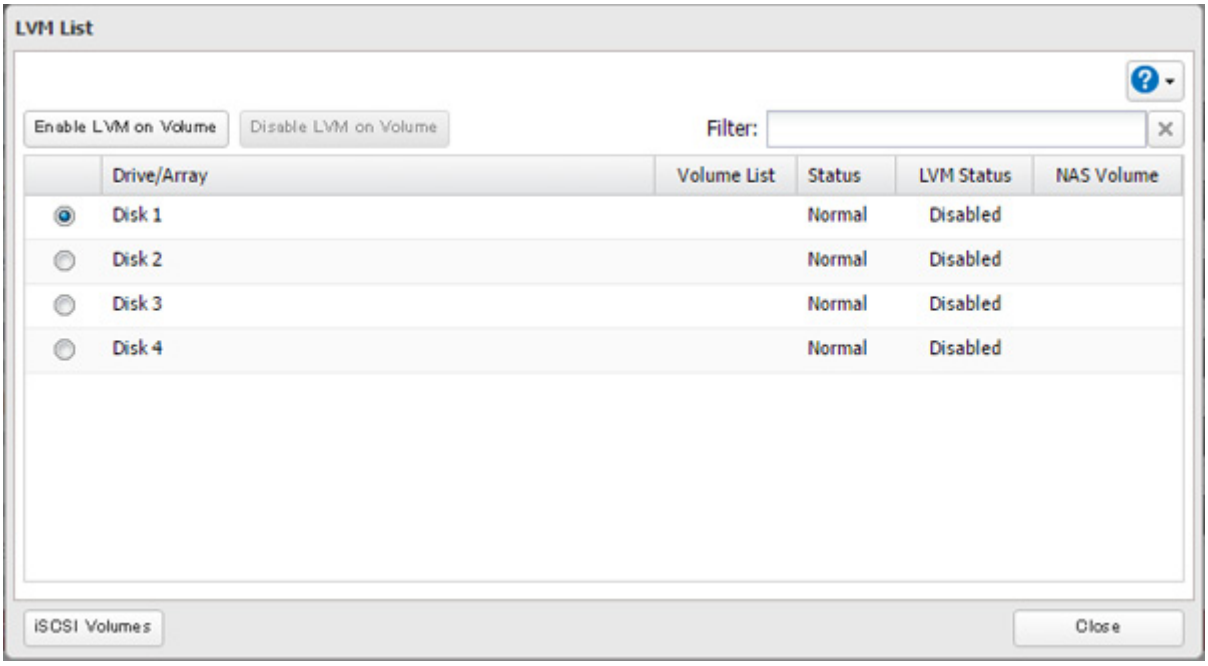
1 In Settings, click *Drives*.



2 Click  to the right of "LVM".



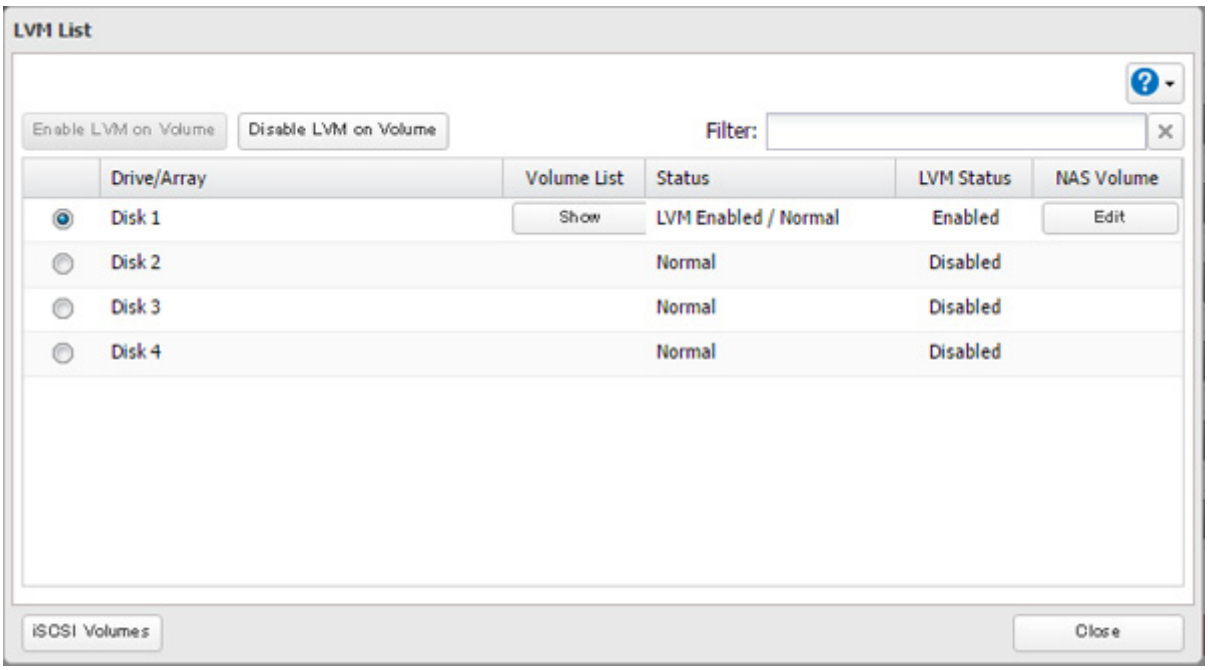
3 Select the drive or array where the volume will be located and click *Enable LVM on Volume*.



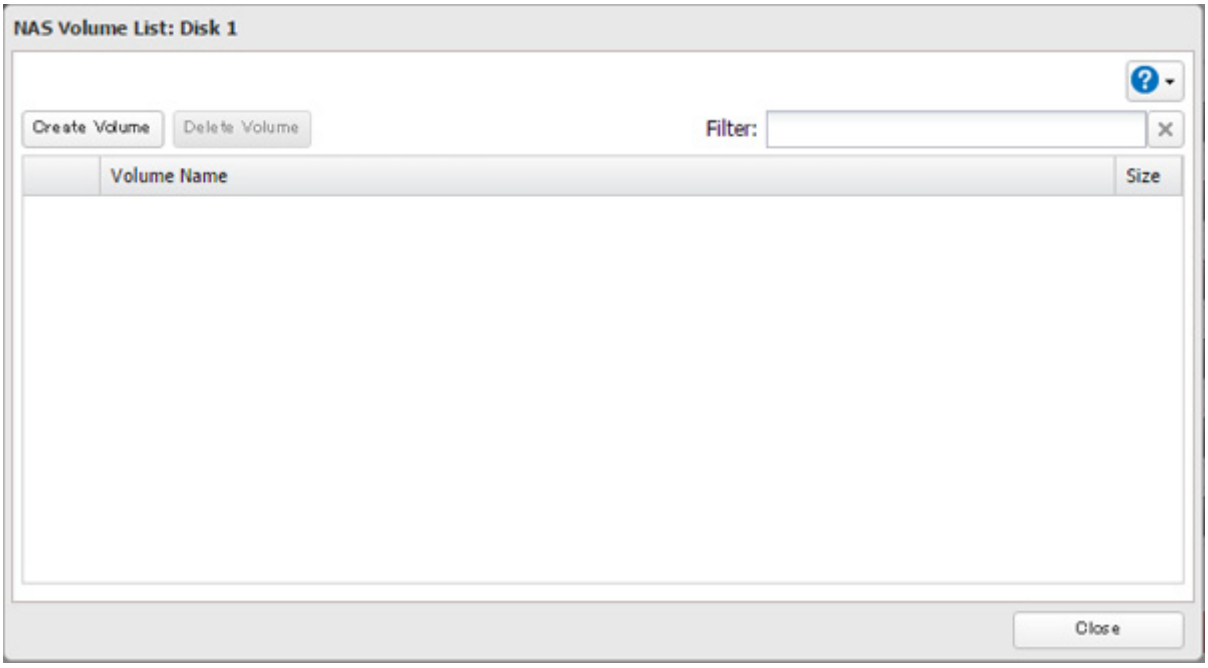
4 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

5 Click *OK*.

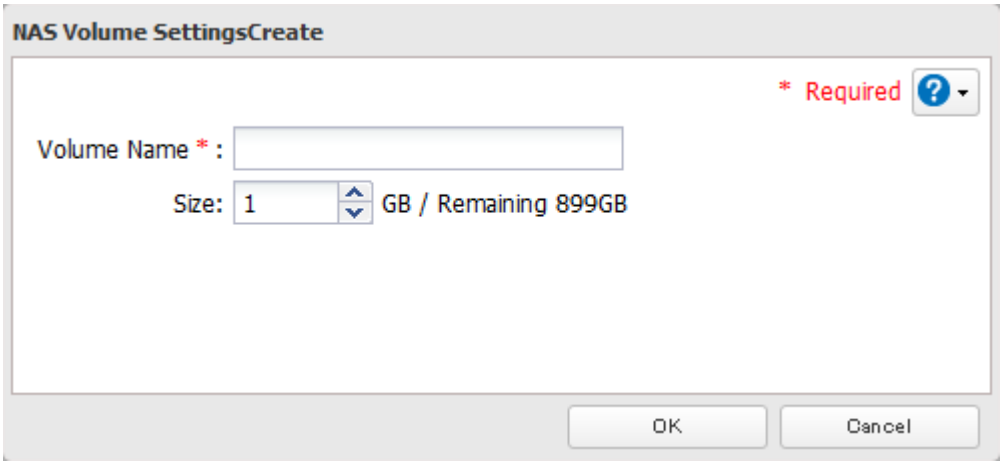
6 Click *Edit* under "NAS Volume".



7 Click *Create Volume*.



8 Configure the desired settings, then click *OK*.



9 Click *OK*.

10 Click *Close*.

11 Click *Close*.

12 Navigate to *File Sharing - Folder Setup*.



13 Click *Create Folder*.

14 Configure the settings.

15 Select the volume that you created for "Volume" and click *OK*.

Notes:

- If shared folders are created in LVM volumes, the antivirus software may not work properly. For best results, disable LVM before use.
- If you click *Show* under "Volume List", the volumes will be listed on the screen and you can see if these volumes are being used as iSCSI or NAS.
- Do not use any of the following words for the name of a volume as these words are reserved for internal use by the TeraStation: array x, authtest, disk x, global, homes, info, lost+found, lp, mediacartridge x, msdfs_root, mt-daapd, printers, ram, spool, usbdisk x. Any instances of "x" denote a number (for example: array1 or disk3)
- If an LVM volume could not be mounted, try restarting the TeraStation. If an issue still exists, delete and recreate the LVM volume. Deleting the LVM volume will erase data on the volume.

Using the TeraStation as an iSCSI Device

Introduction

iSCSI is a protocol for carrying SCSI commands over IP networks. Unlike traditional SAN protocols such as Fibre Channel, which requires special-purpose cabling, iSCSI can be run over long distances using existing network infrastructure. Normal Windows formatting such as NTFS is supported.

Differences Between NAS and iSCSI

With iSCSI, the TeraStation is connected to a single computer, such as a server. Other computers on the network access files on the TeraStation through the computer it's connected to. The TeraStation can be used as a local drive from Windows Server. Features of Windows Server such as Active Directory can be used normally.
As a NAS, the TeraStation is a server, and computers (including other servers) on the network can access shared folders on it directly. A separate server is not required, and features such as backup are built-in.

Network Configuration

Use gigabit or faster network equipment with iSCSI. For best results, a dedicated network for iSCSI is recommended, separate from the regular network. Use static IP addresses for storage devices such as the TeraStation.

Installing a Connection Tool

Windows XP, Windows Server 2003

Before using any iSCSI equipment, download and install the iSCSI connection software "Microsoft iSCSI Software Initiator" from the Microsoft website.
If using TeraStation 5000 series, you can also use Buffalo iSCSI Connection Tool to connect to an iSCSI hard drive.

Windows Vista or later, Windows Server 2008 or later

The Microsoft iSCSI Software Initiator is already installed on your computer. You don't need to download and install it.
If using TeraStation 5000 series, you can also use Buffalo iSCSI Connection Tool to connect to an iSCSI hard drive on except for Windows 10. If you are using Windows 10, use Microsoft iSCSI Software Initiator.

Creating an iSCSI Volume

To use the TeraStation as an iSCSI hard drive, create a volume first. Configure the TeraStation as described below.

Notes:

- If the volume settings are changed, all data on the volume will be erased. Before changing any settings, back up any important data.
- The TeraStation can have up to 255 volumes, but we recommend creating no more than 32. Exceeding this volume amount may cause irreparable damage to the unit.
- Do not use any of the following words for the name of a volume as these words are reserved for internal use by the TeraStation: array x, authtest, disk x, global, homes, info, lost+found, lp, mediacartridge x, msdfs_root, mt-daapd, printers, ram, spool, usbdisk x. Any instances of "x" denote a number (for example: array1 or disk3)

1 In Settings, click *Drives*.



2 If you want to specify a volume size or change it later, enable LVM by referring to the "Size Limits" section above. LVM does not need to be enabled for a drive or array to be used as an iSCSI hard drive, as you can still create an iSCSI volume from the entire drive or array. However, enabling LVM is recommended for drives or arrays that will be used for iSCSI.

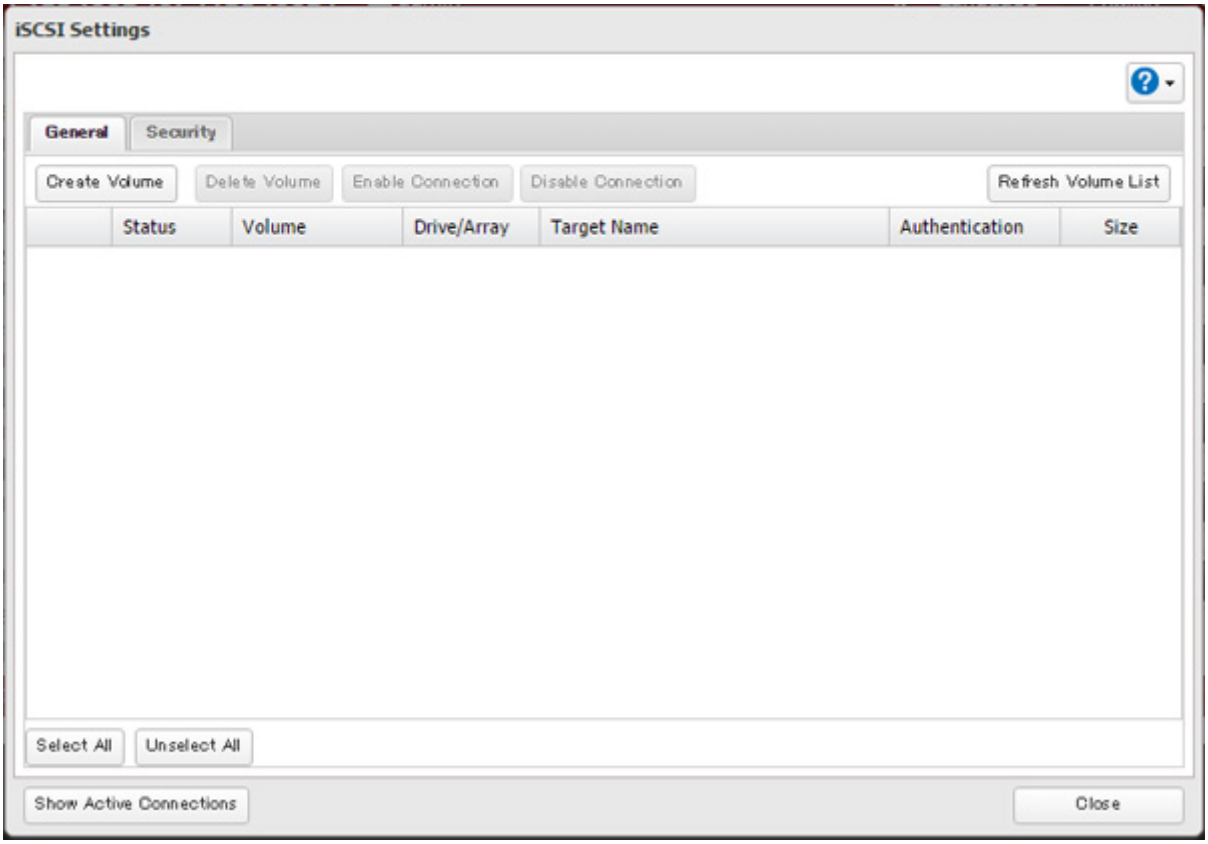
To use the whole drive or array as an iSCSI hard drive, proceed to the next step.

3 Move the iSCSI switch to the  position to enable iSCSI.



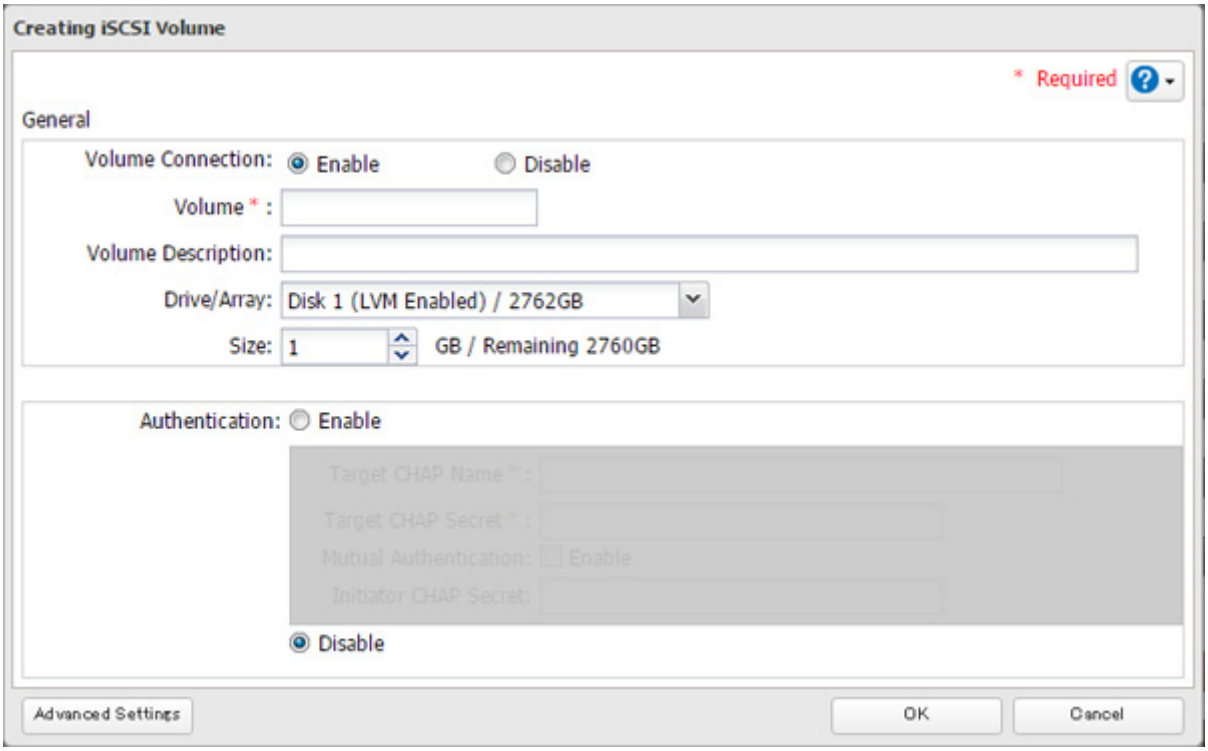
4 Click  to the right of "iSCSI".

5 Click *Create Volume*.



6 Enter a volume name, volume description, drive or array where a volume will be created, and volume size (if you enabled LVM). Click *OK* when finished.

The volume size that you specify here can be changed later. To change the volume size, refer to the "Expanding Volume Sizes" section below.



7 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

8 Click *OK*, then *Close*.

Note: If you click *Disable Connection* for the selected volume in *Drives - iSCSI* in Settings, the selected iSCSI volume can no longer be accessed. If you click *Enable Connection*, the volume will become accessible from the iSCSI initiator software.

Connecting or Disconnecting Volumes

There are two methods to connect or disconnect volumes. One uses the pre-installed Microsoft iSCSI Initiator on Windows; the other uses Buffalo iSCSI Connection Tool. The method to use Buffalo iSCSI Connection Tool is available only to customers with TeraStation 5000 series.

Note: By default, the IP address of the TeraStation is automatically assigned from a DHCP server. However, in this case, if you turn off and restart the TeraStation, the IP address may be changed and the volumes on the TeraStation may not be accessible. To avoid changing the IP address unexpectedly, using a static IP address for the TeraStation is recommended.

Using Microsoft iSCSI Initiator

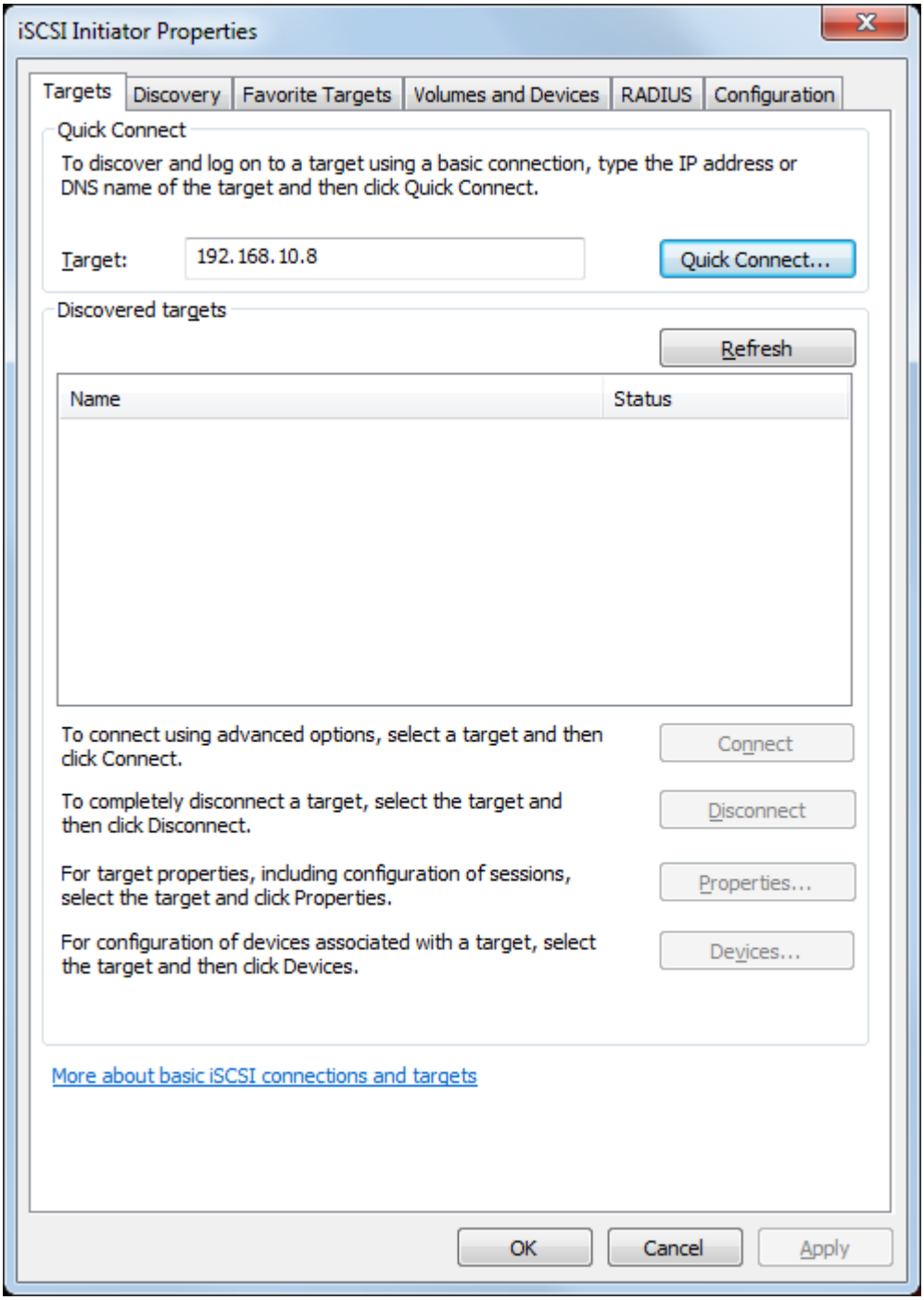
Connecting Volumes

To connect a volume using Microsoft iSCSI Initiator from a Windows computer, follow the procedure below.

Note: Do not shut down the TeraStation while connecting to an iSCSI volume. It may cause unexpected data erasure. Make sure all connections are disconnected before shutdown.

1 In Windows, navigate to *Control Panel - Administrative Tools - iSCSI Initiator*.

2 Enter the IP address of the TeraStation into the "Target" field and click *Quick Connect*.



3 Confirm if the connection is established and click *Done*.

Connecting a volume is finished.

Formatting Volumes

If using the connected volume for the first time, the volume should be formatted to be used as a local drive. Follow the procedure below for formatting.

1 In Windows, navigate to *Control Panel - Administrative Tools - Computer Management*.

2 Click *Disk Management*.

When the "Initialize Disk" screen is displayed, click *OK* without changing any settings.

3 Right-click the disk volume that shows the status "Unallocated" and click *New Simple Volume* from the displayed menu. Follow the screen to finish formatting.

Formatting a volume is finished. When the formatting process is completed, the drive will be visible as an icon in Computer or My Computer and can be used as a normal drive on the computer.

Disconnecting a Volume

1 In Windows, navigate to *Control Panel - Administrative Tools - iSCSI Initiator*.
The status of the connecting volume will be displayed as "Connected" under "Discovered targets".

2 Select a volume to disconnect and click *Disconnect*.

3 Click *Yes*.

4 When the volume status is displayed as "Inactive", the disconnection was carried out properly.

Using Buffalo iSCSI Connection Tool

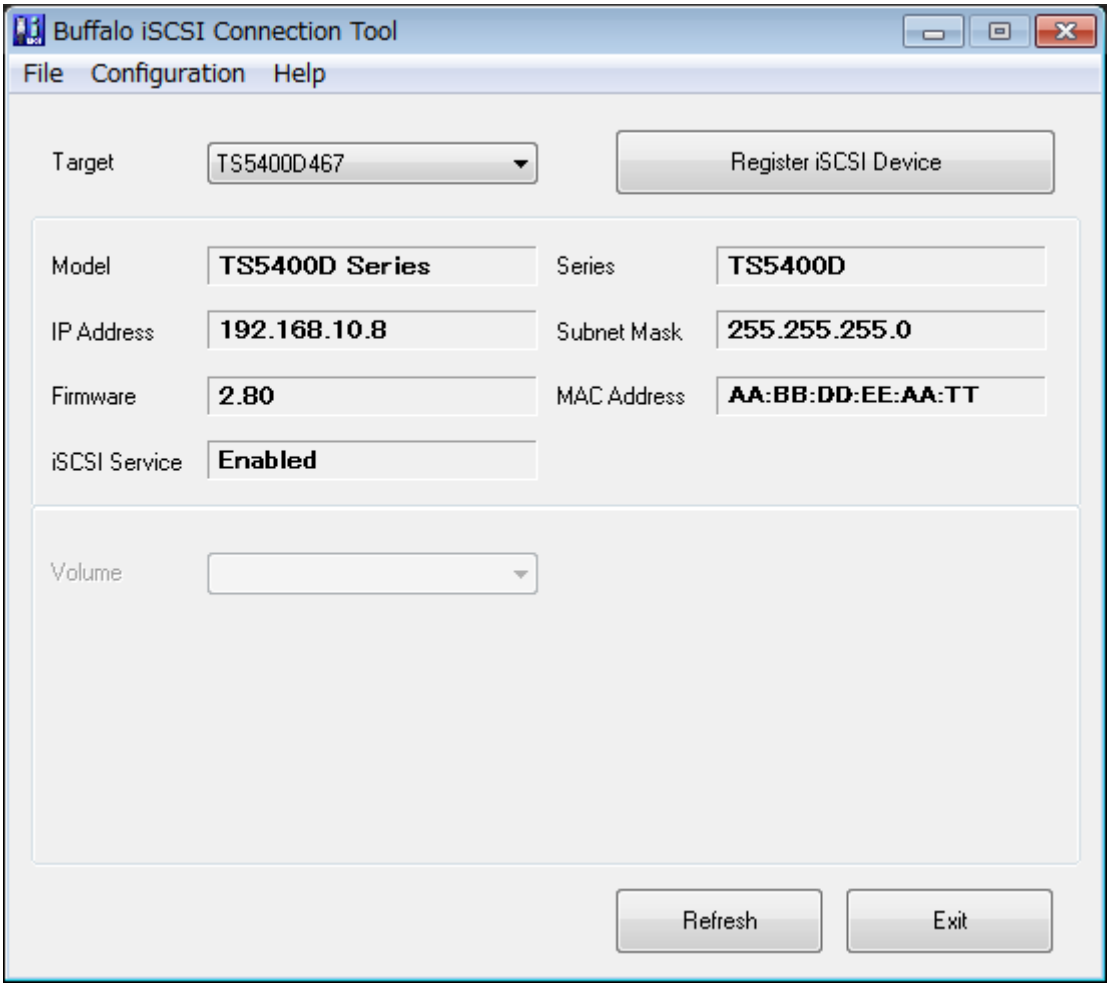
Connecting a Volume

To connect a volume using Buffalo iSCSI Connection Tool from a Windows computer, follow the procedure below.

Note: This section uses the TS5400D as an example; the procedure below can be used with other TeraStation models as well.

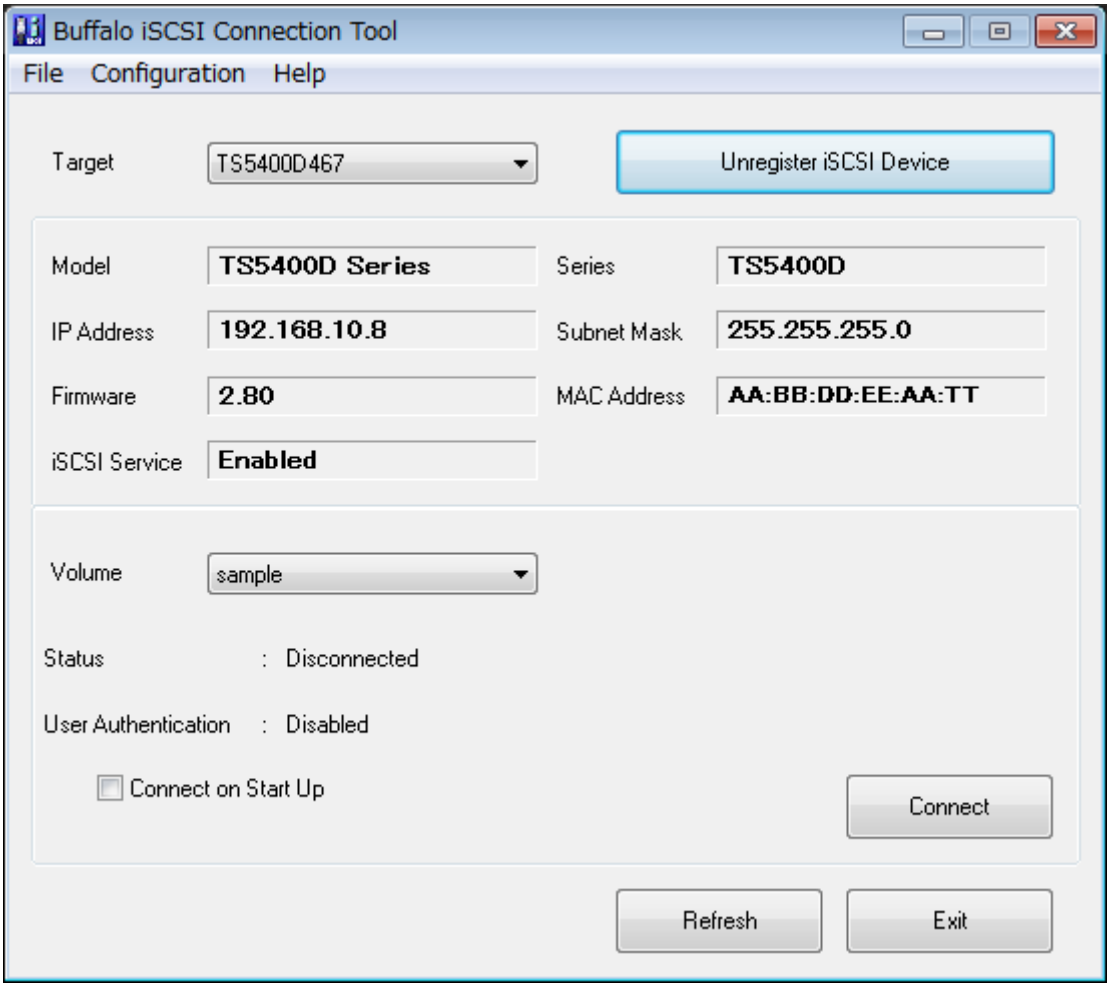
1 Click *Start - Programs - Buffalo - iSCSI Connection Tool - iSCSI Connection Tool*.
iSCSI Connection Tool will open.

2 Select the TeraStation name from the drop-down list of "Target" and click *Register iSCSI Device*.



3 Click *OK*.

4 Select a volume to connect from the drop-down list of "Volume" and click *Connect*.



5 Click *OK*.

Connecting a volume is finished.

Formatting Volumes

If using the connected volume for the first time, the volume should be formatted to be used as a local drive. Follow the procedure below for formatting.

1 In Windows, navigate to *Control Panel - Administrative Tools - Computer Management*.

2 Click *Disk Management*.
When the "Initialize Disk" screen is displayed, click *OK* without changing any settings.

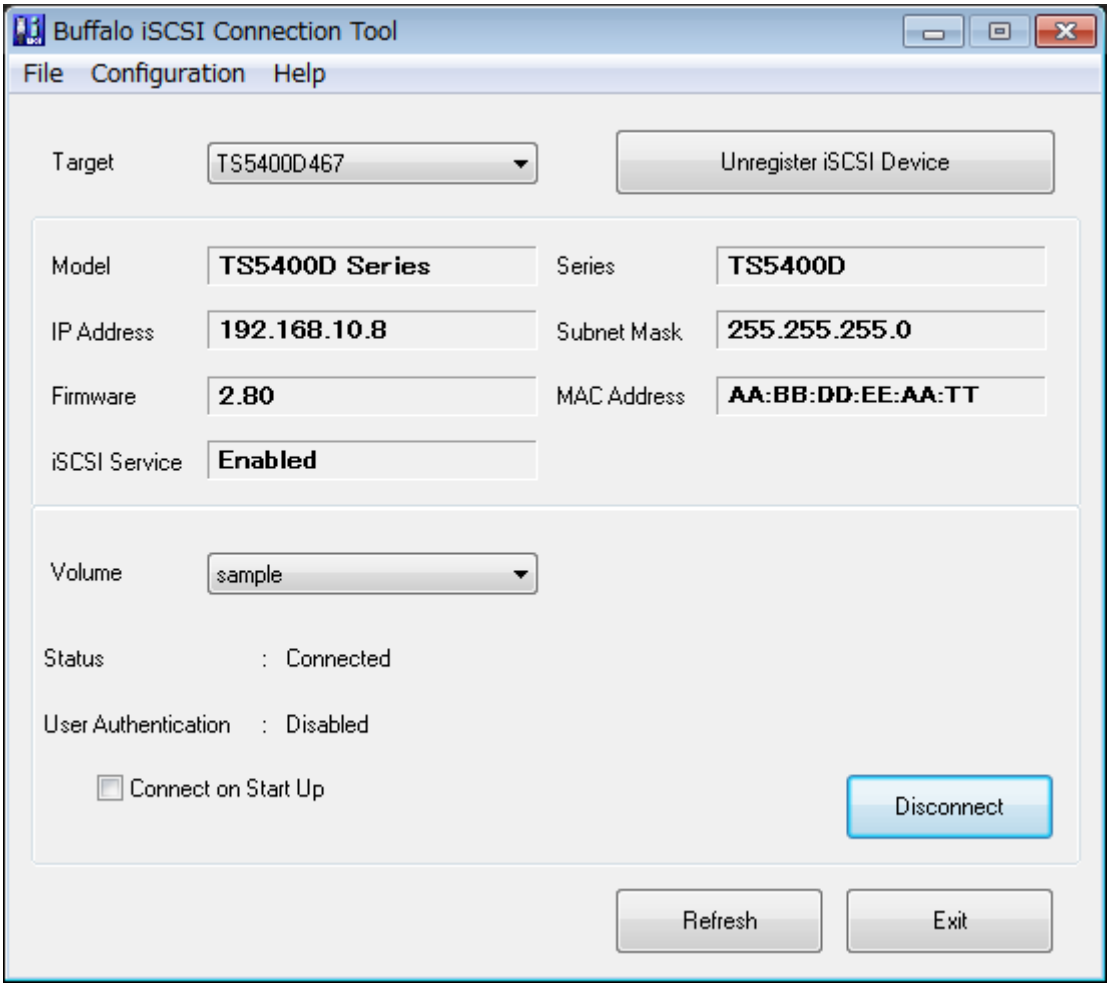
3 Right-click the disk volume that shows the status "Unallocated" and click *New Simple Volume* from the displayed menu. Follow the screen to finish formatting.

Formatting a volume is finished. When the formatting process is completed, the drive will be visible as an icon in Computer or My Computer and can be used as a normal drive on the computer.

Disconnecting a Volume

1 Click *Start - Programs - Buffalo - iSCSI Connection Tool - iSCSI Connection Tool*.
iSCSI Connection Tool will open.

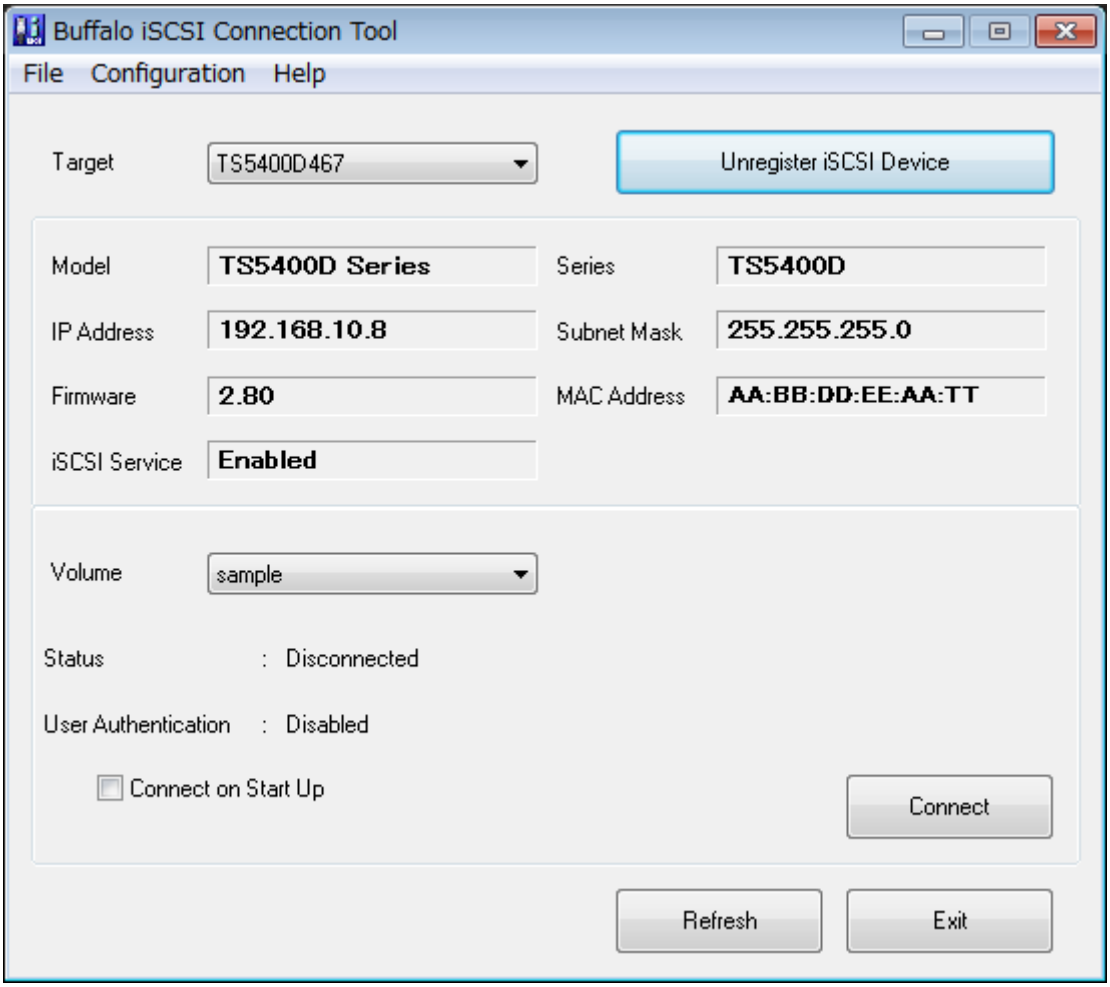
2 Select a volume to disconnect from the drop-down list of "Volume" and click *Disconnect*.



3 Click *Yes*.

4 Click *OK*.

5 Select the TeraStation name from the drop-down list of "Target" and click *Unregister iSCSI Device*.



6 Click *OK*.

Using with Multiple Computers

If the TeraStation is divided into multiple volumes (or drives), it can be used with multiple computers. However, multiple computers cannot be accessed from one volume (or one drive) at the same time.

Checking Whether iSCSI Volume Is Connected

To check whether an iSCSI volume is connected, navigate to *Drives - iSCSI*. Current volumes will be listed. If "Connected" is displayed under "Connection", the volume is currently connected to the client.

Configuring Access Restrictions

A CHAP name and secret can be configured for the entire iSCSI volume or each existing volume. Access restrictions can be configured so that entering a target CHAP name and secret is required for each connection.
The TeraStation can perform mutual authentication (two-way authentication). Dual passwords ensure that only authorized client computers can access the volume on the TeraStation.
Follow the procedure below to enable access restrictions.

Configuring Access Restrictions for the Entire TeraStation

1 In Settings, click *Drives*.

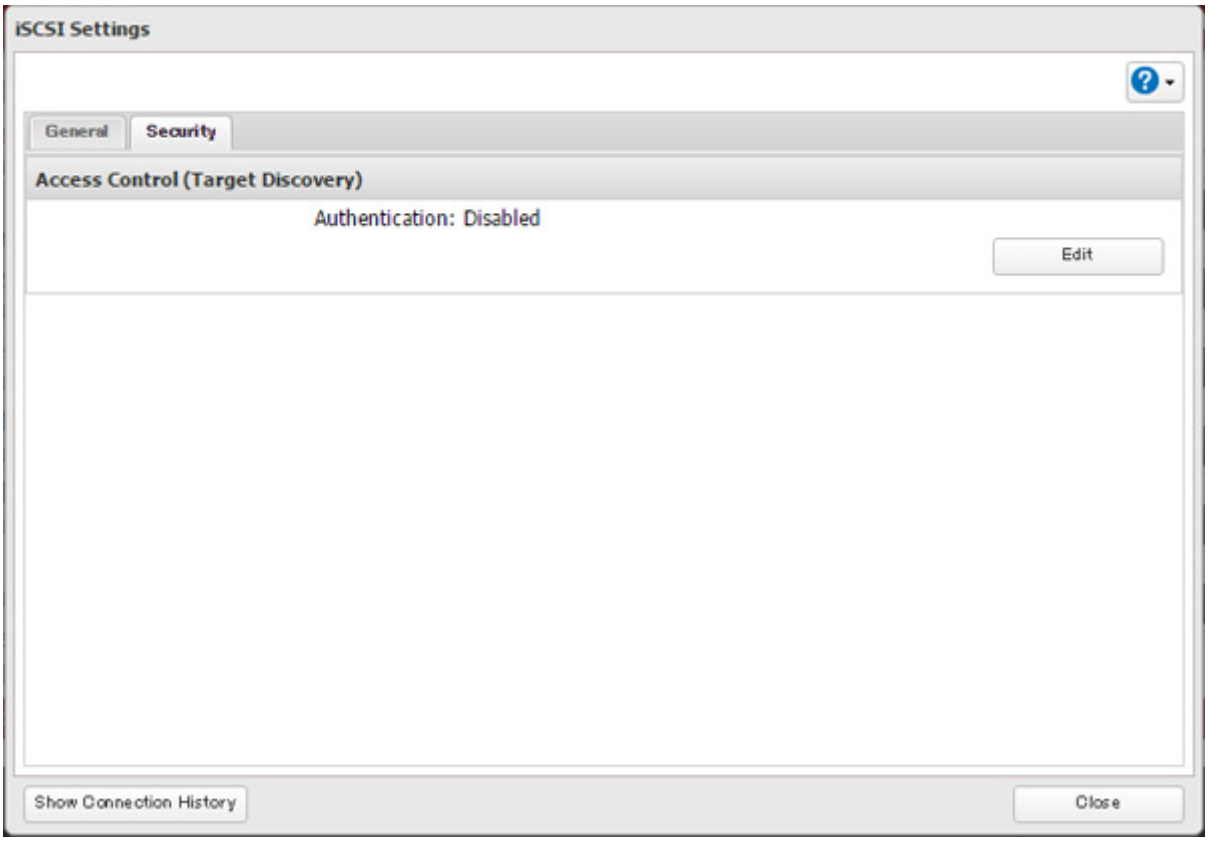


2 Click  to the right of "iSCSI".

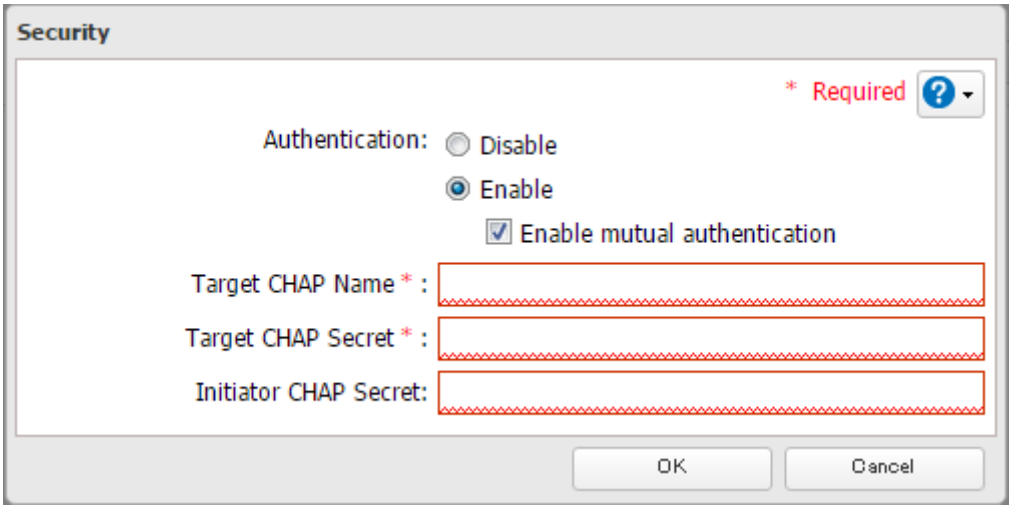


3 Click the *Security* tab.

4 Click *Edit* under "Access Control (Target Discovery)".



5 Enable authentication, enter the target CHAP name and secret, and click *OK*.



Note: To enable mutual authentication in addition to target CHAP name and secret authentication, select the "Enable mutual authentication" checkbox and enter the initiator CHAP secret.
To search or connect the volume which has mutual authentication enabled from Microsoft iSCSI Initiator, initiator CHAP secret settings should be configured.

6 Click *Close*.

Configuring access restrictions for the entire TeraStation is finished.

Connecting Volumes on the Access-Restricted TeraStation

Using Microsoft iSCSI Initiator

If access restrictions are configured for the entire iSCSI volume, that volume will not be detected by Microsoft iSCSI Initiator. To connect that volume, the target CHAP name and secret should be authenticated.

1 Open the Microsoft iSCSI Initiator.

2 Register the initiator CHAP secret to your computer first. If you didn't enable mutual authentication, skip this step.

Click *CHAP* in the "Configuration" tab. In the "Initiator CHAP secret" field, enter the configured initiator CHAP secret and click *OK*.

3 In the "Discovery" tab, click *Discover Portal*.

4 Enter the TeraStation's IP address in the "IP address or DNS name" field.

5 Click *Advanced*.

6 Select the "Enable CHAP log on" checkbox and enter the target CHAP name into the "Name" field and the target CHAP secret into the "Target secret" field.

If mutual authentication is enabled, select the "Perform mutual authentication" checkbox.

7 Click *OK* twice.

8 From the "Targets" tab, select the volume from "Discovered targets" and click *Connect* - *OK*.

9 If the status of the selected volume is displayed as "Connected" under "Discovered targets", the connection is established properly.

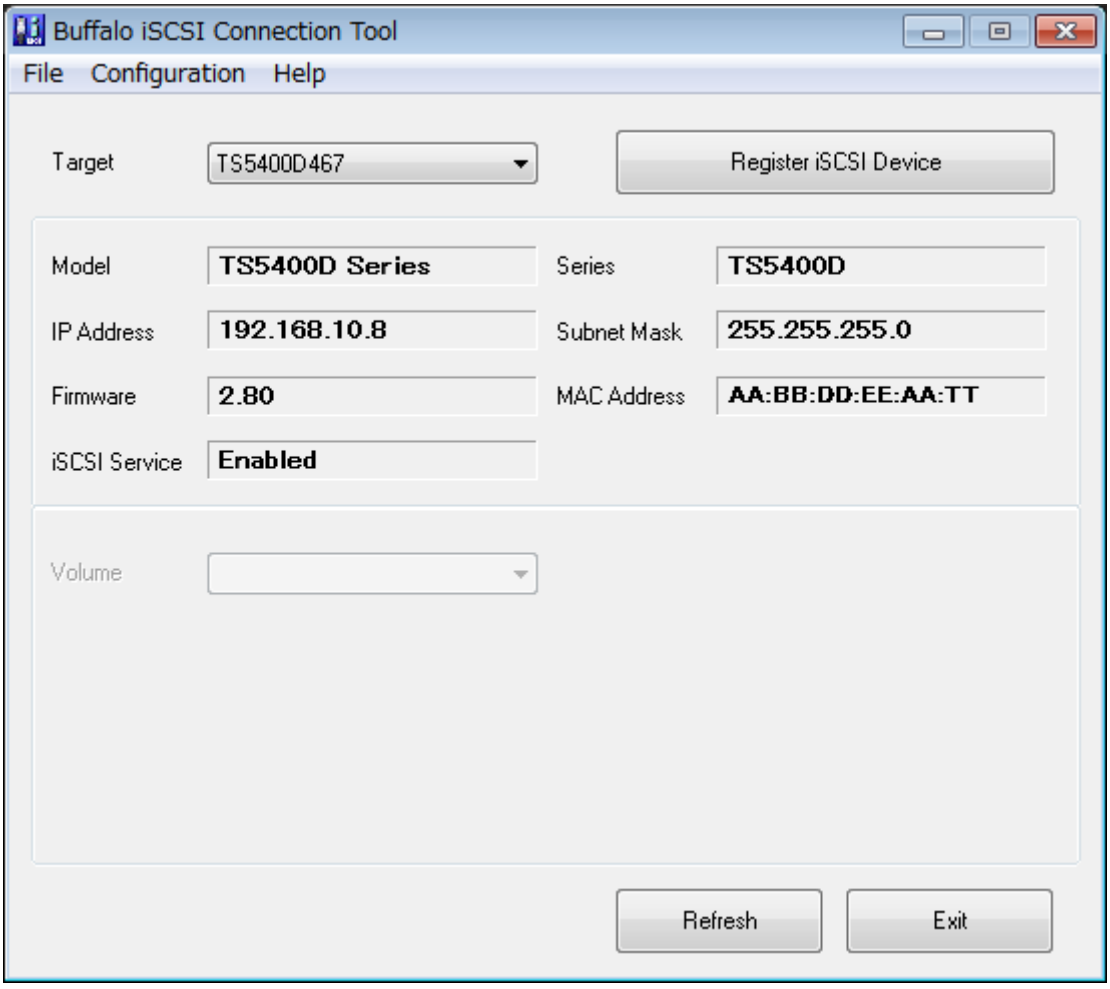
Accessing the volume on the access-restricted TeraStation is finished.

Using Buffalo iSCSI Connection Tool

Note: This section uses the TS5400D as an example; the procedure below can be used with other TeraStation models as well.

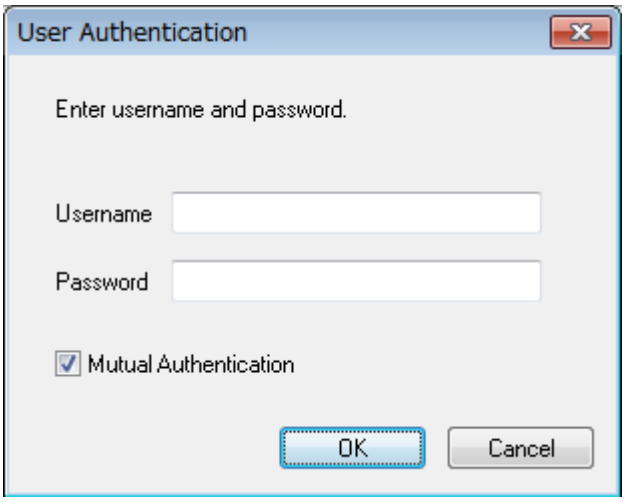
1 Open the Buffalo iSCSI Connection Tool.

2 Select the TeraStation name from the drop-down list of "Target" and click *Register iSCSI Device*.

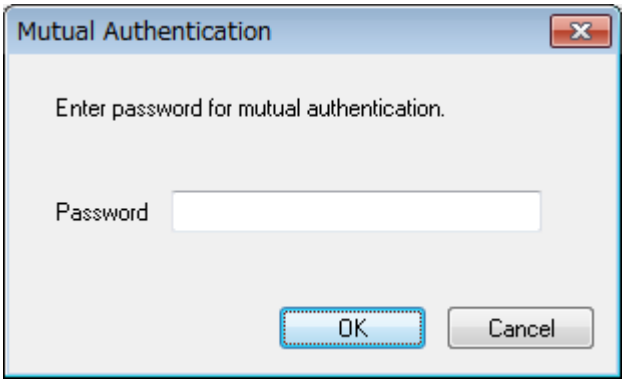


3 The screen to enter the username and password will be displayed. Enter the target CHAP name into the "Username" field and the target CHAP secret into the "Password" field, and click *OK*.

If mutual authentication is enabled, select the "Mutual Authentication" checkbox, then click *OK*.

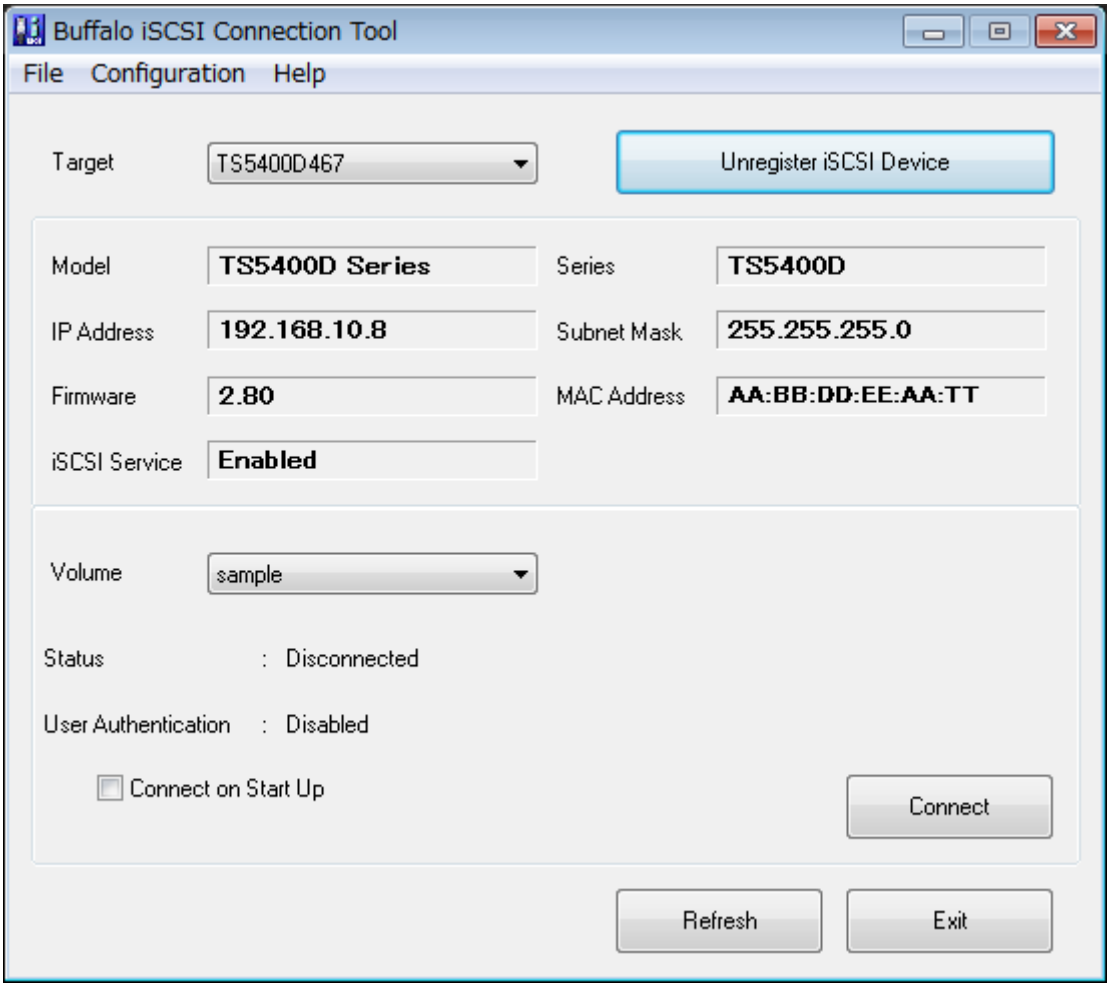


4 If "Mutual Authentication" is checked, the following screen will be displayed. Enter the initiator CHAP secret and click *OK*.



5 When authentication is successful, click *OK*.

6 Select a volume to connect from the drop-down list of "Volume" and click *Connect*.



7 Click *OK*.

Accessing the volume on the access-restricted TeraStation is finished.

Configuring Access Restrictions for Individual Volumes

If access restrictions are configured for a volume, that volume cannot be accessed unless the target CHAP name and secret are authenticated.

1 In Settings, click *Drives*.

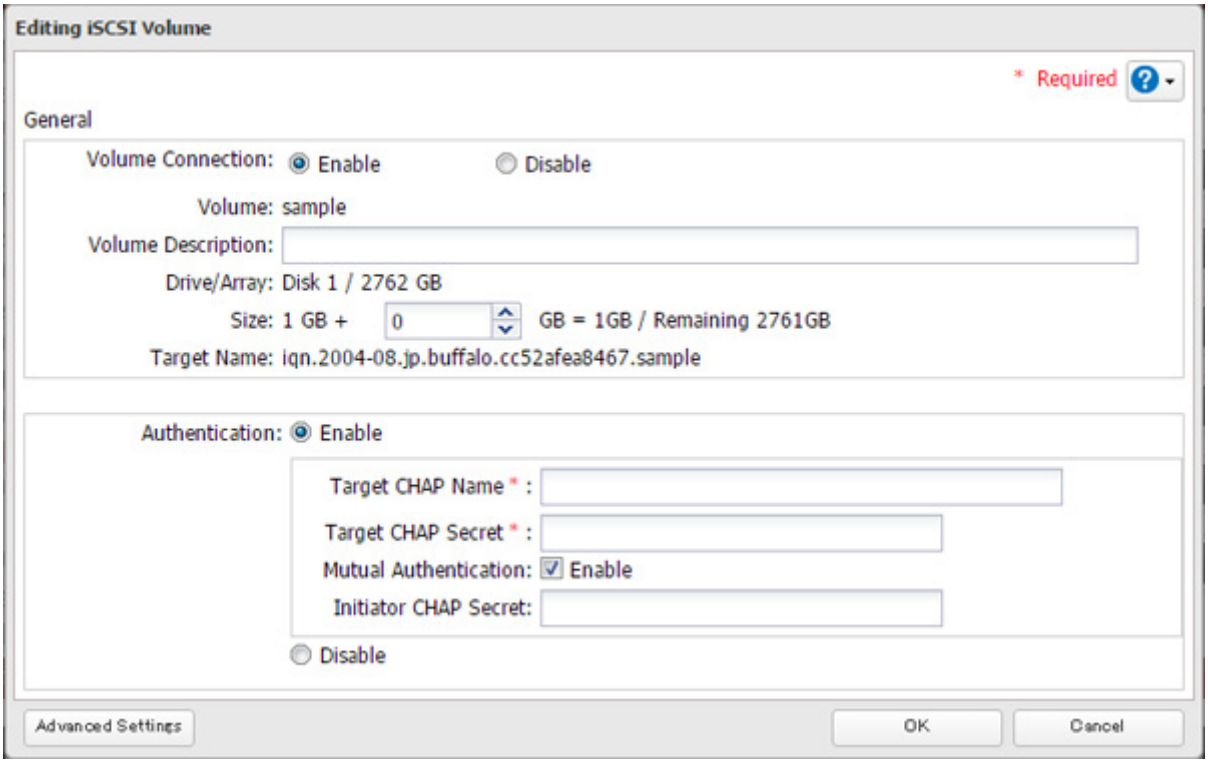


2 Click  to the right of "iSCSI".



3 Click the volume to enable access restrictions.

4 Enable authentication, enter a target CHAP name and secret, and click *OK*.



Note: To enable mutual authentication, select the "Enable" checkbox to the right of "Mutual Authentication" and enter the initiator CHAP secret.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

6 Click *OK*, then *Close*.

Configuring access restrictions for each iSCSI volume is finished.

Connecting to Individual Volumes that Are Access-Restricted

Using Microsoft iSCSI Initiator

1 Open the Microsoft iSCSI Initiator.

2 Register the initiator CHAP secret to your computer first. If you didn't enable mutual authentication, skip this step.

Click *CHAP* in the "Configuration" tab. In the "Initiator CHAP secret" field, enter the configured initiator CHAP secret and click *OK*.

3 In the "Discovery" tab, click *Discover Portal*.

4 Enter the TeraStation's IP address in the "IP address or DNS name" field.

5 Click *Advanced*.

6 Select the "Enable CHAP log on" checkbox and enter the target CHAP name into the "Name" field and the target CHAP secret into the "Target secret" field.

If mutual authentication is enabled, select the "Perform mutual authentication" checkbox.

7 Click *OK* twice.

8 From the "Targets" tab, select the volume from "Discovered targets" and click *Connect*.

9 Click *Advanced*.

10 Select the "Enable CHAP log on" checkbox and enter the target CHAP name into the "Name" field and the target CHAP secret into the "Target secret" field.

If mutual authentication is enabled, select the "Perform mutual authentication" checkbox.

11 Click *OK* twice.

12 If the status of the selected volume is displayed as "Connected" under "Discovered targets", the connection is established properly.

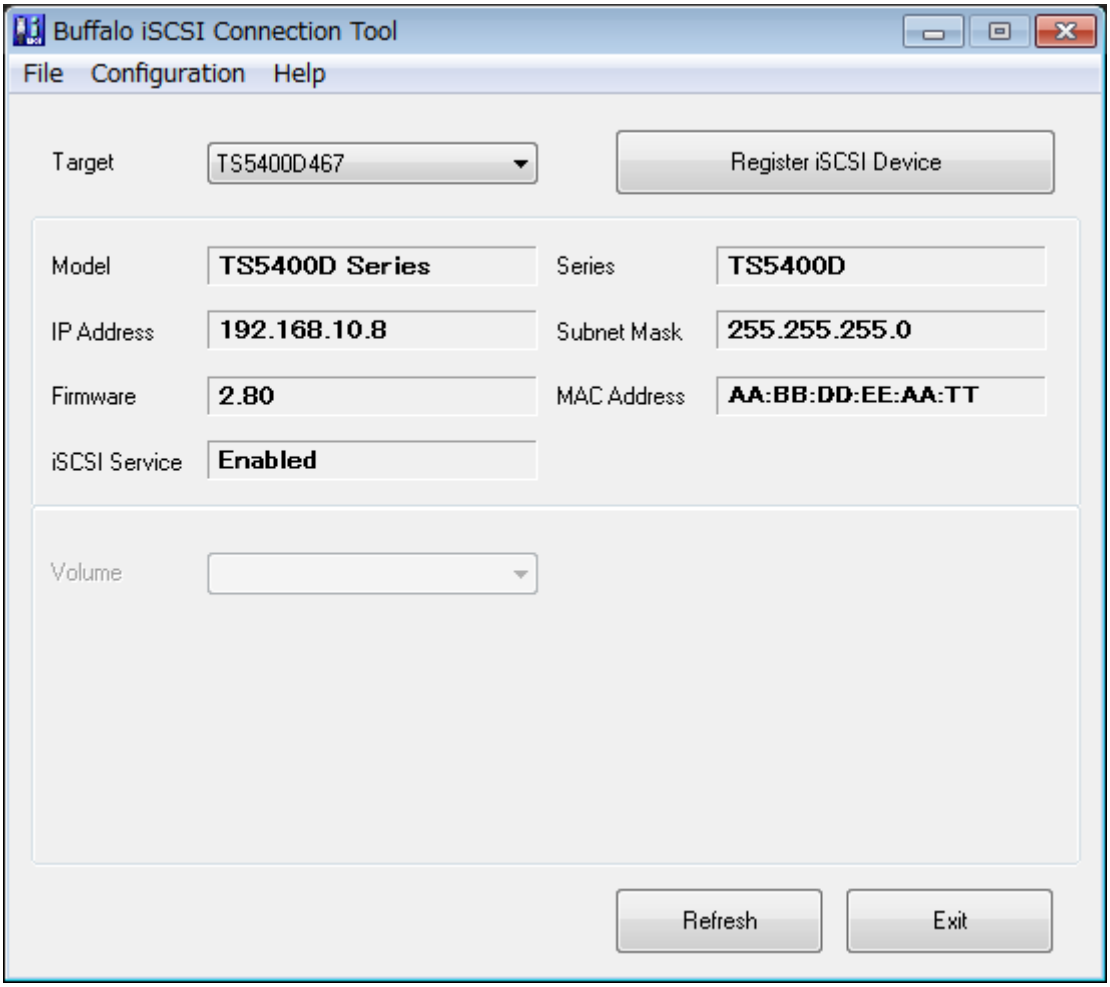
Accessing the access-restricted volume is finished.

Using Buffalo iSCSI Connection Tool

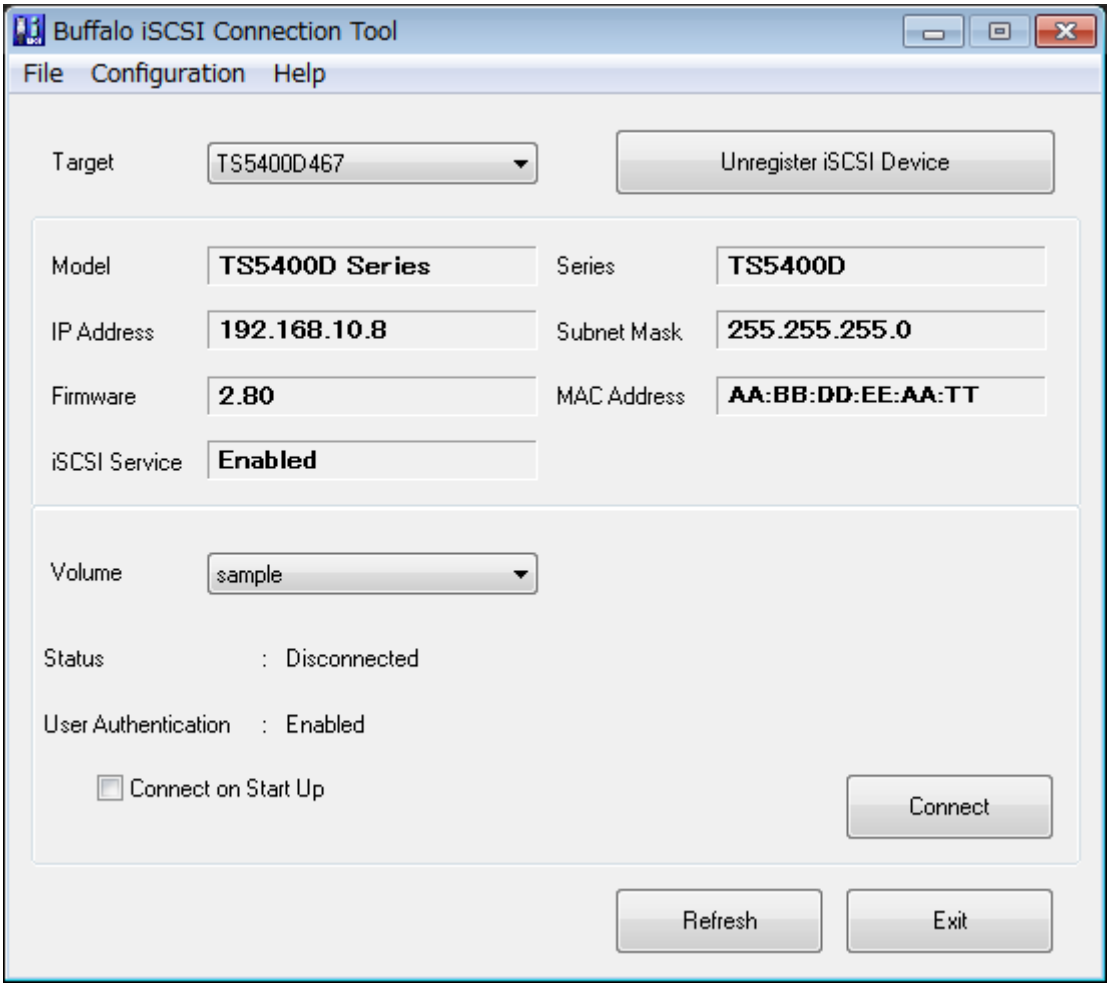
Note: This section uses the TS5400D as an example; the procedure below can be used with other TeraStation models as well.

1 Open the Buffalo iSCSI Connection Tool.

2 Select the TeraStation name from the drop-down list of "Target" and click *Register iSCSI Device*.



3 Select a volume to connect from the drop-down list of "Volume" and click *Connect*.



4 The screen to enter the username and password will be displayed. Enter the target CHAP name into the "Username" field and the target CHAP secret into the "Password" field, and click *OK*.

If mutual authentication is enabled, select the "Mutual Authentication" checkbox, then click *OK*.



5 If "Mutual Authentication" is checked, the following screen will be displayed. Enter the initiator CHAP secret and click *OK*.



6 When authentication is successful, click *OK*.

Accessing the access-restricted volume is finished.

Expanding Volume Sizes

The volume size of the existing volumes can be expanded after they are created.

Notes:

- Expanding the volume size may erase all data on the volume depending on the formatting type. Backing up the data before expanding the volume size is recommended.
- To expand the volume size, the volume should be created in the LVM-enabled drive or array.

1 In Settings, click *Drives*.

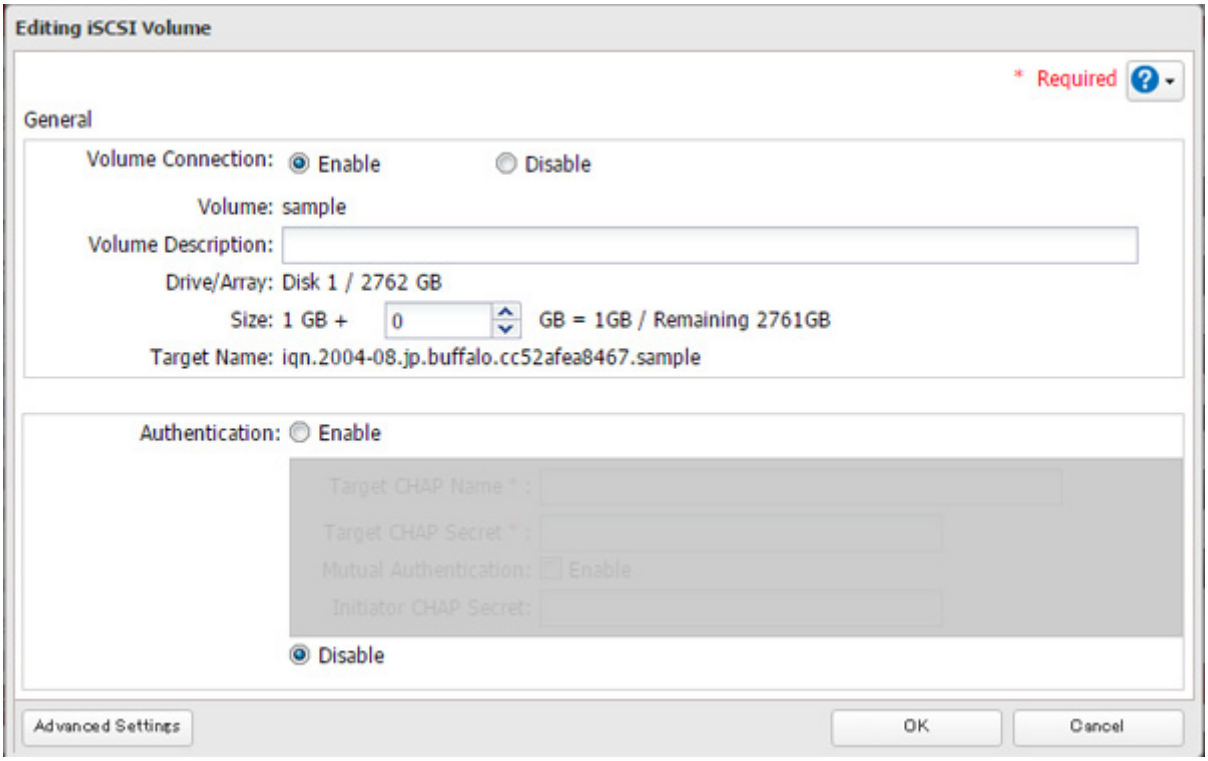


2 Click  to the right of "iSCSI".



3 Select the volume to expand.

4 Enter the desired volume size to add and click *OK*.



5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

6 Click *OK*, then *Close*.

Expanding the volume size is finished.

Deleting Volumes

To delete an existing volume, follow the procedure below.

Note: Deleting a volume will erase all data on the volume. Back up the data before deleting the volume.

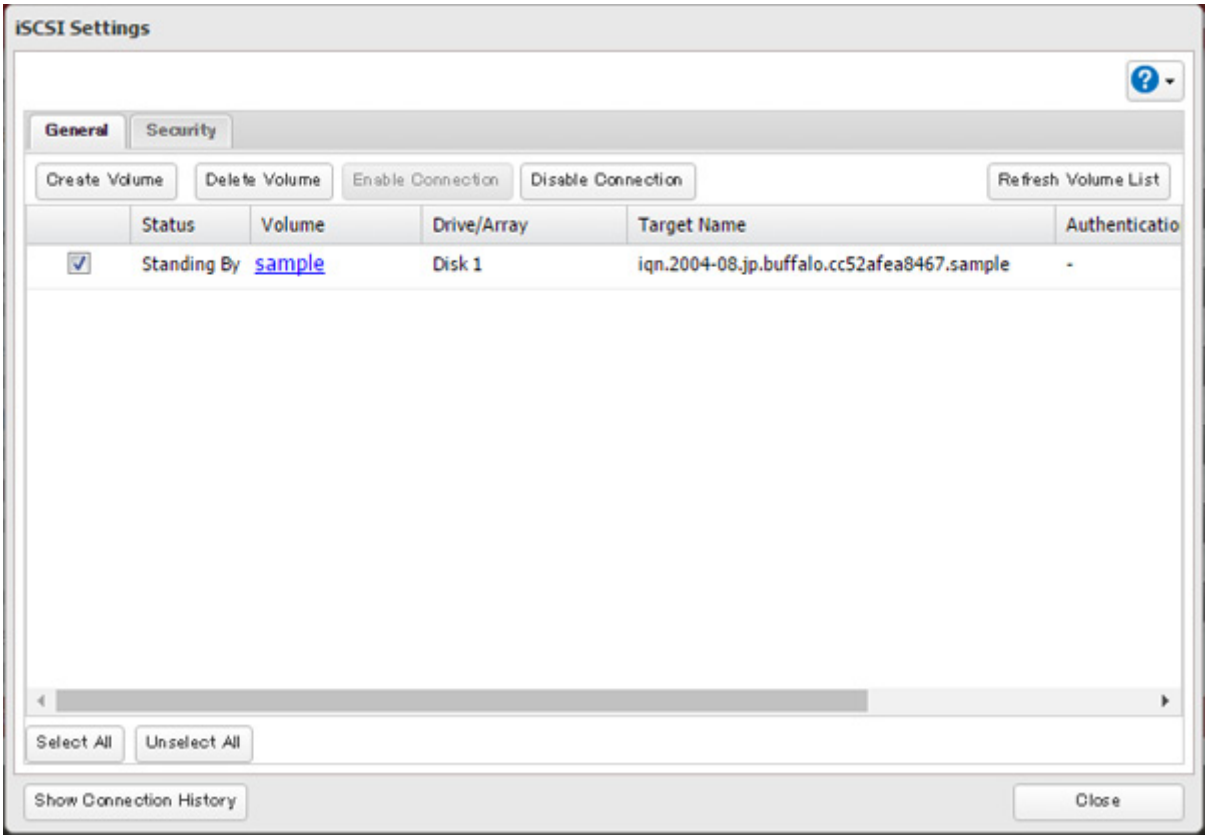
1 In Settings, click *Drives*.



2 Click  to the right of "iSCSI".



3 Select the volume to delete and click *Delete Volume*.



4 Confirm that the volume is correctly selected on the screen and click *OK*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

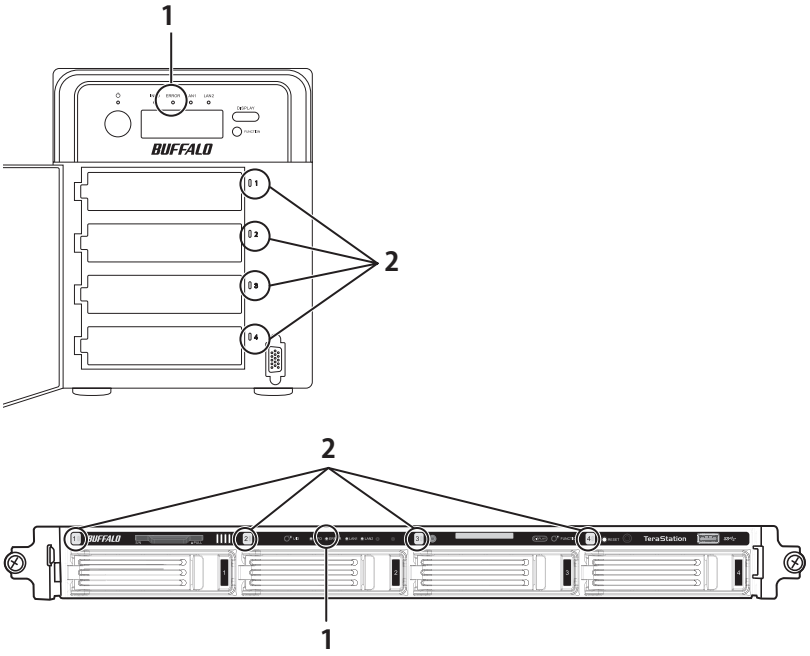
6 Click *OK*.

7 Click *Close*.

Deleting the volume is finished.

Hard Drive Replacement

Hard drives in the TeraStation show a blue status LED during normal operation. If a drive fails, its error LED will glow red.



1 Error LED

Glows red if a drive has failed.

2 Status LEDs

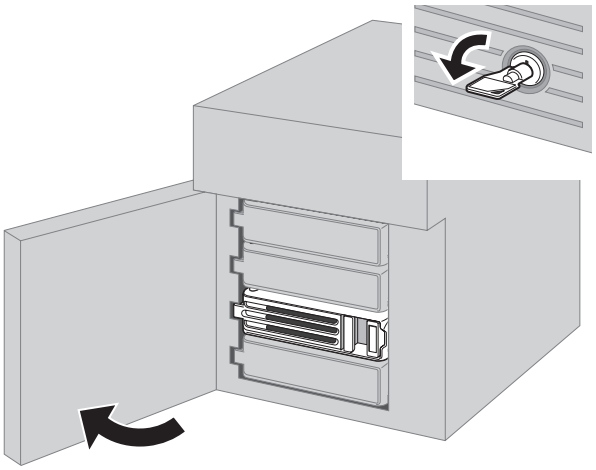
The failed drive's status LED will be glowing a steady red. A drive with a red status LED is ready to hot-swap.

Notes:

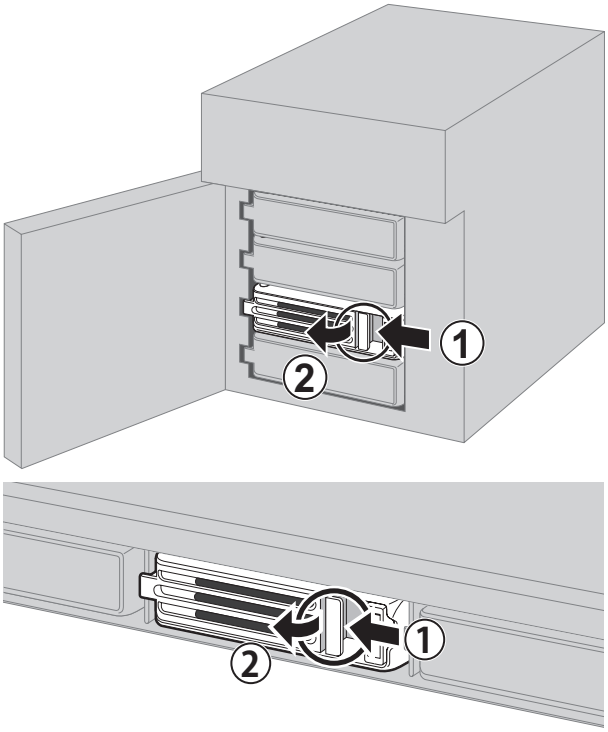
- Do not unplug a drive whose status LED is green instead of red. Dismount it first or shut down the TeraStation before swapping a working drive. If you remove the drive without properly dismounting it, data may be lost or the TeraStation may malfunction.
- For the replacement drive, use a Buffalo OP-HDWR series drive for TeraStation 5000WR series and TeraStation 5000N series, a OP-HDH series drive for the TS5400RH, and a OP-HDS series drive for other TeraStation 5000 series. The new drive should be the same size or larger. If a larger drive is used, the extra space will not be usable in a RAID array.
- To avoid damaging the TeraStation with static electricity, ground yourself by touching something made of metal before handling any sensitive electronic parts.
- After a drive is replaced, it will take about 30 minutes before normal file reading and writing are restored. Settings may not be accessible during this period.
- Do not change the order of the hard drives in the TeraStation. For example, pulling out drive 1 and replacing it with drive 2 may cause data to be corrupted or lost.
- If the LCD panel does not change after a new drive is installed, click *Rediscover Disk* in Settings.

Using JBOD or a Redundant RAID Mode and TeraStation Is On

1 Open the front cover with the included key.

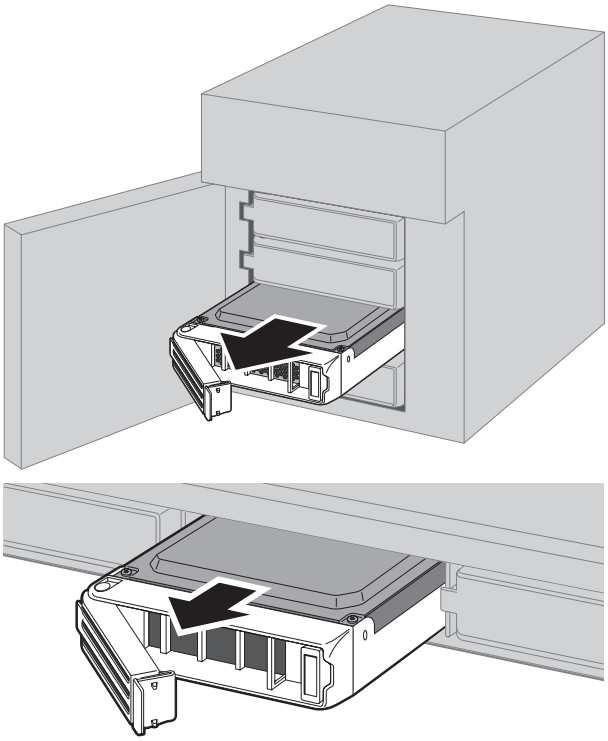


2 The failed drive's status LED will be glowing red. Push its unlock button and swing the lock mechanism out.

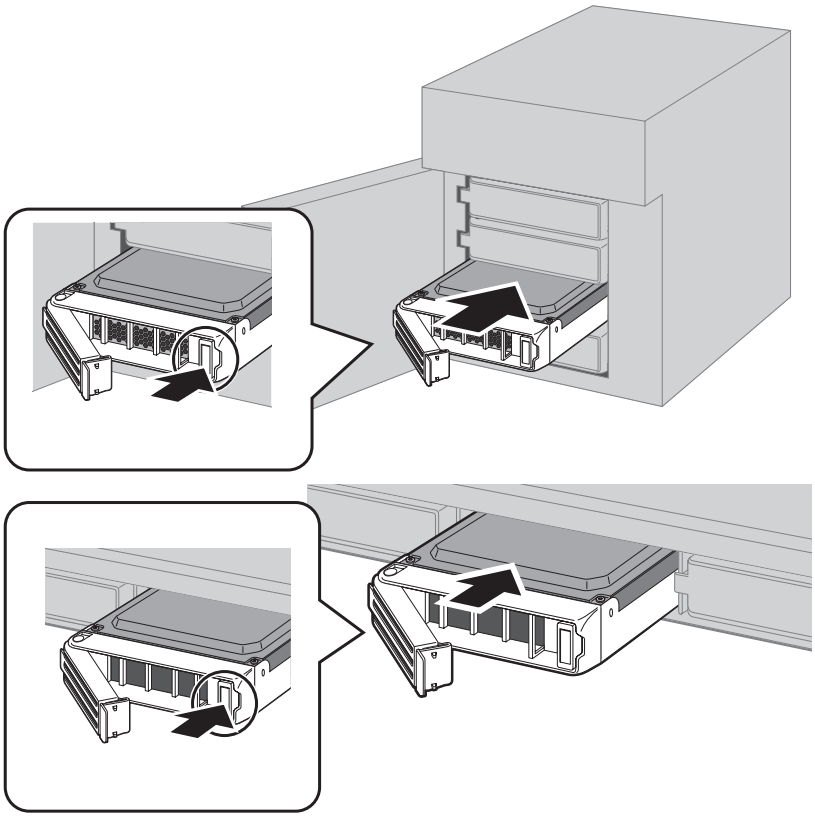


Hard drives without red status LEDs lit are still on. Do not unplug or remove them.

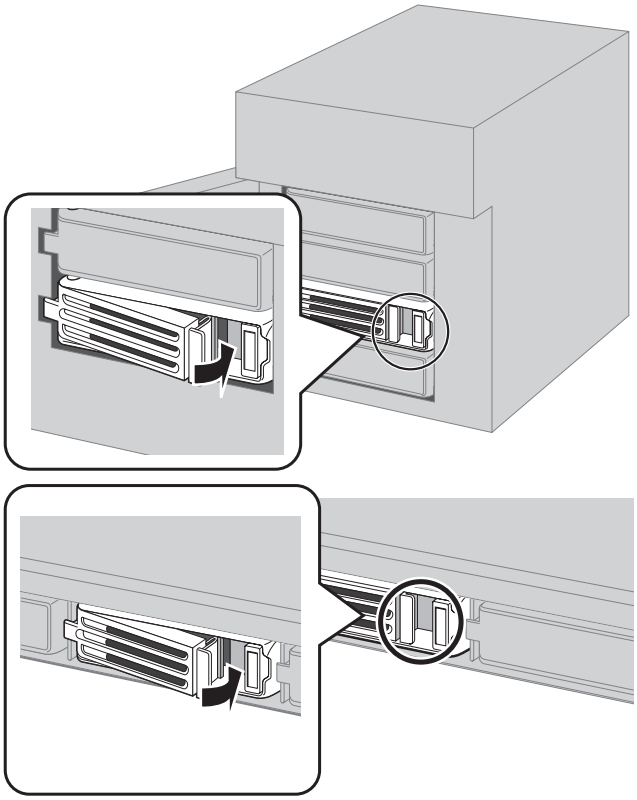
3 Pull out the drive cartridge and remove it from the TeraStation.



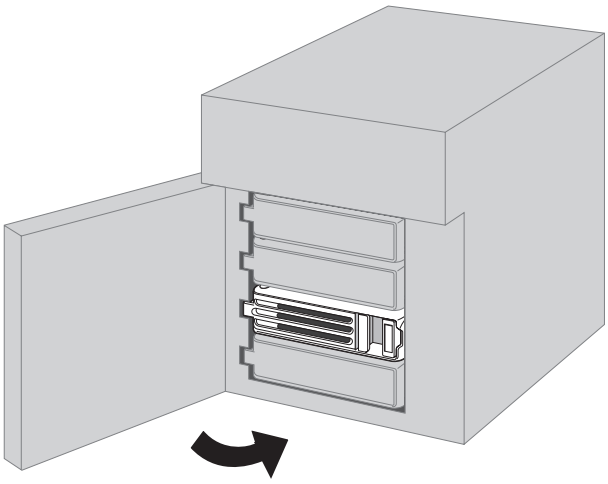
4 Insert the new drive into the empty slot. Slide the drive in with the locking mechanism open.



5 Swing the lock back down until it clicks into place.



6 Close the front cover.



7 When the replacement hard drive is recognized, the status LED will flash red and the I31 message will be displayed on the LCD panel.

8 Hold down the function button on the front of the TeraStation for 3 seconds until it beeps.

9 **For RAID 1, 5, or 6:**

The TeraStation will start rebuilding the RAID array automatically. After a few minutes, the I18 message will be displayed until the array is rebuilt.

For RAID 51 or RAID 61:

The TeraStation will start rebuilding the RAID array automatically. After a few minutes, the I18 message will be displayed until the array is rebuilt.

If 3 or more drives were replaced in a RAID 51 array, or if 4 or more drives were replaced in a RAID 61 array, wait 10 minutes after I18 appears and navigate to *Drives - RAID* in Settings. Select the RAID array and check if

"Recover RAID Array" button is displayed. If so, select the drives that were not included in the RAID array and click *Recover RAID Array*.

For JBOD:

The drive will be formatted as an individual drive. Create a shared folder on the drive before use.

Using a Redundant RAID Mode and TeraStation Is Off

1 Open the front cover with the key.

2 The failed drive's status LED will be glowing red. Push its unlock button and swing the lock mechanism out.

3 Pull out the drive cartridge and remove it from the TeraStation.

4 Insert the new hard drive into the empty slot. Slide the drive in with the locking mechanism open. Swing the lock back down until it clicks into place.

5 Close the front cover.

6 Press the power button on the TeraStation.

7 When the replacement hard drive is recognized, the status LED will flash red and the I31 information message will be displayed on the LCD panel.

8 Hold down the function button on the front of the TeraStation for 3 seconds until it beeps. The TeraStation will start rebuilding the RAID array automatically. It will take about 5 minutes before the I18 message is displayed.

For RAID 51 or RAID 61:

The TeraStation will start rebuilding the RAID array automatically. After a few minutes, the I18 message will be displayed until the array is rebuilt.

If 3 or more drives were replaced in a RAID 51 array, or if 4 or more drives were replaced in a RAID 61 array, wait 10 minutes after I18 appears and navigate to *Drives - RAID* in Settings. Select the RAID array and check if "Recover RAID Array" button is displayed. If so, select the drives that were not included in the RAID array and click *Recover RAID Array*.

Using RAID 0

Drives in a RAID 0 array do not automatically turn off in the event of a malfunction. Before replacing the failed drive, either dismount the drive from Settings, or shut down the TeraStation.

This section describes the process of replacing a drive with the TeraStation on.

Note: If a hard drive malfunctions in RAID 0, all data on the RAID array will be lost. All of the settings for the shared folders (such as access restrictions) are erased after replacing a drive from a RAID 0 array.

1 Open the front cover with the included key.

2 In Settings, navigate to *Drives - Drives*.

3 Select the hard drive with the flashing status LED and click *Dismount Disk*.

4 Enter the number that appears on the screen, then click *OK*.

5 The status LED will stop flashing and glow steadily.

6 Unlock the failed drive by pushing the unlock button and swinging the lock mechanism out.

Note: Hard drives without red status LEDs lit are still on. Do not unplug or remove them.

7 Pull out the hard drive cartridge and remove it from the TeraStation.

8 Insert the new hard drive (sold separately) into the empty slot. Slide the drive in with the locking mechanism open. Swing the lock back down until it clicks into place.

9 Close the front cover.

10 When the replacement drive is recognized, the status LED will flash red and the I32 information message will be displayed on the LCD panel.

Select the RAID array from *Drives - RAID* in Settings and click *Delete RAID Array*. In *Drives - Drives*, click *Format Disk* to format the new drive. In *Drives - RAID*, choose the type of RAID array desired. Enter the confirmation number and click *OK*. Create a shared folder before use.

Using a Hot Spare

If your TeraStation's drives are in a redundant RAID mode, and you have a hot spare enabled, a malfunctioning drive in the array is replaced by the spare drive and the RAID array is rebuilt automatically. The status LED will continue to glow red for the failed drive even after the RAID array is rebuilt with the hot spare. This section describes the replacement process for a hard drive while the TeraStation is still on.

1 Open the front cover with the included key.

2 The failed drive's status LED will be glowing red. Push its unlock button and swing the lock mechanism out.

3 Pull out the drive cartridge and remove it from the TeraStation.

4 Insert the new drive into the empty slot. Slide the drive in with the locking mechanism open. Swing the lock back down until it clicks into place.

5 Close the front cover.

6 When the replacement drive is recognized, the status LED will flash red and the I31 information message will be displayed on the LCD panel.

7 Hold down the function button on the front of the TeraStation for 3 seconds until it beeps. The replacement hard drive is automatically registered as a hot spare.

To use the replacement disk as a normal drive rather than a hot spare, navigate to *Drives - RAID* and click the RAID array, select the new drive, and click *Set as a normal disk*.

Note: If a drive fails in the RAID array before it is rebooted, the hot spare will not automatically replace the failed drive. In this case, follow the procedure below to repair the array.

(1) In Settings, navigate to *Drives - Drives*.

(2) Click the drive that was configured as a hot spare, then click *Dismount Disk*.

(3) Click *Rediscover Disk*.

(4) Navigate to *Drives - RAID*.

(5) Choose the RAID array to repair.

(6) Click the drive that was previously configured as a hot spare, then click *Recover RAID Array*.

This will rebuild the RAID array.

Replacing a Media Cartridge

Drives configured as media cartridges may be removed and moved to a different TeraStation for use. Before unplugging the drive, dismount it in Settings or shut down the TeraStation.

Replacing a Non-Malfunctioning Hard Drive

Do not replace a hard drive that is not malfunctioning (unless it has been converted to a media cartridge).
If you must change a drive that is not malfunctioning, either first dismount it in Settings, referring to the "Dismounting Drives" section above, or shut down the TeraStation before replacing the drive. If you need to replace more than one drive at the same time, replace the drives one at a time to preserve your data. When replacing the non-malfunctioning drive, the RAID array will function as below:

Operating in RAID 0 Mode

All data on the RAID array will be deleted after replacing the drive. You will not be able to use the TeraStation until you delete and rebuild the RAID array with the new drive.

Operating in JBOD

All data on that hard drive will be deleted after replacing the drive. You will not be able to use the TeraStation until you format the new drive.

Operating in a Redundant RAID Mode

If you are using a redundant RAID mode such as RAID 1, 5, or 6, the RAID array will be in degraded mode after replacing the drive. You will not be able to use the TeraStation until you rebuild the RAID array with the new drive.

Chapter 5 Backup

Backing Up from the TeraStation

You can back up TeraStation folders to:

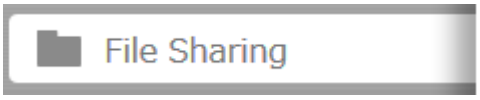
- A different folder on the TeraStation
- Another LinkStation on the network
- Another TeraStation on the network

You can also configure backup jobs from Easy Admin.

Preparing a Backup Destination

First, configure a folder as a backup destination.

1 In Settings, click *File Sharing*.



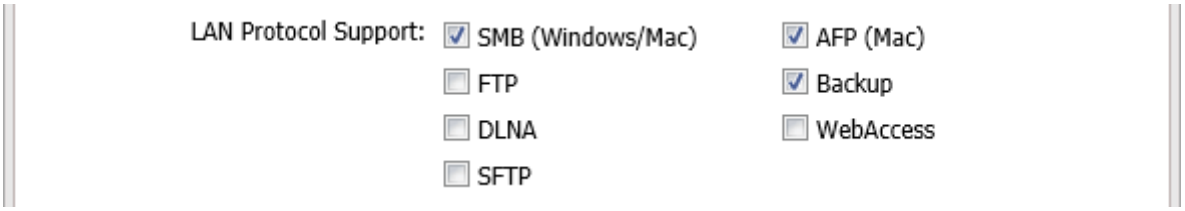
2 Click  to the right of "Folder Setup".



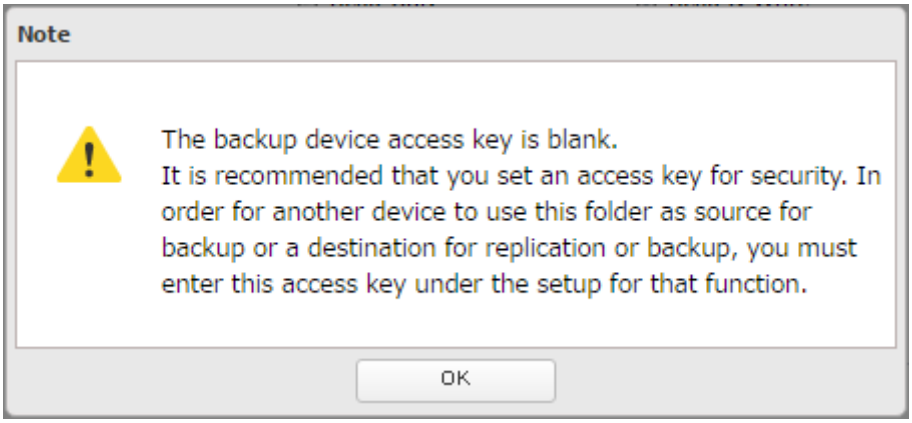
3 Choose the folder to set as a backup destination.

4 Click *Edit*.

5 Under "LAN Protocol Support", select the "Backup" checkbox.



6 Click *OK*.



7 Enter the desired characters into the backup device access key field and click *OK*.



Note: You may leave this field blank if you do not want a backup device access key, but for security reasons we highly recommend entering one for the shared folder. If a backup device access key is configured for the shared folder, that folder will not show up as a target for the backup source or destination when configuring a backup job on another Buffalo NAS device unless it's entered. You may create multiple folders using different backup device access keys for backup and replication, but only one access key can be used on the TeraStation. Folders that are configured with a different access key cannot be used.

8 Click *OK*.

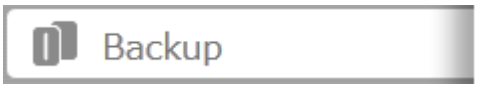
Notes:

- To back up data between Buffalo NAS devices on a network using jumbo frames, make sure that both devices are configured to use identical (or similar) Ethernet frame sizes. If Ethernet frame sizes are significantly different, the backup job may not be properly performed. In such a case, select the default frame size (1500 bytes).
- You can also specify a hostname by a fully qualified domain name (FQDN).
- Windows-based TeraStations with multibyte characters in the hostname may not be detected as a backup destination, and folders in these devices cannot be used as backup destination folders.

Backing Up to a Buffalo NAS Device on Another Network When Connected via VPN

You can back up to a Buffalo NAS device on another network as long as the two networks are connected by a VPN. Follow this procedure to enter the IP address or hostname of the destination Buffalo NAS device.

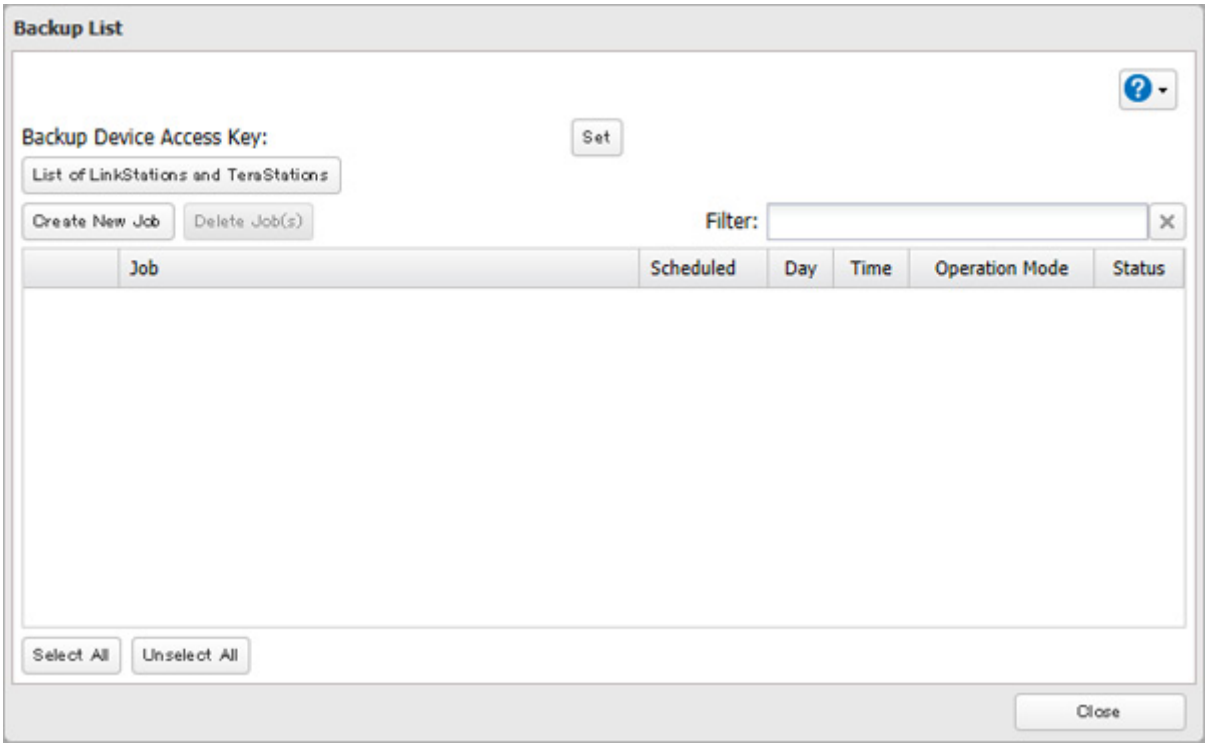
1 In Settings, click *Backup*.



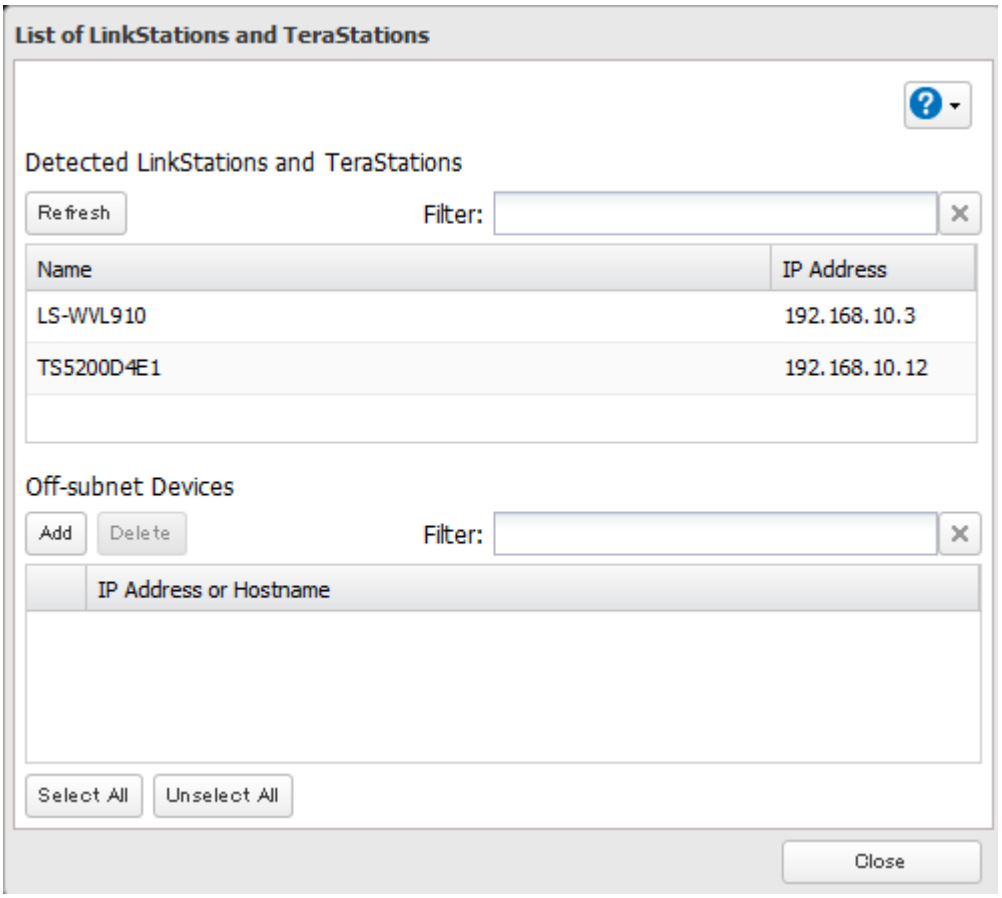
2 Click  to the right of "Backup".



3 Click *List of LinkStations and TeraStations*.



4 Click *Add* under "Off-subnet Devices", enter the IP address or hostname of the destination LinkStation or TeraStation, and click *Close*.



Configuring a Backup Job

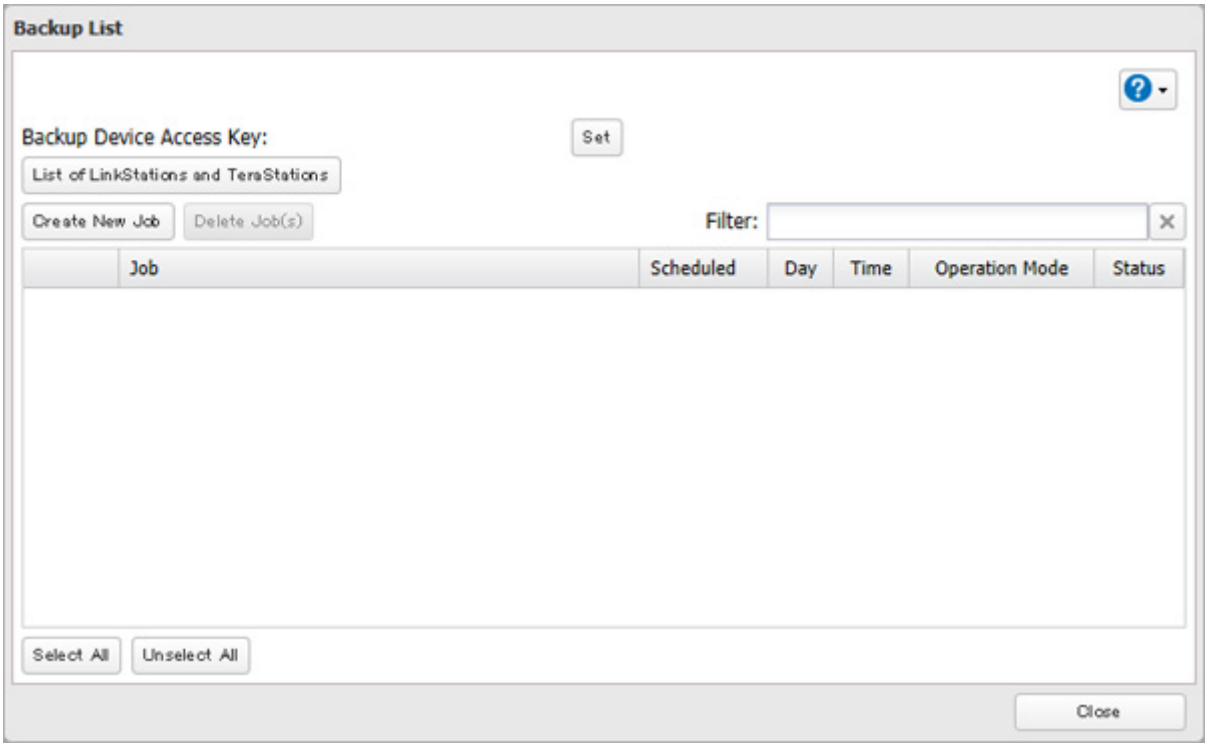
1 In Settings, click *Backup*.



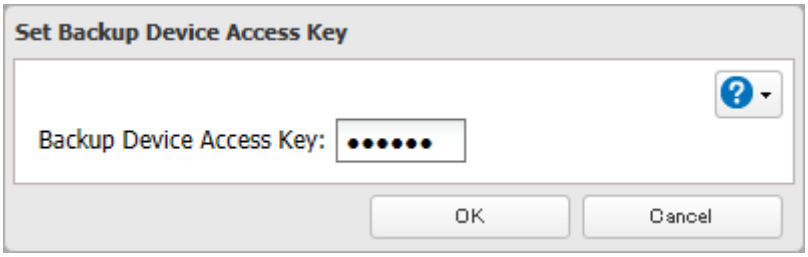
2 Click  to the right of "Backup".



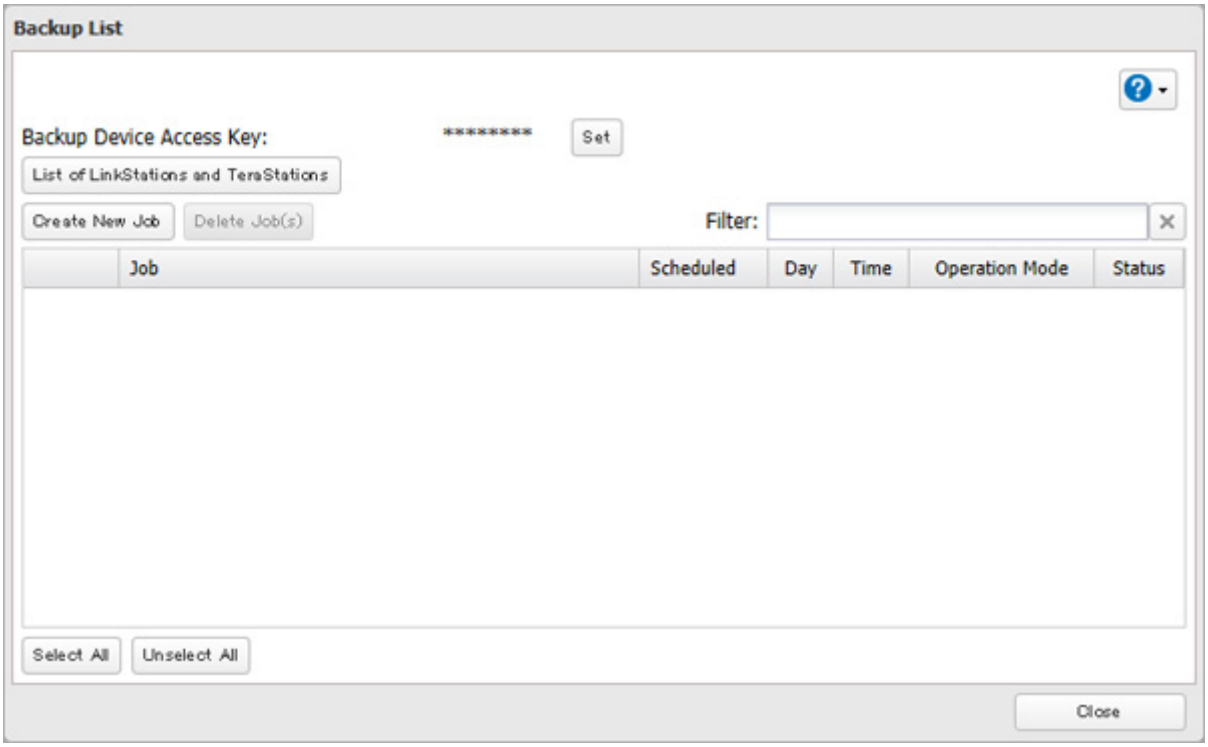
3 If you configured the backup device access key, click *Set*. If you didn't, proceed to step 5.



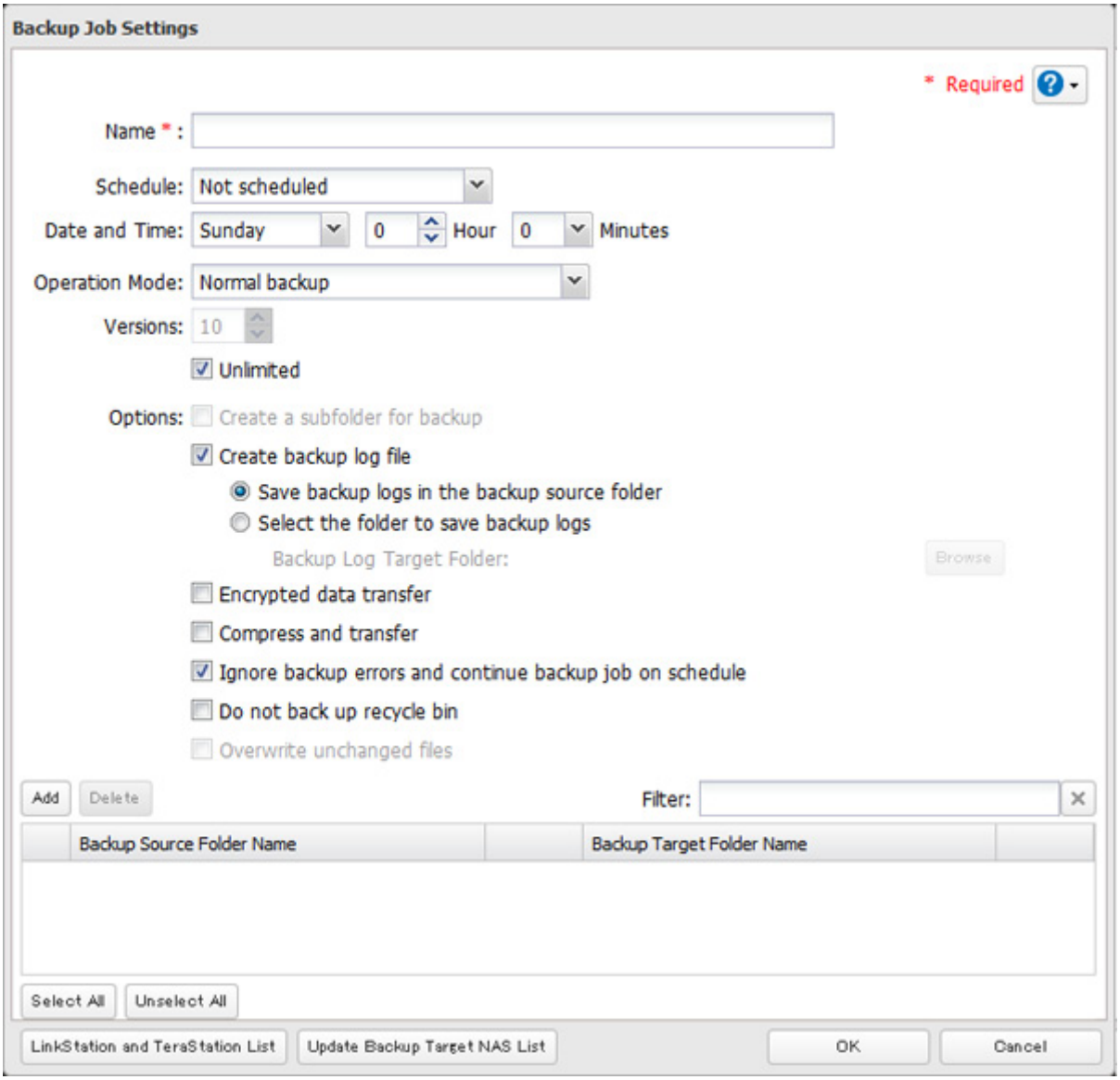
4 Enter the backup device access key and click *OK*.



5 Click *Create New Job*.



6 Select backup settings such as date and time to run.



The following types of backup jobs may be selected:

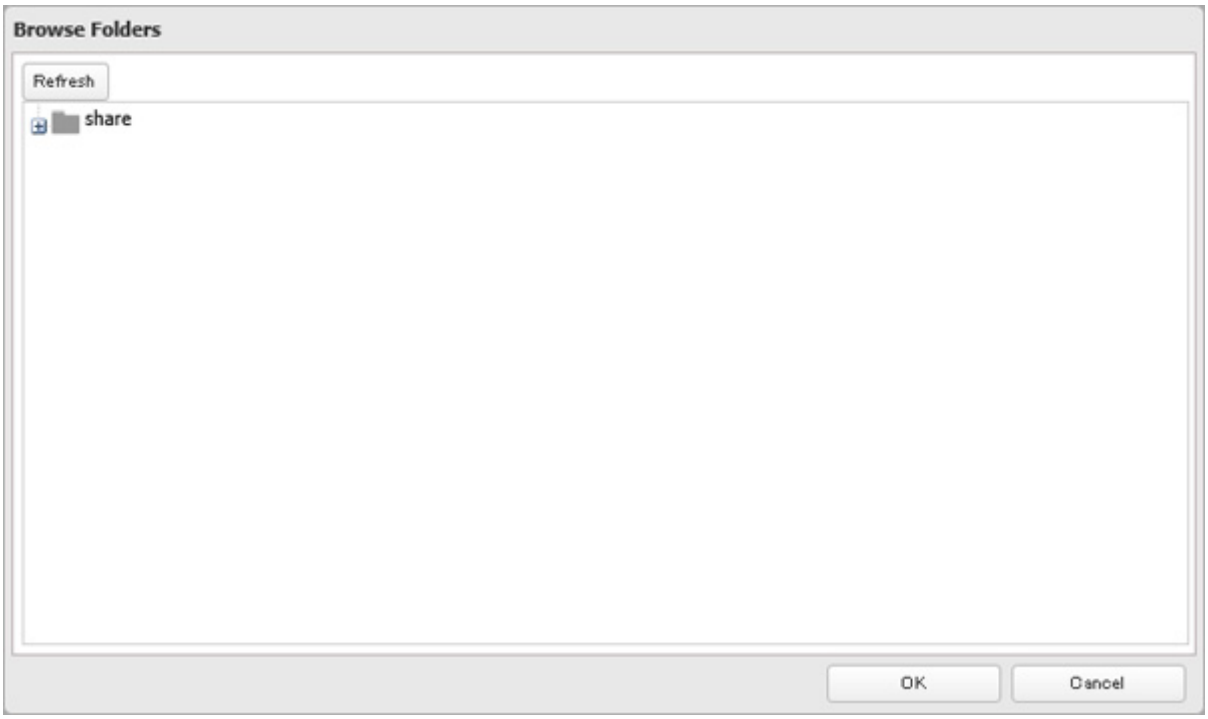
Type	Files included
Normal backup	All files in the source will be backed up to the destination. You can specify how many backup versions to keep from 1–400, or select "Unlimited" to keep all backups until the drive is full. If a specific number of backup versions is specified, the backup destination folder should be on the same TeraStation that the backup job is configured from, or on an external USB drive attached to that TeraStation.
Overwrite (incremental)	The first time the backup job runs like a normal backup. In subsequent backups, files added to the source as well as files deleted from the source are kept in the backup folder.
Overwrite (differential)	The first backup job runs like a normal backup. As each additional backup job runs, files are added to and deleted from the backup folder. The backup destination folder is always the same size as the backup source folder.

Type	Files included
Management backup	Each time a backup is executed, management information is stored, and only files that have changed are copied or deleted. Data is retrieved from the previous backup file for files that were not changed. This is useful for making backups with limited space or for referencing status at a particular point in time (for use for data snapshot applications). The destination folder for a management backup should be a local folder on this TeraStation or on a USB drive attached to it. The destination folder will be set to read-only. Do not use folders from drives formatted with FAT. You can specify how many backup versions to keep from 1–400, or select "Unlimited" to keep all backups until the drive is full. The backup destination folder should be on the same TeraStation that the backup job is configured from, or on an external USB drive attached to that TeraStation.

7 Click *Add*.

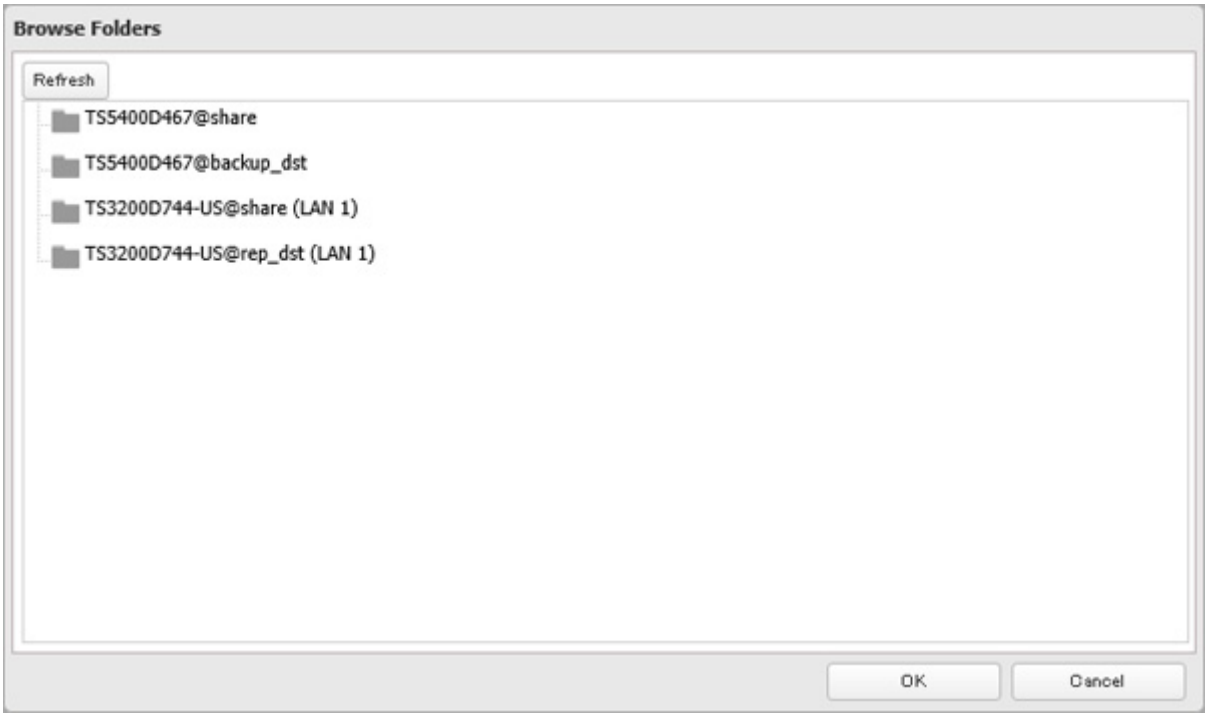
8 Click *Browse* under "Backup Source Folder Name".

9 Select the shared folder that will be the backup source, then click *OK*.



10 Click *Browse* under "Backup Target Folder Name".

11 Select the backup destination and click *OK*.



12 Click *OK*. Jobs will be added to the backup list.

Note: Up to 8 backup jobs can be configured.

Backup Logs

The following backup error codes may be recorded in the backup log. Read the description and try the respective corrective actions for each error.

Code	Description	Corrective Action	Log Example
Code 3	The backup destination USB drive could not be found.	Verify that the backup destination USB drive is connected to the TeraStation properly.	rsync error: errors selecting input/ output files, dirs (code 3) at main.c(634) [Receiver=3.1.0] Can't write to backup destination(target disk is broken?).
Code 5	The backup destination shared folder could not be found.	Verify that the Ethernet cable is securely connected and that the hub or other devices on the network are turned on.	rsync error: error starting client-server protocol (code 5) at main.c(1504)
Code 10	The Ethernet cable was disconnected from the backup source TeraStation when the backup job started.	Reconnect the Ethernet cable.	rsync error: error in socket IO (code 10) at clientserver.c(128) [sender=3.1.0pre1]
Code 11	The drive capacity of the backup destination TeraStation became full.	Delete unnecessary files and folders.	rsync error: error in file IO (code 11) at receiver.c(389) [receiver=3.1.0]

Code	Description	Corrective Action	Log Example
Code 12	Could not communicate between backup source and destination TeraStations.	Verify that the Ethernet cable is securely connected and that the hub or other devices on the network are turned on.	rsync error: error in rsync protocol data stream (code 12) at io.c(515)
	The settings of the TeraStation were changed while the backup job was running.	Do not change the settings while the backup job is running. If changed, the connection is temporarily terminated and the backup job will fail.	
Code 14 Code 22	Insufficient memory on the TeraStation was not enough so that the backup job did not run.	Reduce the number of backup destination files or disable any other functions running at the same time.	ERROR: out of memory in flist_ expand rsync error: error allocating core memory buffers (code 22) at util.c(120) [sender=2.6.8] rsync: fork failed in do_recv: Cannot allocate memory (12) rsync error: error in IPC code (code 14) at main.c(655) [receiver=2.6.8]
Code 20	The connection was disconnected while the backup job was running.	Do not change the settings while the backup job is running. If changed, the connection is temporarily terminated and the backup job will fail.	rsync error: received SIGINT, SIGTERM, or SIGHUP (code 20) at rsync.c(242)
Code 23	Invalid characters were used in the filename or folder name of the backup destinations.	Change the filename or folder name using compatible characters. Available characters are described in the "Adding a Shared Folder" section in chapter 3.	rsync error: some files could not be transferred (code 23) at main.c(702)
	The backup destination files were updated while the backup job was running.	Do not overwrite the backup destination files while the backup job is running. If updated, the backup destination files will not be backed up and the backup job will fail.	

Code	Description	Corrective Action	Log Example
Code 23	4 GB or more files were backed up to the FAT32-formatted USB drive.	Reduce the file size to 4 GB or less or change the file system to one other than FAT32. Refer to the "Adding an External Hard Drive" section in chapter 4 for the compatible file systems.	rsync error: some files could not be transferred (code 23) at main.c(702)
	The TeraStation backed up the data to the FAT32-formatted USB drive, then the upper- or lowercases of filename and folder name on the backup source TeraStation were changed.	Do not change the upper- or lowercase of filenames and folder names on the backup source TeraStation if the backup destination USB drive is formatted to FAT32. Linux on the TeraStation is case-sensitive but FAT isn't, so the same filename and folder name that only differs in upper- or lowercase will not be identified and treated as the same file or folder. To back up properly, using XFS or ext3 is recommended.	
Code 24	The backup destination files were updated while the backup job was running.	Do not overwrite the backup destination files while the backup job is running. If updated, the backup destination files will not be backed up and the backup job will fail.	rsync warning: some files vanished before they could be transferred (code 24) at main.c
Code 30	The Ethernet cable was disconnected from the backup source or destination TeraStations while the backup job was running.	Reconnect the Ethernet cable.	rsync error: timeout in data send/receive (code 30) at io.c(195) [sender=3.1.0]
B14	Insufficient TeraStation memory.	Restart the TeraStation and try again.	-
B101	The backup destination TeraStation does not exist.	Verify that the backup destination TeraStation is turned on, the Ethernet cables are securely connected, and the hostname of the backup destination TeraStation is not changed.	-
B102		Verify that the backup destination folders on the backup destination TeraStation exist in the shared folder list and the backup destination folders are configured for backup from Settings.	-
B103	The backup source folders on the backup source TeraStation do not exist.	Verify that the backup source folders on the backup source TeraStation exist in the shared folder list.	-
B105	The drives were not recognized.	Verify that the drives are recognized properly from Settings. If you configure the "mediacartridge" or "usbdisk" folders for the backup source or destinations, confirm if these folders exist in the shared folder list.	-

Code	Description	Corrective Action	Log Example
B106	The file systems of the media cartridge and USB drive are not supported.	Verify that the media cartridge and USB drive are formatted to the compatible file systems. If you configure the management backup in the backup job, FAT format cannot be used for the backup destination.	-
B107	The device files such as "/dev/null" etc. does not exist.	Restart the TeraStation and try again.	-

Replication

Replication copies all data from a share to a share on a different TeraStation. This is an easy way to configure a reliable system to provide data protection in the event your main TeraStation fails. To configure replication, connect an Ethernet cable to the LAN port of each TeraStation and follow the procedure below.

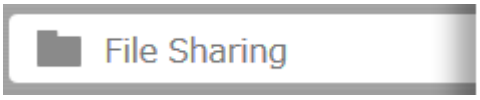
Notes:

- For best results, use static IP addresses for connecting both replication TeraStations (source and destination).
- Replication source data is copied to the replication destination folder with a differential overwrite. Any data that is not in the replication source will be overwritten.

Preparing a Replication Destination

First, configure a folder as a replication destination.

1 In Settings, click *File Sharing*.



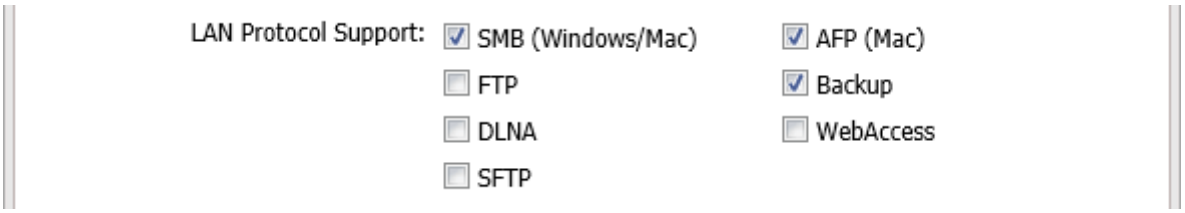
2 Click  to the right of "Folder Setup".



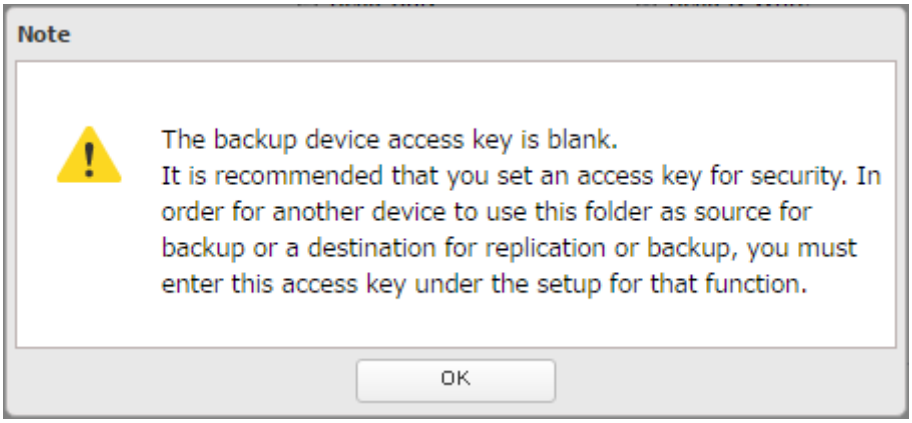
3 Choose the folder to set as a replication destination.

4 Click *Edit*.

5 Under "LAN Protocol Support", select the "Backup" checkbox.



6 Click *OK*.



7 Enter the desired characters into the backup device access key field and click *OK*.



Note: You may leave this field blank if you do not want a backup device access key, but for security reasons we highly recommended entering one for the shared folder. If a backup device access key is configured for the shared folder, that folder will not show up as the replication destination when configuring a replication task on another Buffalo NAS device unless it's entered. You may create multiple folders using backup device access keys for backup and replication, but only one access key can be used on the TeraStation. Folders that are configured with a different access key cannot be used.

8 Click *OK*.

Configuring a Replication Task

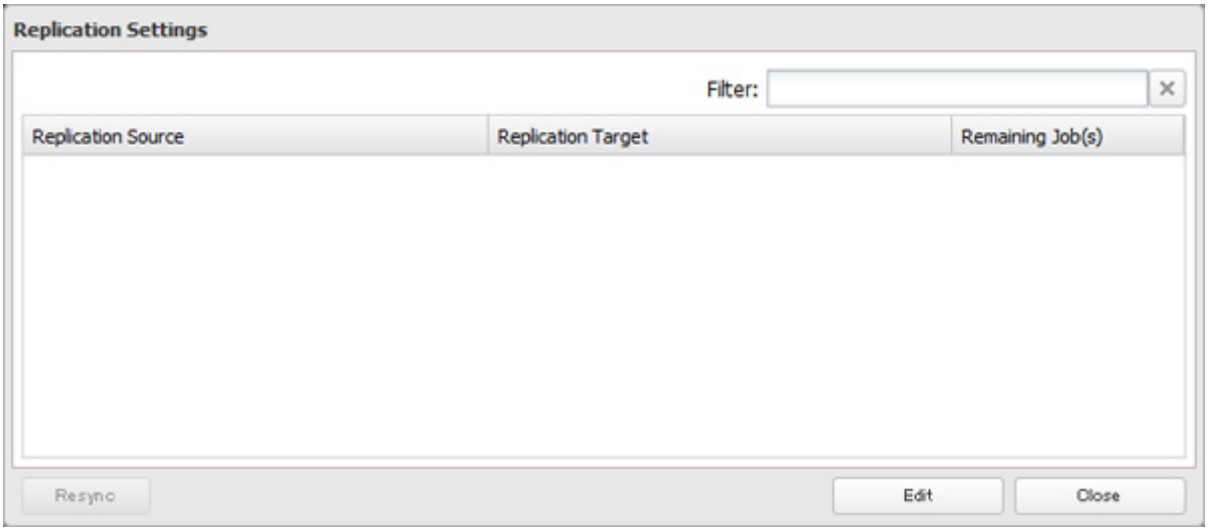
1 In Settings, click *Backup*.



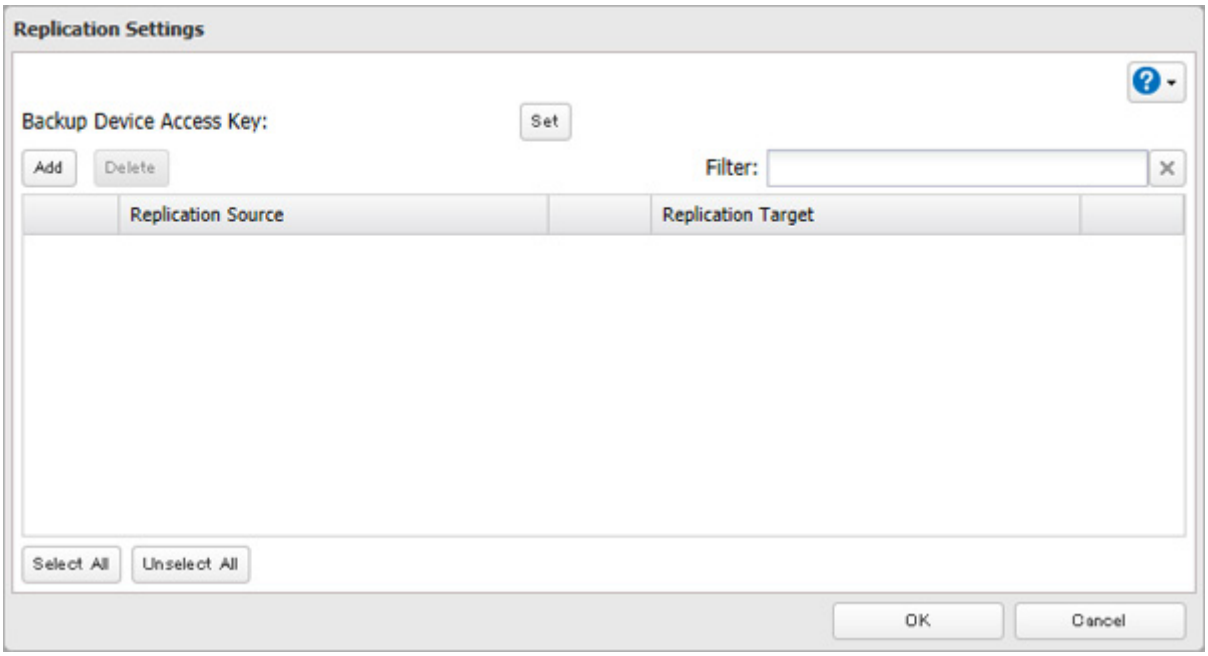
2 Click  to the right of "Replication".



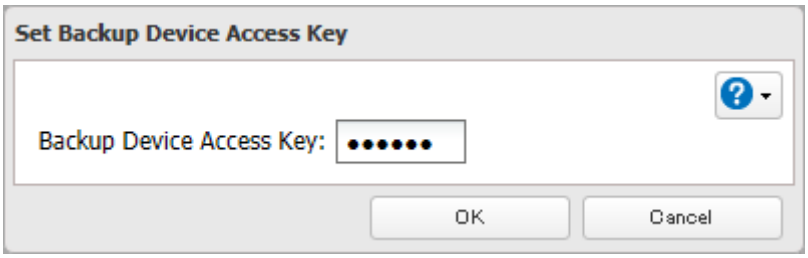
3 Click *Edit*.



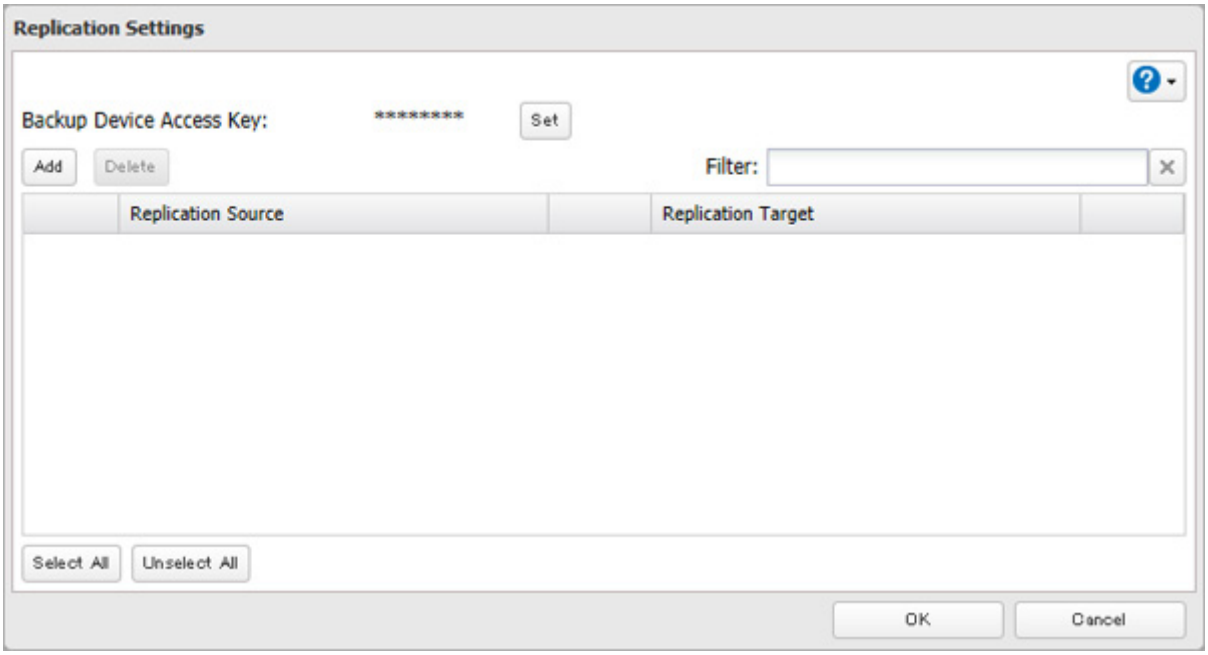
4 If you configured the backup device access key, click *Set*. If you didn't, proceed to step 5.



5 Enter the backup device access key and click *OK*.

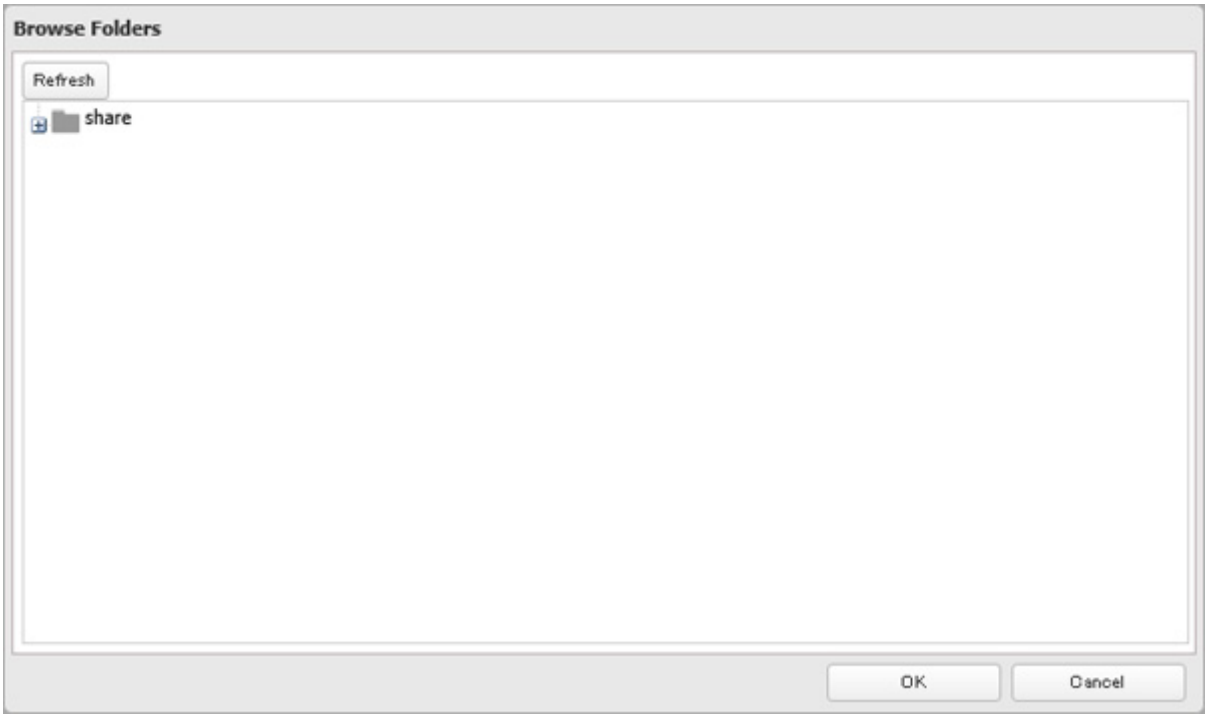


6 Click *Add*.



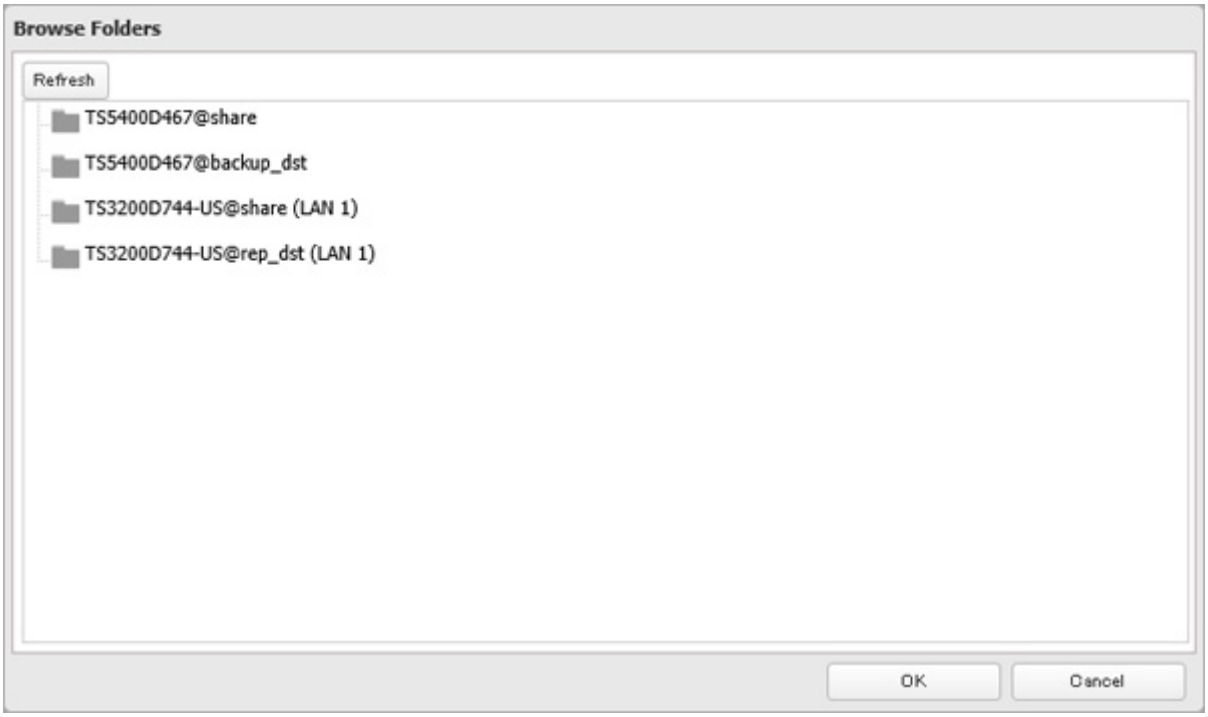
7 Click *Browse* under "Replication Source".

8 Select the shared folder that will be the replication source, then click *OK*.



9 Click *Browse* under "Replication Target".

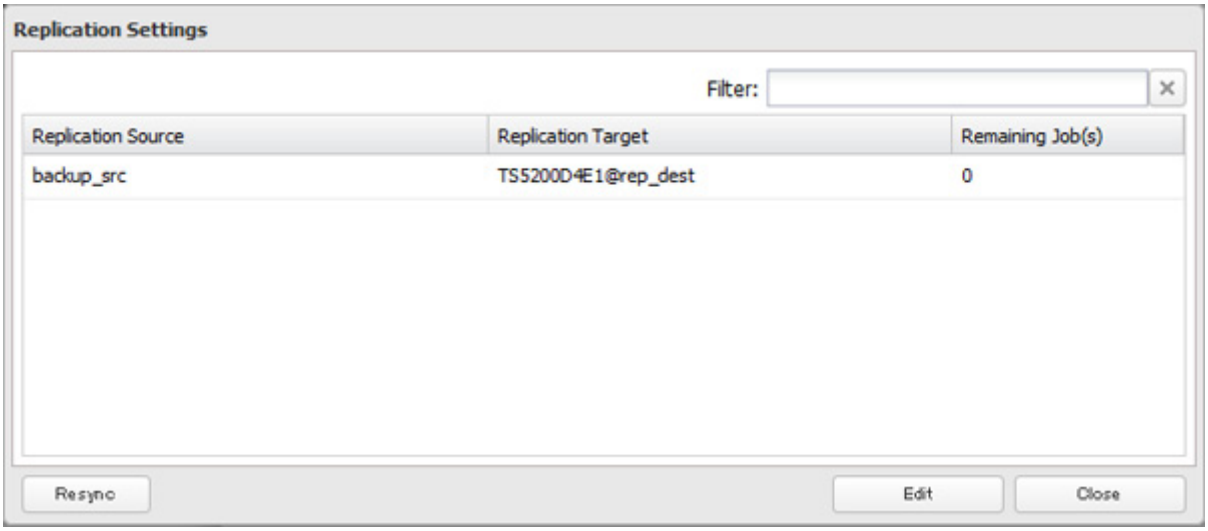
10 Select the shared folder that will be the replication destination, then click *OK*.



11 Click *OK*, then *Yes*.

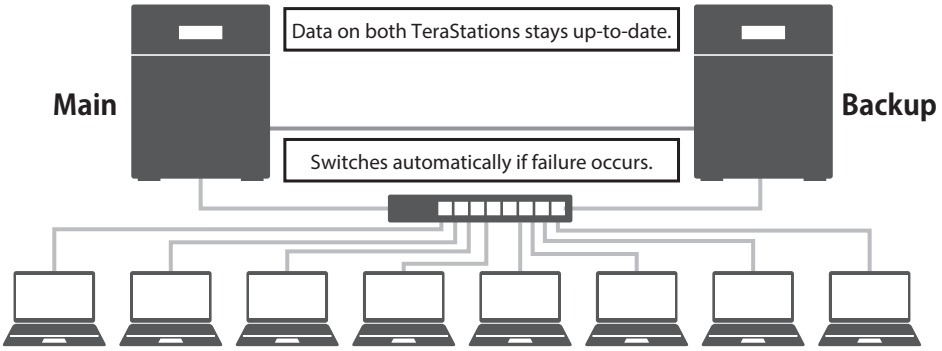
Notes:

- A maximum of 64 shared folders can be configured for replication.
- Replication can also be used to copy all data from a share to a share on an attached external drive. Format the drive with ext3 or XFS before using it for replication. Drives with FAT32 partitions are not supported with replication.
- You can select the first and second level of shared folders and USB drives connected to the TeraStation as the replication source. Folders whose names contain more than 80 alphanumeric characters cannot be selected.
- Don't use the same TeraStation for both failover and replication, or replication and Time Machine.
- Don't configure replication from one source folder to multiple destination folders.
- If a network problem causes a replication error, unsynced data may be shown as "0" even though replication is incomplete. Click *Resync* to recover from the replication error. All files from the source folder will be copied to the destination folder.



Failover

With failover, two TeraStations are connected to the network for redundancy. If an issue renders the main TeraStation inaccessible, operation automatically switches to the backup TeraStation.



Failover will activate during any of the following situations:

- **The backup TeraStation cannot detect the main TeraStation within a specified time**
  If the backup TeraStation has not received a packet from the main TeraStation within a specified time, the backup TeraStation considers the main TeraStation to have failed. By default, it will try 5 times and wait 60 seconds. If this is triggered by accident, reconfigure failover from the main TeraStation.
- **Errors**
  Failover will occur if any of the following errors occur:
  E12 (cooling failure), E14 (cannot mount RAID array), E16* (drive not found), E22* (cannot mount drive), E30* (drive failure)
  * When the drive is configured in JBOD.

Notes:

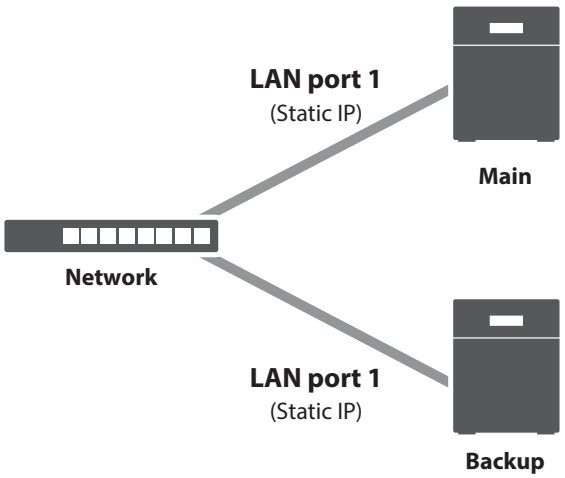
- Only use identical model and capacity TeraStations for failover. If the capacity of the main TeraStation is larger than that of the backup TeraStation, an I33 replication error will occur.
- All drive bays of a TeraStation should be occupied if it will be used for failover. Failover will not work if a drive is missing from any bay.

Before Configuring Failover

Use the same LAN ports for transferring data and configure both TeraStations with static IP addresses for the purposes of failover.
When failover, the backup TeraStation will take over the hostname and IP address of the main TeraStation unless the IP conflict is detected. If you want to assign different IP address to the backup TeraStation after failover, configure the "service IP address". The service IP address will be a new address of the backup TeraStation when it takes over operation from the TeraStation.

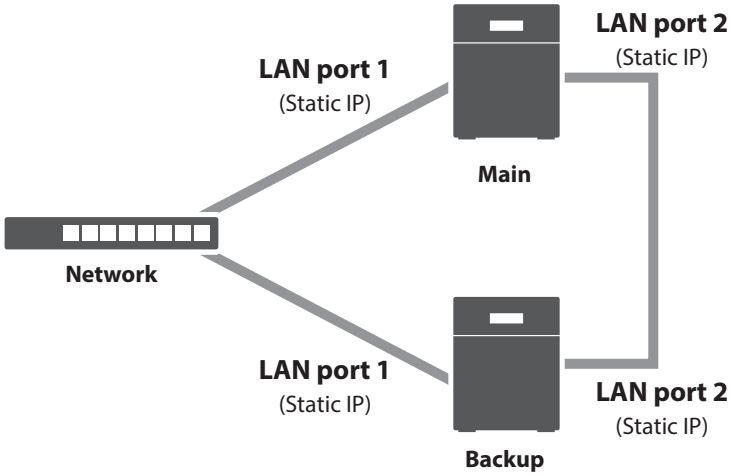
Using the Same LAN Port for Both Failover and Connecting to the Network

Using this setup, if the main TeraStation fails, the backup TeraStation will replace it completely. The backup TeraStation will be updated over normal network traffic.



Using Different LAN Ports for Connecting to the Network and Failover

With this setup, the backup TeraStation and main TeraStation are connected by a second Ethernet cable connecting their LAN 2 ports. Updating is done over this dedicated network path, so updates are quicker and don't interfere with normal network traffic.



- **LAN Port 1 for Alive Check and LAN Port 2 for Failover**
  Select the TeraStation labeled "(LAN1)" for "Registered Backup Device" and select "LAN 2" for "Backup LAN Port" in Settings.
  With this connection, the backup TeraStation will take over the IP address of the main TeraStation when the network error occurred on the side of LAN port 1. However, the communication still available normally using LAN port 2 so the backup TeraStation detects the IP conflict and the IP address of the main TeraStation will not be taken over to the backup TeraStation.
- **LAN Port 2 for Both Alive Check and Failover**
  Select the TeraStation labeled "(LAN2)" for "Registered Backup Device" and select "LAN 2" for "Backup LAN Port" in Settings.

Usage Restrictions

Functional Restrictions

Failover is not available when any of the following functions are enabled:

Replication, sleep mode, encrypted drive volume, MySQL server, media cartridge, LVM volume, iSCSI volume, port trunking, cloud storage, Dropbox Sync, surveillance server, hot spare, access restrictions by Active Directory or NT domain

Setting Restrictions

The following functions will not be available while failover is enabled:
Initializing settings, changing the RAID settings, formatting drives, iSCSI volume, changing the backup TeraStation's settings, turning the TeraStation on and off, updating the firmware

While failover is enabled, shutdown, power-on, and firmware update operations can be made available by temporarily changing the TeraStation to maintenance mode. Maintenance mode can be enabled or disabled at *Backup - Failover* in the main TeraStation's Settings. Click *Maintenance mode* to enable maintenance mode, or click *Cancel maintenance mode* to disable maintenance mode.
To update the firmware while in maintenance mode, the main TeraStation can be updated from Settings, but the backup TeraStation cannot. Download the firmware updater from the Buffalo website for the backup TeraStation and try updating the firmware through it.

Non-Transferable Settings

The settings below are not copied from the main TeraStation to the backup TeraStation. Make a note of the original settings so that they can be configured manually if failover errors.
Web server (including PHP), MySQL server, Direct Copy, WebAccess*, print server, UPS synchronization, antivirus**, SNMP (when using SNMPv3)
* If the backup TeraStation took over the main TeraStation's IP address after failover, the WebAccess settings will not be copied. Re-register your BuffaloNAS.com account for WebAccess. If the backup TeraStation kept its IP address, the settings will be copied from the main TeraStation.
** The settings configured on the Trend Micro NAS Security settings page will not be copied to the backup TeraStation. The settings configured on the main TeraStation's Settings page will be copied. Only if the antivirus is activated on the TeraStation.

Using with UPS

Once failover is configured, you cannot set up a UPS for the backup TeraStation. Configure your UPS before configuring failover. UPS recovery can be configured for both the main and backup TeraStations.

Configuring Failover

1 In Settings for the main TeraStation, click *Backup*.

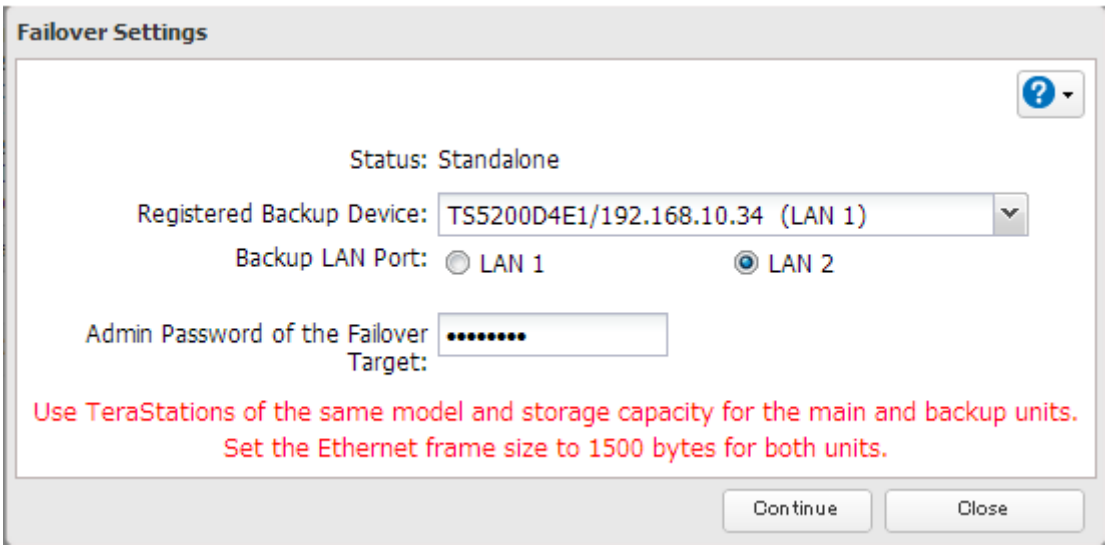


2 Click  to the right of "Failover".



3 Click *Edit Failover Status*.

4 Select a TeraStation to be the target backup device.



5 Enter the administrator password of the target backup device, then click *Continue*.

6 If the administrator password is correct, the backup TeraStation will beep. To accept the settings from the main TeraStation, hold down the function button on the front of the backup TeraStation until it stops beeping.

7 The I51 message will display on the LCD panel and NAS Navigator2 for both TeraStations. Wait until initialization finishes. Failover is configured after it finishes and the I51 message disappears.

8 To avoid a possible IP conflict after failover occurs, configuring a service IP address from the main TeraStation's Settings is recommended.

Notes:

- If replication is configured for more than one folder, initialize the TeraStation before configuring failover.
- The main TeraStation cannot be used as the backup location for Time Machine.
- Do not use the same TeraStation for both failover and replication, or failover and Time Machine.
- If email notification is enabled and failover occurs, navigate to *Management - Email Notification - Edit* in the main TeraStation's Settings and click *OK*.
- Ethernet frame size settings for main and backup TeraStations should be 1500 bytes. To change the Ethernet frame size, navigate to *Network - IP Address*, click the LAN port, and change the Ethernet frame size to "1500" bytes.
- Files whose filenames contain more than 80 alphanumeric characters will not be backed up.
- If the I33 error message appears on the LCD panel, navigate to *Backup - Replication* and click *Resync*.
- The RAID array on the backup TeraStation may be reconfigured and resynchronized as part of the failover configuration process. This is expected behavior and not an error.

Replacing to the Backup TeraStation Manually

If "Switch to backup unit manually" is selected in the *Advanced Settings* tab on the main TeraStation's Settings, the backup TeraStation will not replace the main TeraStation if the main TeraStation fails. To have the backup TeraStation replace the main TeraStation, you can either:

- Log in to Settings for the backup TeraStation and click *Set as Main Unit*.
- Or, press and hold down the function button on the backup TeraStation.

Note: If the main TeraStation fails but both LAN ports' link on the backup TeraStation is up, the backup TeraStation cannot replace to the main TeraStation from Settings. In such a case, use the function button instead.

Reconfiguring After Failover Occurs

When the backup TeraStation replaces the main TeraStation, the I49 message may appear on the backup TeraStation's LCD display and in NAS Navigator2.

To configure failover again, follow the procedure below with the new TeraStation unit. The following procedure is an example using the replaced backup TeraStation ("main TeraStation") and the new TeraStation ("backup TeraStation").

Note: This procedure will also work if failover occurs unexpectedly.

1 After failover occurs, log in to Settings for the main TeraStation.

Note: If you configured to sync with the UPS device connected to the failed TeraStation, the E10 error message will be displayed on the main TeraStation. In such a case, follow the procedure below to configure the UPS settings again.

(1) Disconnect the UPS cable from the failed TeraStation and connect it to the main TeraStation.

(2) In the main TeraStation's Settings, click *Management*.

(3) Click  to the right of "UPS Sync".

(4) Click *Edit*.

(5) Select "Sync with UPS connected to this TeraStation" and reconfigure the desired UPS settings.

(6) Click *OK* when finished.

2 In Settings, click *Backup*.

3 Click  to the right of "Failover".

4 Click *Edit Failover Status*.

5 Click *Force Failover to Stop* to cancel the failover settings.

6 Shut down this main TeraStation.

7 Turn the backup TeraStation on.

8 Log in to Settings for the backup TeraStation, then rename the TeraStation's hostname and configure the IP address so that it has a new static IP address.

9 Power on the main TeraStation. If you want to configure the UPS sync on the backup TeraStation, configure the settings here. To sync with the UPS device connected to the main TeraStation, follow the procedure below.

(1) In the backup TeraStation's Settings, click *Management*.

(2) Click  to the right of "UPS Sync".

(3) Click *Edit*.

(4) Select "Sync with UPS connected to another LinkStation or TeraStation on the same network" and configure the main TeraStation as a sync source.

(5) Click *OK* when finished.

10 Reconfigure failover by referring to the "Configuring Failover" section above.

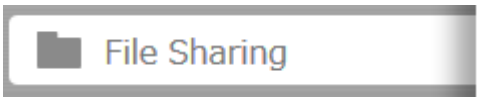
If you don't want to configure failover with the new TeraStation, cancel the failover settings and restart both TeraStations. The I49 message will disappear.

Note: If you cancel the failover settings forcibly, attributes of the shared folders will become read-only. Change the attribute settings to the desired option if necessary.

Backing Up Your Mac with Time Machine

Time Machine is a backup program included with macOS. Configure your TeraStation as shown to use Time Machine.

1 In Settings, click *File Sharing*.



2 Move the AFP switch to the  position to enable AFP.



3 Click  to the right of "Folder Setup".



4 Choose a shared folder as your backup destination for Time Machine.

5 Click *Edit*.

6 Under "LAN Protocol Support", select the "AFP (Mac)" checkbox and click *OK*.

7 Click *OK*, then *Close*.

8 Click *Backup*.

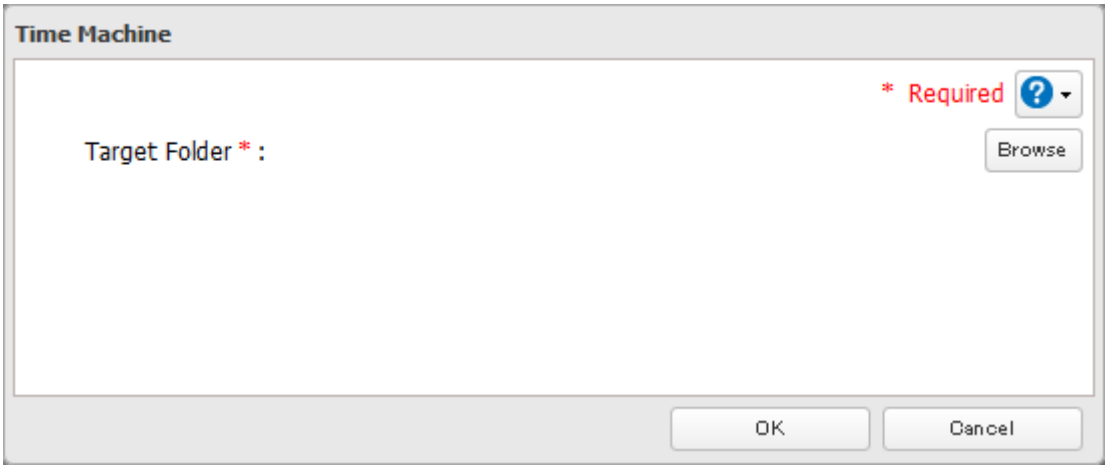


9 Click  to the right of "Time Machine".

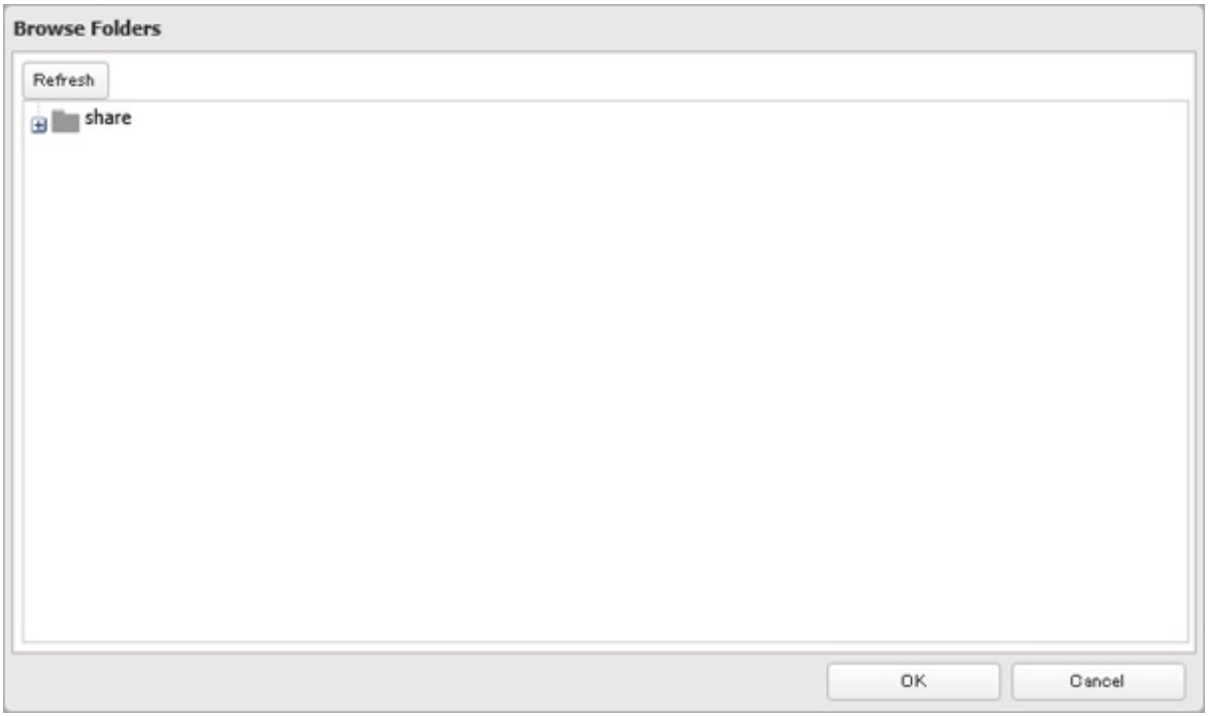


10 Click *Edit*.

11 Click *Browse*.



12 Select the shared folder that you set in the previous step, then click *OK*.



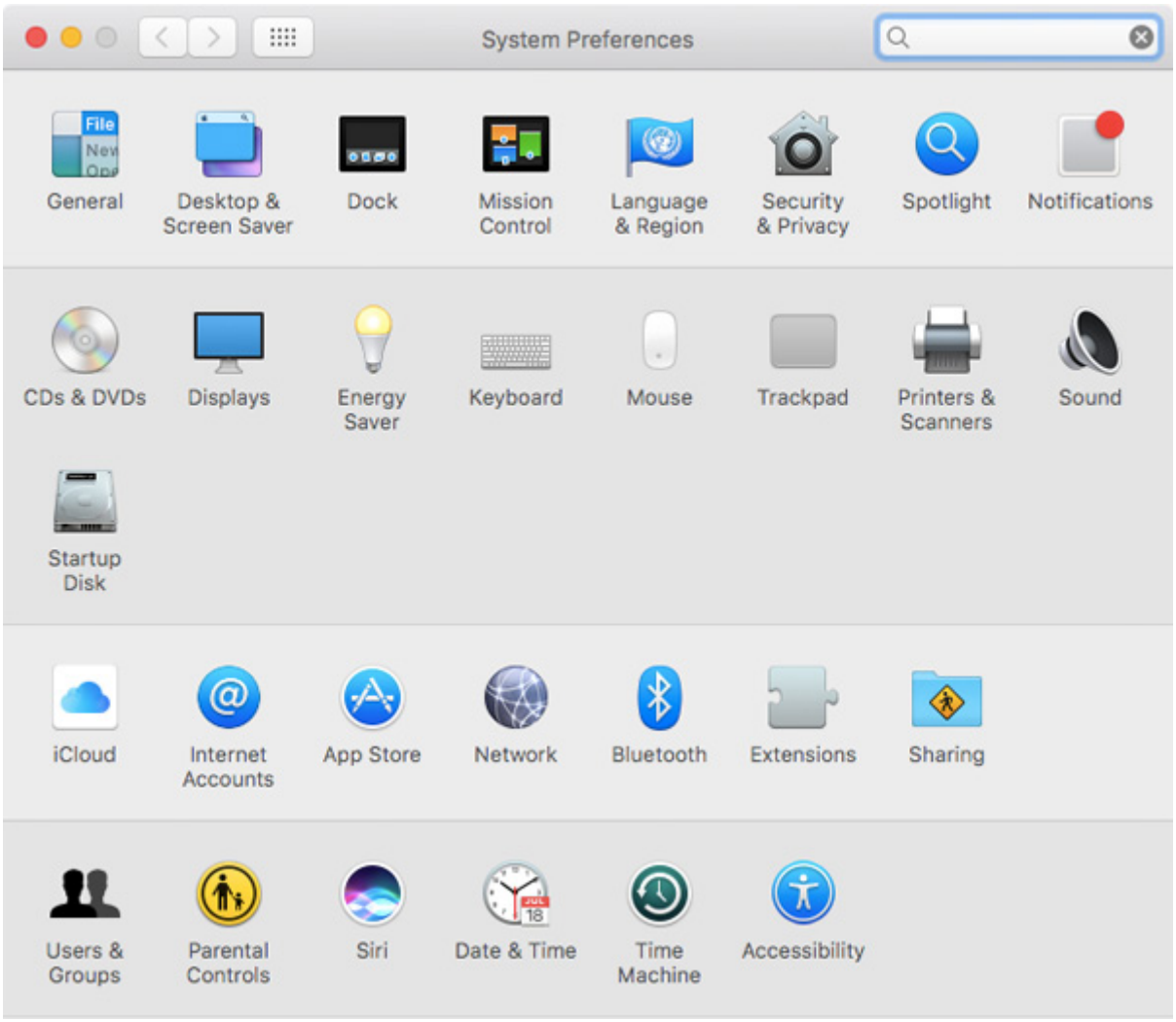
13 Click *OK* twice.

14 Move the Time Machine switch to the  position to enable Time Machine.

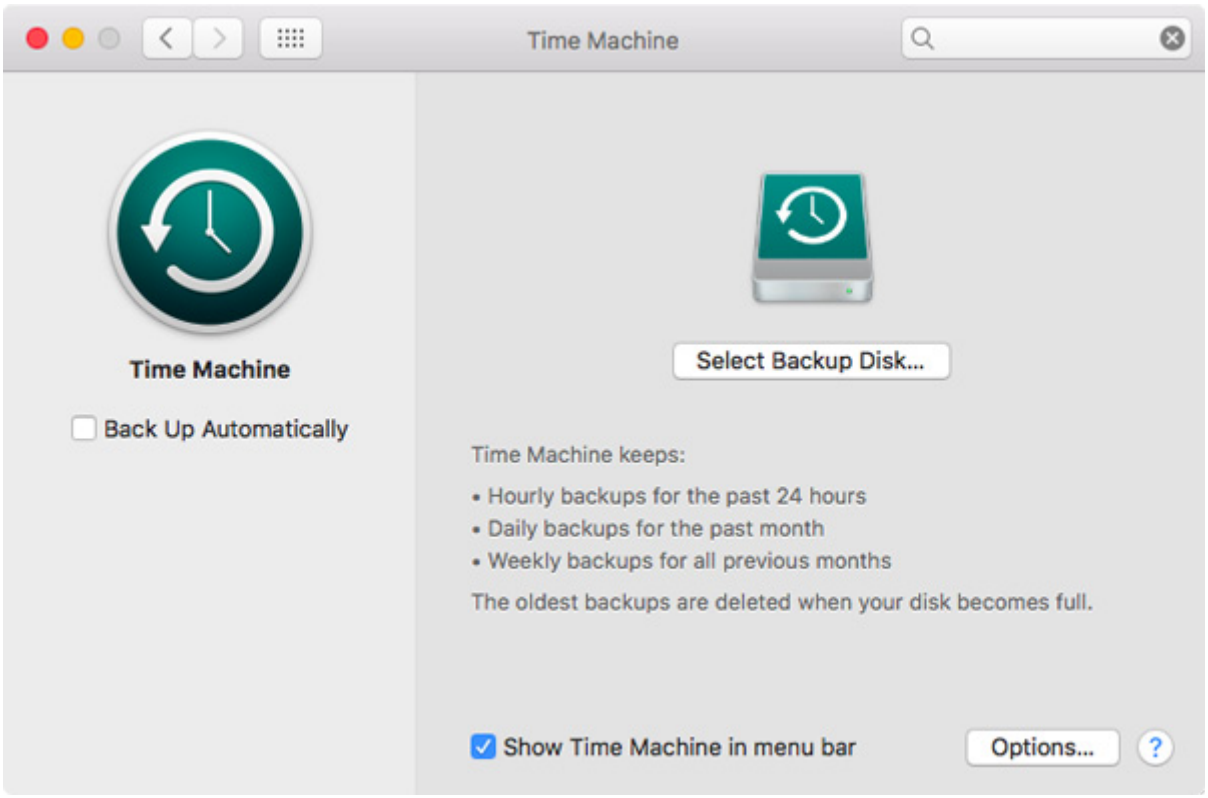


15 On the Mac, open *System Preferences*.

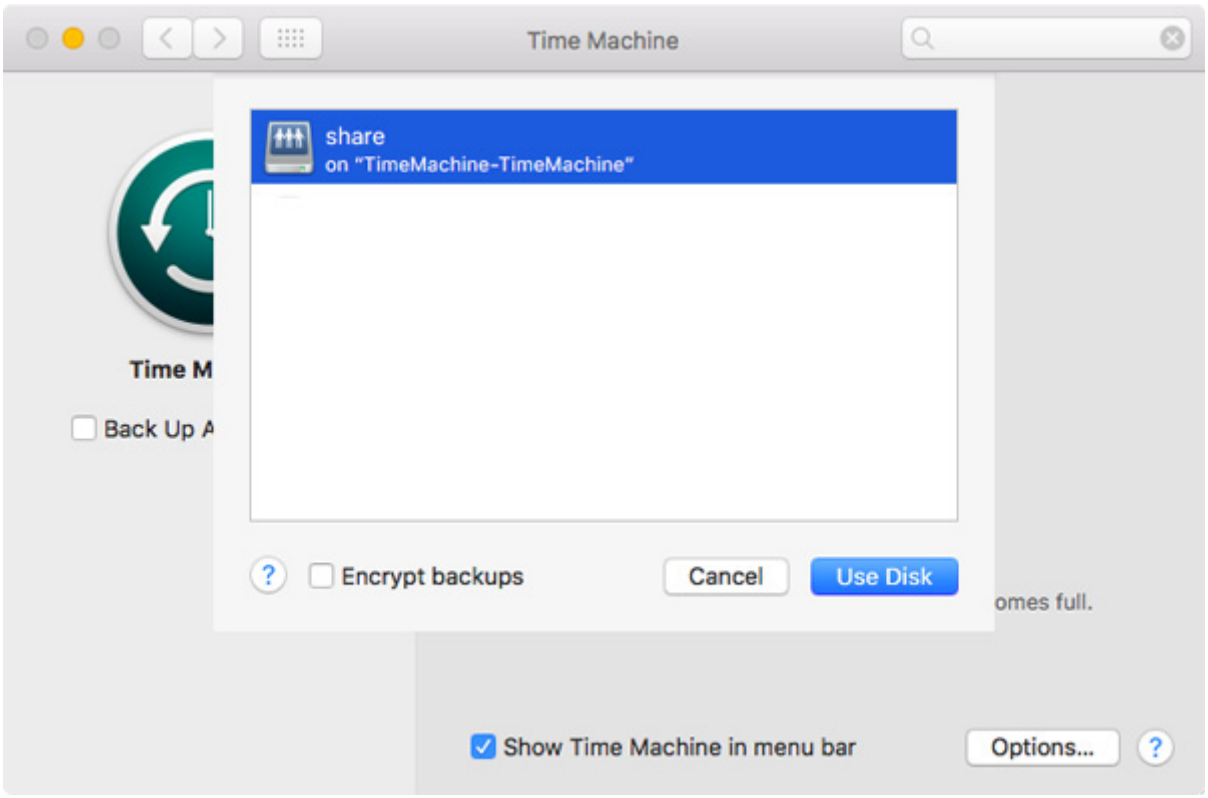
16 Click *Time Machine*.



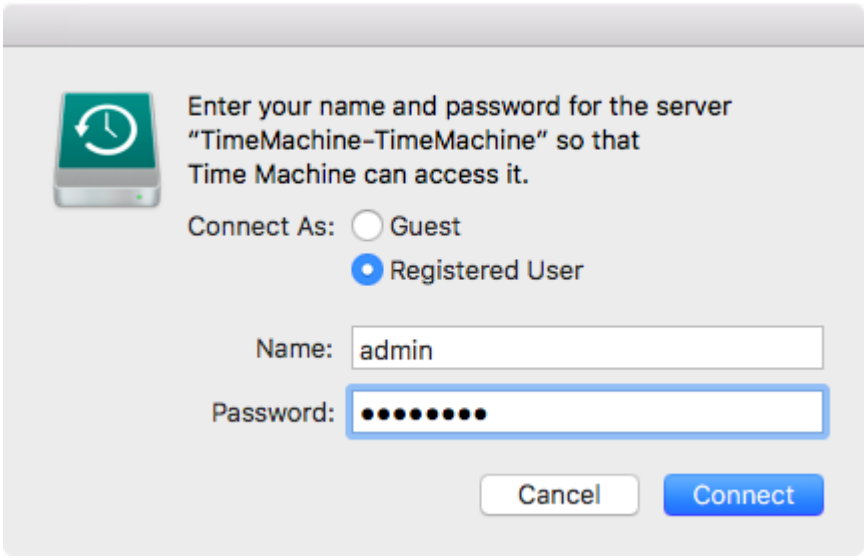
17 Click *Select Backup Disk*.



18 Select the TeraStation, then click *Use Disk*.

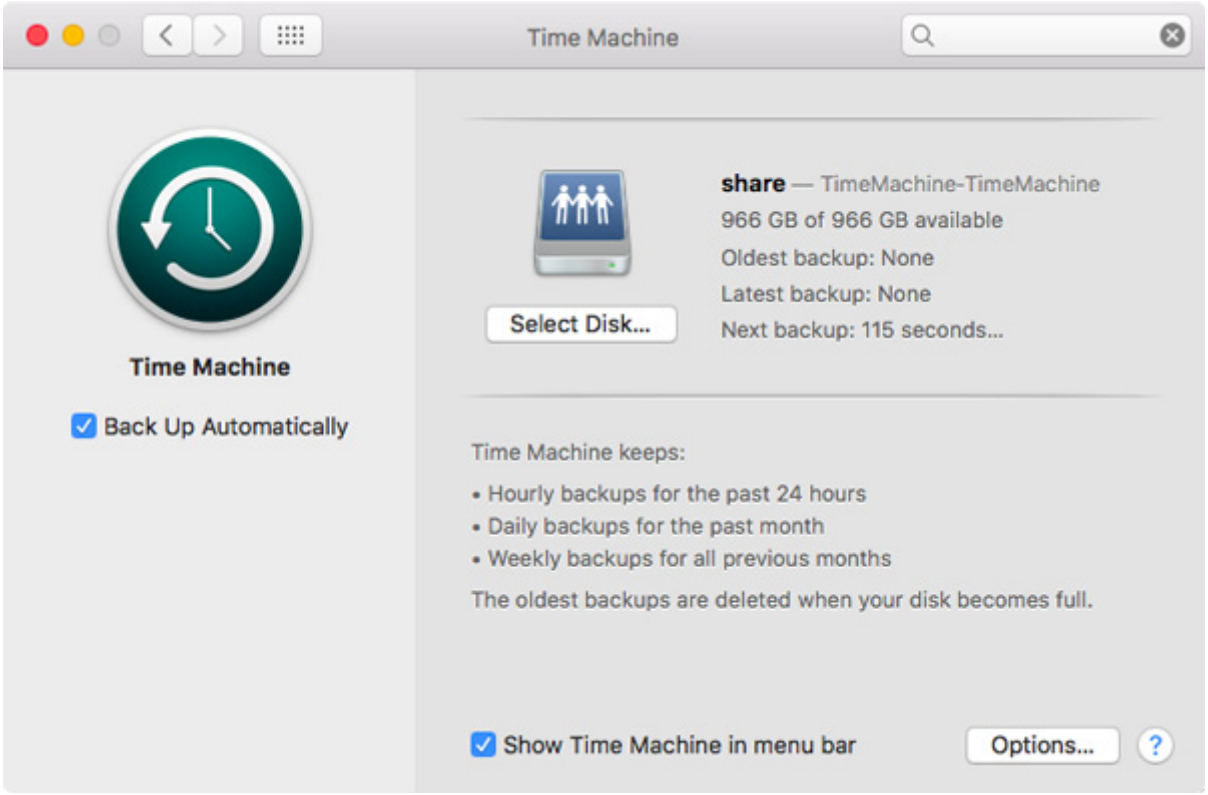


19 Enter a username and password with the rights to access the shared folder of the TeraStation, then click *Connect*.



Note: If access restrictions are not configured on the destination share, log in with the administrator account. The default username and password for the administrator account are "admin" and "password". If access restrictions are configured, log in with an account with write privileges.

20 Time Machine will count down from 120 seconds, and backup will begin.



Copying from a USB Device

Use Direct Copy to copy from a USB device directly to the TeraStation.

Note: To use Direct Copy, connect only one USB device at a time.

These devices are supported:

- USB mass storage devices
- Card readers (except for card readers that can recognize two or more memory cards)
- Digital cameras and other PTP devices

1 In Settings, click *Backup*.



2 Move the Direct Copy switch to the  position to enable Direct Copy.



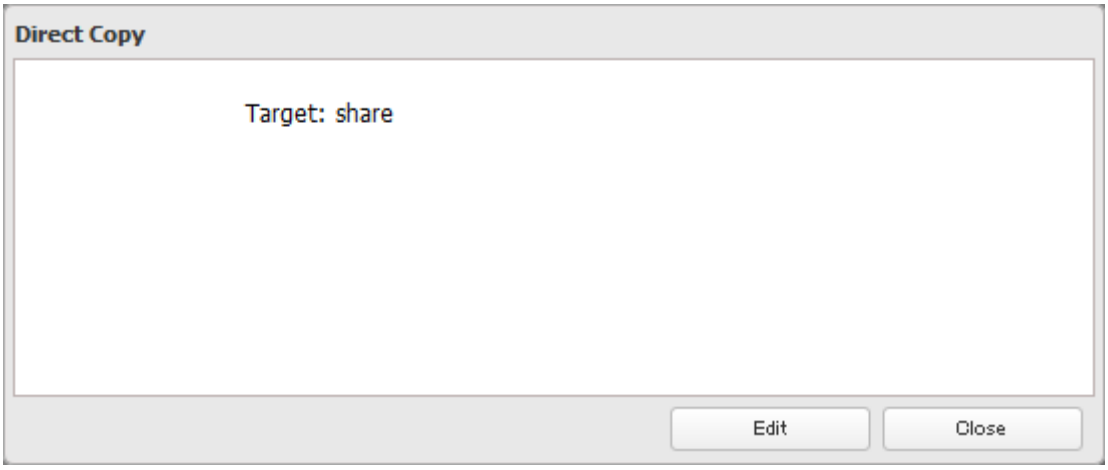
3 Connect the USB device. When it mounts (about 10 seconds), the function button will light up.

Note: Unsupported devices will not cause the function LED to light.

4 You now have 60 seconds to hold down the function button for 3 seconds. If you do, the function button will flash as all the files on the USB device are copied to the Direct Copy folder of the TeraStation.

Notes:

- While the function button is flashing, press and release it quickly to cancel Direct Copy.
  For digital cameras that are not in the USB mass storage class, all files in the digital camera are copied.
- To change the Direct Copy target folder, navigate to *Backup* - *Direct Copy* - *Edit*, select a new folder, and click *OK*.



5 When the copy operation is finished, the access LED of the USB device will stop flashing. Dismount the USB device from the TeraStation referring to the "Dismounting Drives" section in chapter 4.

Chapter 6 Remote Access

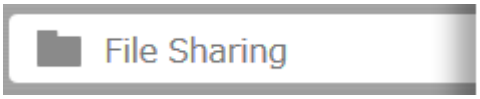
WebAccess

WebAccess is a software utility for accessing the files in the shared folder of your TeraStation from your computer or mobile devices through the Internet. **Be careful when configuring WebAccess. Certain settings can make the files in the shared folder available to anyone on the Internet, without any access restrictions.**

Notes:

- You can also configure WebAccess from Easy Admin.
- WebAccess supports downloading up to 60,000 files at a time. Attempting to download up to 60,000 files at a time may result in unexpected behavior.

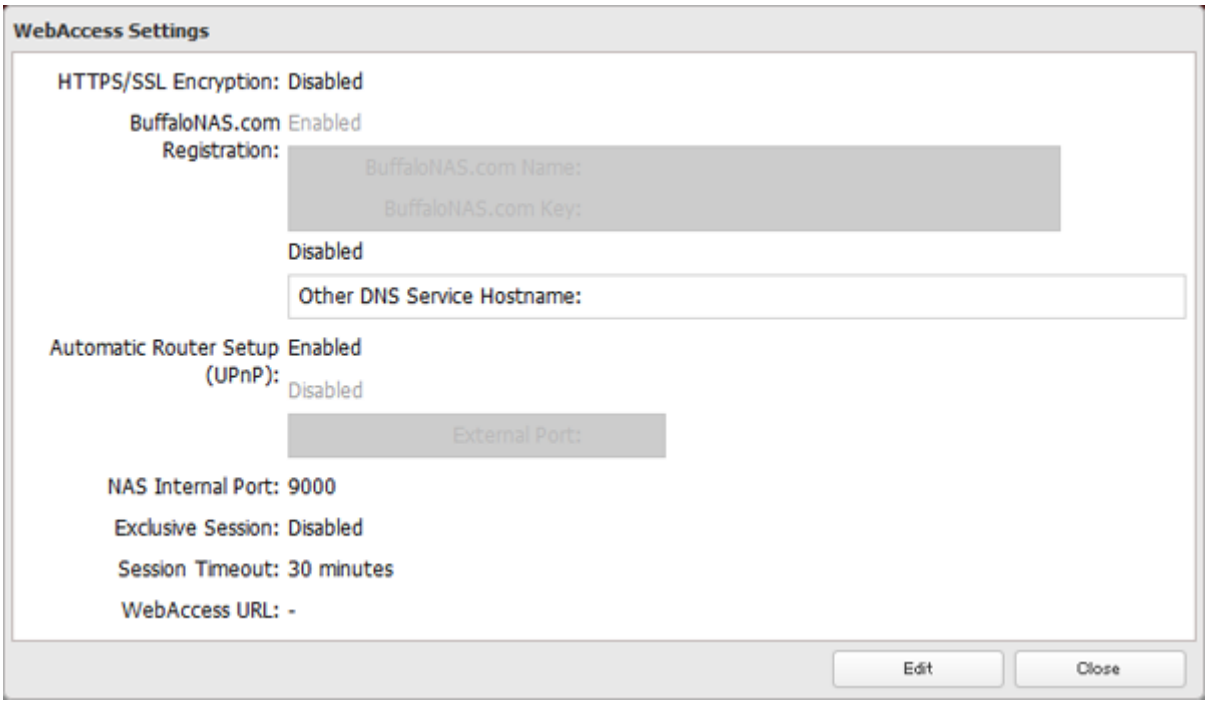
1 In Settings, click *File Sharing*.



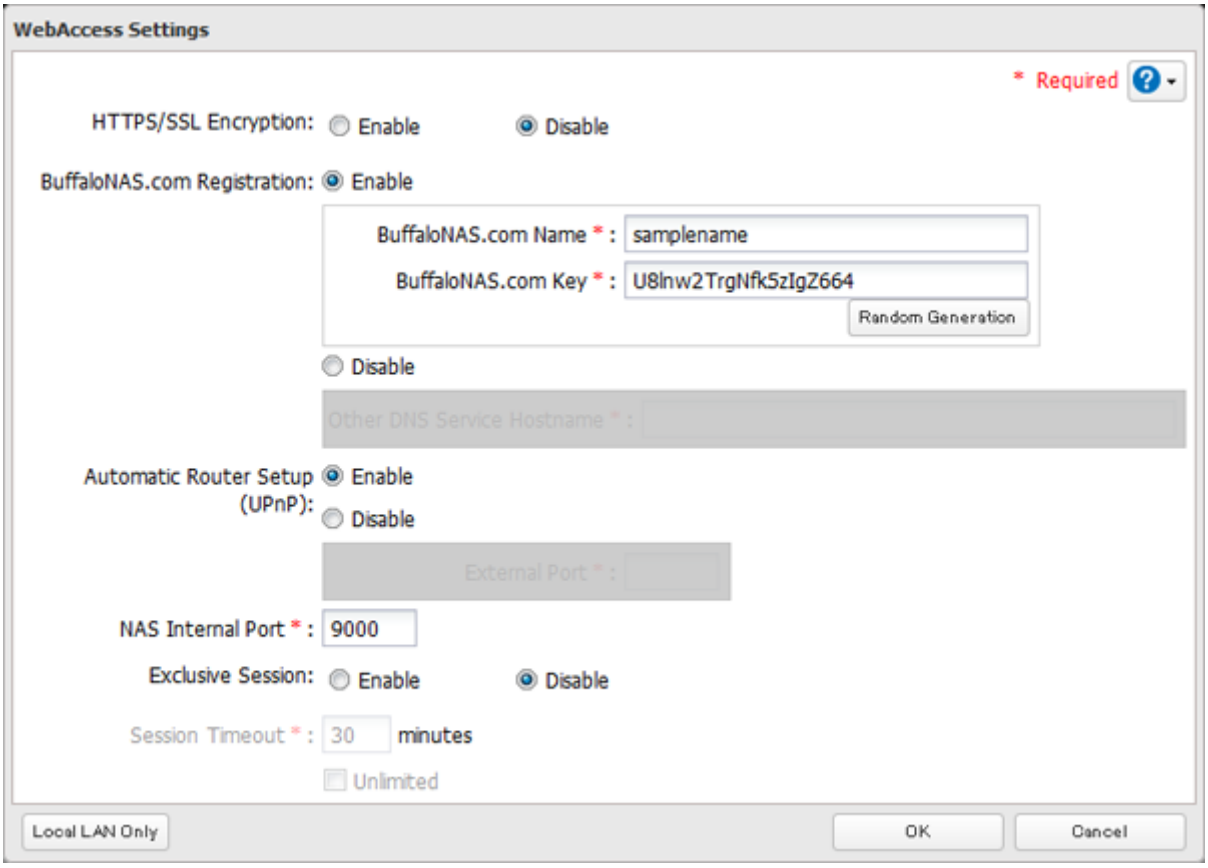
2 Click  to the right of "WebAccess".



3 Click *Edit*.



4 Configure the desired settings, then click *OK*.



- You may use the BuffaloNAS.com server as a DNS server, or disable it to use a different DNS server.
- Choose a "BuffaloNAS.com Name" and "BuffaloNAS.com Key" for your WebAccess account. Names and keys may use 3 to 20 alphanumeric characters, underscores (_), and hyphens (-).
- If "Exclusive Session" is enabled, multiple users cannot be logged in to WebAccess at the same time. Only the last login will be active.
- Enter a time in minutes (1 to 120, or "Unlimited") before inactive users are logged out of WebAccess.

5 Click *OK*.

6 Move the WebAccess switch to the  position to enable WebAccess.

7 Click  to the right of "Folder Setup".



8 Select a shared folder to publish.

Notes:

- For best results, create a new dedicated share for WebAccess.
- When accessing shared folders through WebAccess from a remote location, a username and password may be required for certain operations. For best results, create a user account with permissions on the WebAccess share before using WebAccess.

9 Click *Edit*.

10 Under "LAN Protocol Support", select the "WebAccess" checkbox.

11 Select the desired WebAccess security levels for "WebAccess Public Mode", then click *OK*.

There are many ways to access WebAccess folders depending on your device.

- From a computer, supported browsers include Internet Explorer 8, Firefox 3.6, and Safari 4.
  Instructions: http://buffalonas.com/manual/en/
- To access from an iOS device, install the "WebAccess i" application from the App Store.
  Instructions: http://buffalonas.com/manual/i/en/
- To access from an Android device, install the "WebAccess A" application from Google Play.
  Instructions: http://buffalonas.com/manual/a/en/
- To access from a Windows Phone, install "WebAccess" from the Windows Phone Store.
  Instructions: http://buffalonas.com/manual/wp/en/

Notes:

- The following levels of security are available:
  "Allow Anonymous" - Anyone can access (view) shared folders.
  "Allow All Groups and Users" - All groups and users registered on the LinkStation or TeraStation can use WebAccess.
  "Use Inherited Folder Permissions" - Users and groups have the same access permissions with WebAccess that they do locally. If access restrictions are not set for the shared folder, then this option will not be shown.
- When a user or group can access a folder through WebAccess depends on a combination of WebAccess settings and the shared folder's settings.

Folder setup	WebAccess public mode	Allow Anonymous		Allow All Groups and Users		Use Inherited Folder Permissions	
	Folder attribute	Read and write	Read only	Read and write	Read only	Read and write	Read only
WebAccess account	Not logged in	R	R	-	-	-	-
	User with read and write access	R/W	R	R/W	R	R/W	R
	User with read-only access	R/W	R	R/W	R	R	R
	Group with read and write access	R/W	R	R/W	R	R/W	R
	Group with read-only access	R/W	R	R/W	R	R	R
	Other users	R/W	R	R/W	R	-	-

R: Read only, R/W: Read and write, -: No access

WebAccess Remote

WebAccess Remote lets you open a shared folder on a remote TeraStation or LinkStation from Explorer, My Computer, or other file manager.

To use WebAccess Remote, the following conditions must be satisfied.

- You have TeraStations or LinkStations in two different locations, such as at home and at a remote location.
- WebAccess should be enabled on the source TeraStation.

Note: Set the TeraStation's time settings to the correct time. Using NTP is recommended. To configure NTP settings on the TeraStation, refer to the "Name, Date, Time, and Language" section in chapter 10.

1 In Settings, click *Web Services*.

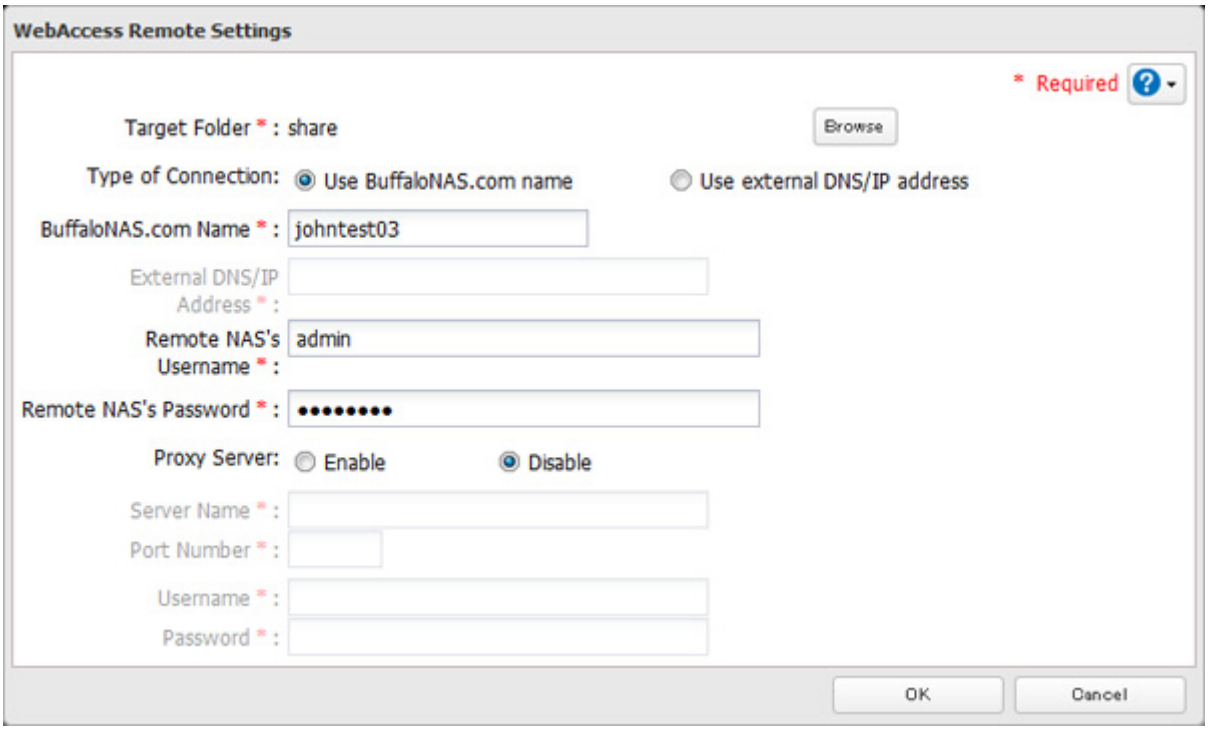


2 Click  to the right of "WebAccess Remote".



3 Click *Edit*.

4 From "Target Folder", select the shared folder that will be connected.



Note: The selected folder is used internally by "WebAccess Remote". Files are not added to this folder and the amount of used space does not increase.

5 You may choose to enter a BuffaloNAS.com name or an external DNS/IP address. If using a BuffaloNAS.com name, it should be the same BuffaloNAS.com name assigned to the source TeraStation. If using an external DNS/IP address, enter either the IP address of your DNS server, or the global IP address of the remote TeraStation's WebAccess.

6 Enter the remote TeraStation's WebAccess username and password.

7 Click *OK*.

8 Move the WebAccess Remote switch to the  position to enable WebAccess Remote.



9 You can directly access the shared folder in the remote TeraStation by entering the path displayed in "Target Folder" into the address bar in Explorer, My Computer, or other file manager.

Notes:

- If using after the network has been temporarily disconnected, click *Remount*.
- Do not copy more than 100,000 files at once to the WebAccess Remote target folder. If copying fails, try again with fewer files.

- Be careful with existing files in the target folder, as files with the same name will be overwritten even if copied files are older.
- If you copy a file to the WebAccess Remote source folder using Explorer or a backup process, the file will also be copied sequentially to the WebAccess Remote target folder. This second copying process will start in the background during the first copying process and will not be visible. If you shut down or restart the TeraStation immediately after copying a file to the source folder, the file may not be copied to the target folder. Try copying the file again if this occurs.
- If saving 1 TB or more files to or from the WebAccess Remote target folder, make sure there is enough free space on the WebAccess Remote source TeraStation for temporary file caching. For example, when saving 1 TB of files to the WebAccess Remote target folder, it is recommended to keep at least 2 TB of free space available.

FTP

By default, the TeraStation's shares are only accessible by users connected to the same network or router as the TeraStation. The optional FTP server allows users outside the local network to access the TeraStation.

Note: FTP is intended for users who already have FTP client software and have experience with it.

1 In Settings, move the FTP switch to the  position to enable FTP.



2 Click  to the right of "Folder Setup".



3 Choose a folder to enable remote FTP access on.

4 Click *Edit*.

5 Select read-only or read and write for the shared folder's attribute; under "LAN Protocol Support", select the "FTP" checkbox and click *OK*.

Accessing the TeraStation with an FTP Client

To access the TeraStation via FTP, configure your FTP client software with the following settings:

- Hostname: IP address of the TeraStation
- Username: The TeraStation's username
- Password: The TeraStation's password
- Port: 21

Accessing the TeraStation with an Anonymous User

To allow anonymous access to your FTP share, disable access restrictions. Configure your FTP client software with the following settings for anonymous FTP access:

- Hostname: IP address of the TeraStation
- Username: Anonymous
- Password: Any character string
- Port: 21

Notes:

- If the TeraStation joins a domain, anonymous users cannot access it.
- Shared folders connected by FTP are available from the "/mnt" directory. The examples of default locations are:

/mnt/array1/share
/mnt/disk1/share
/mnt/usbdisk1

- If a file was created or copied by AFP, you may not be able to delete it using an FTP connection. If this occurs, use an SMB or AFP connection instead to delete the file.
- For FTP connections, make sure that the total filename including directory path is 250 single-byte characters or less.

Cloud Storage

The TeraStation supports Amazon S3, a fee-based online storage service provided by Amazon, and other cloud storage services that share the Amazon S3 API. Follow the procedure below to configure your TeraStation to use with your cloud storage service:

Note: Set the TeraStation's time settings to the correct time. Using NTP is recommended. To configure NTP settings on the TeraStation, refer to the "Name, Date, Time, and Language" section in chapter 10.

Configuring Cloud Storage

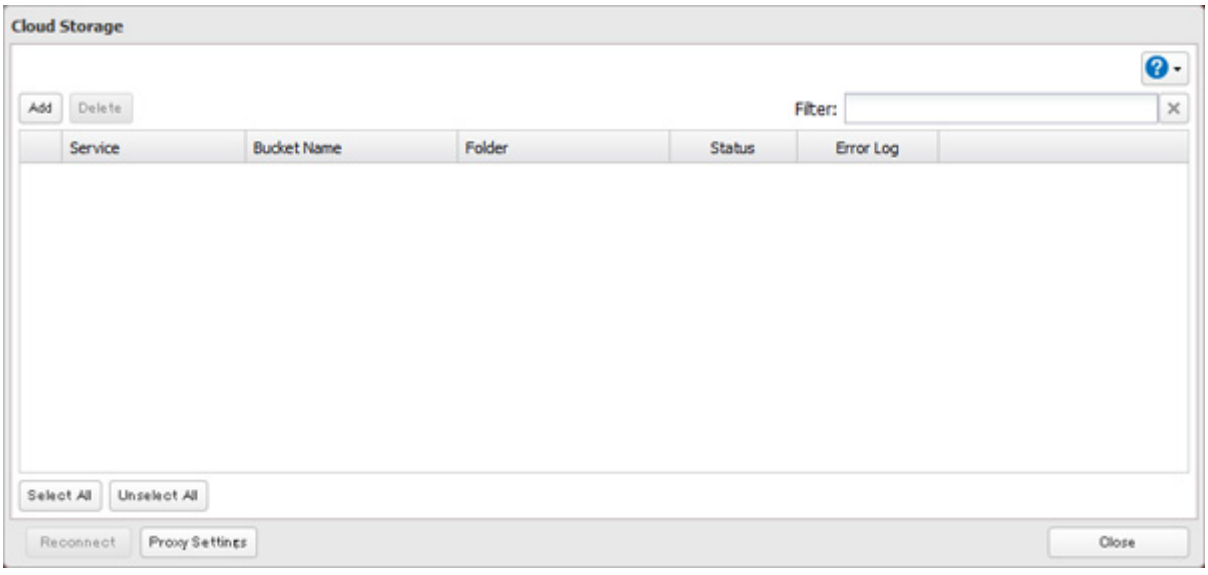
1 In Settings, click *Web Services*.



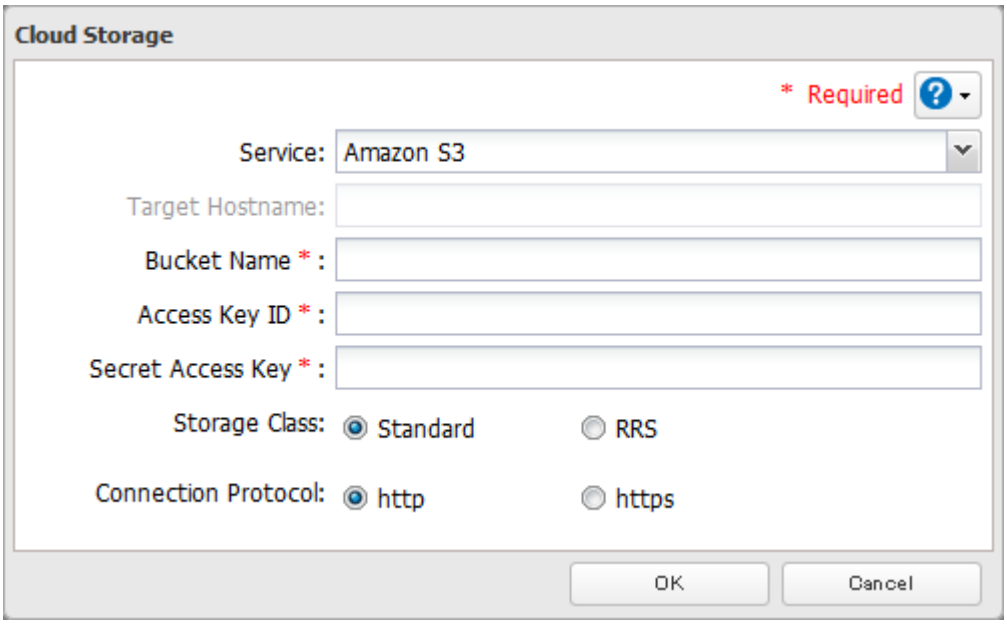
2 Click  to the right of "Cloud Storage".



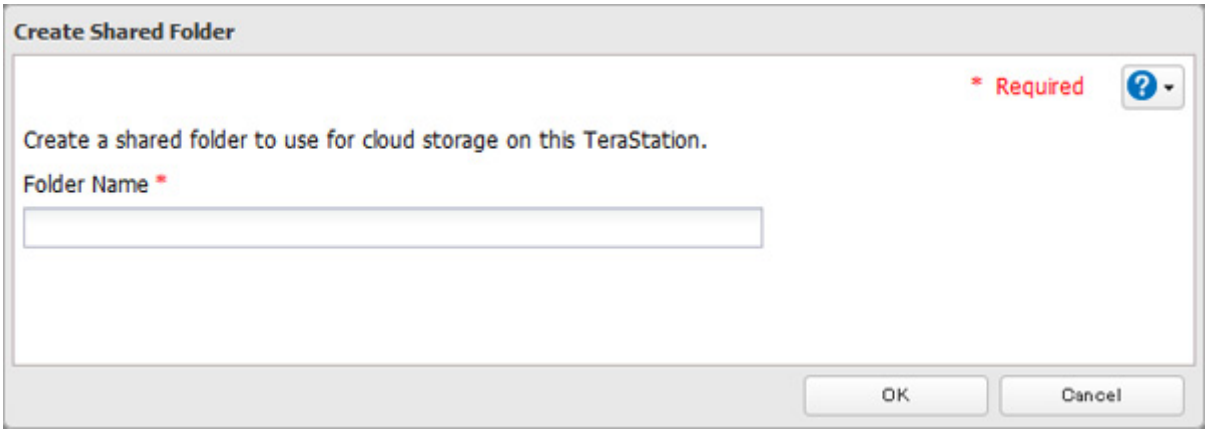
3 Click *Add*.



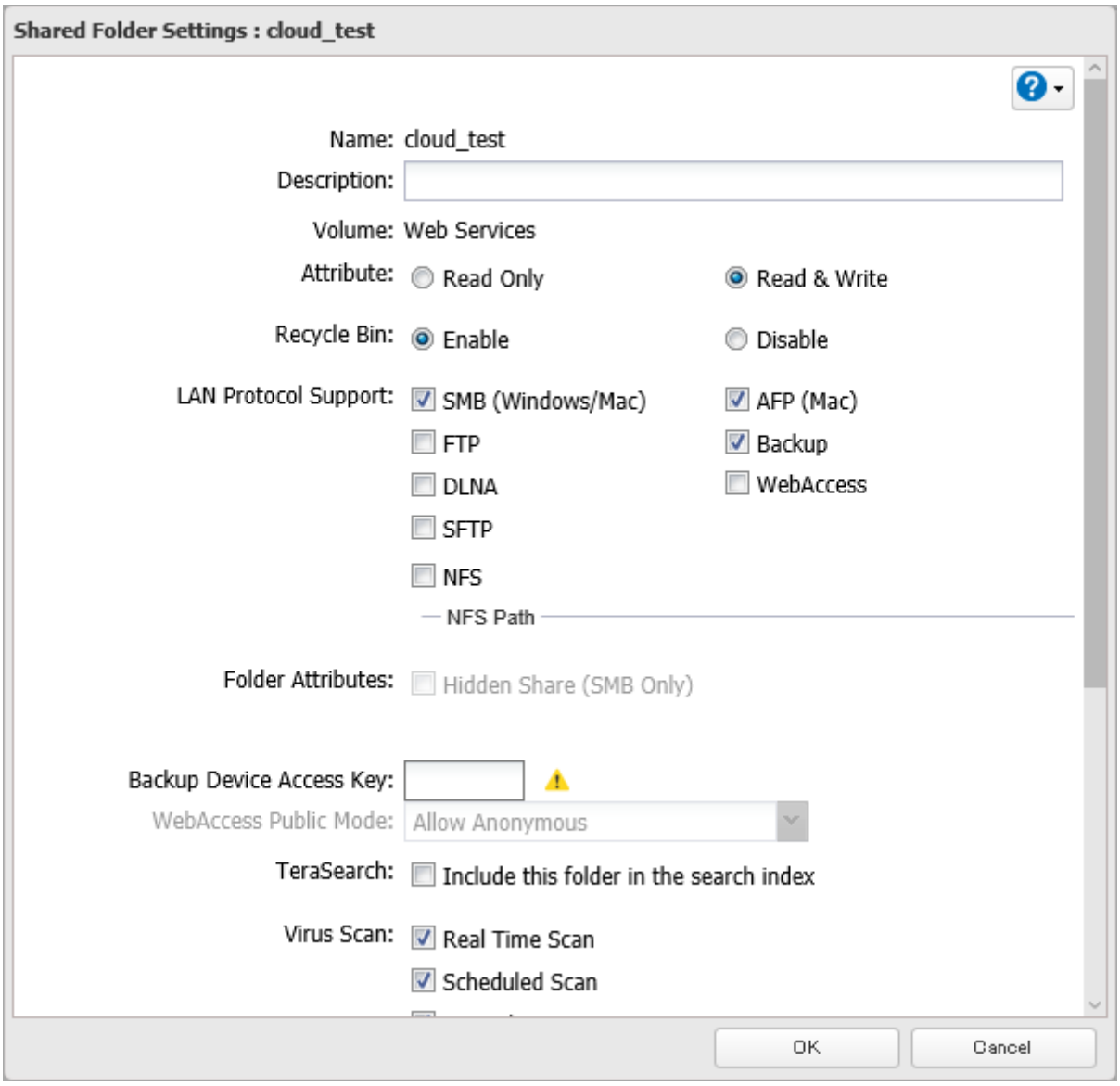
4 Select the service name from the drop-down list. Enter the bucket name, access key ID, and secret access key; select the storage class and the connection protocol, then click *OK*.



5 Enter a shared folder name to use with the cloud storage service and click *OK*.



6 Under "LAN Protocol Support", select the "Backup" checkbox and enter the desired shared folder settings. Click *OK*.



7 Click *OK*.

8 Click *Close*.

Uploading Files to Cloud Storage

To upload files to cloud storage, using backup job is recommended.

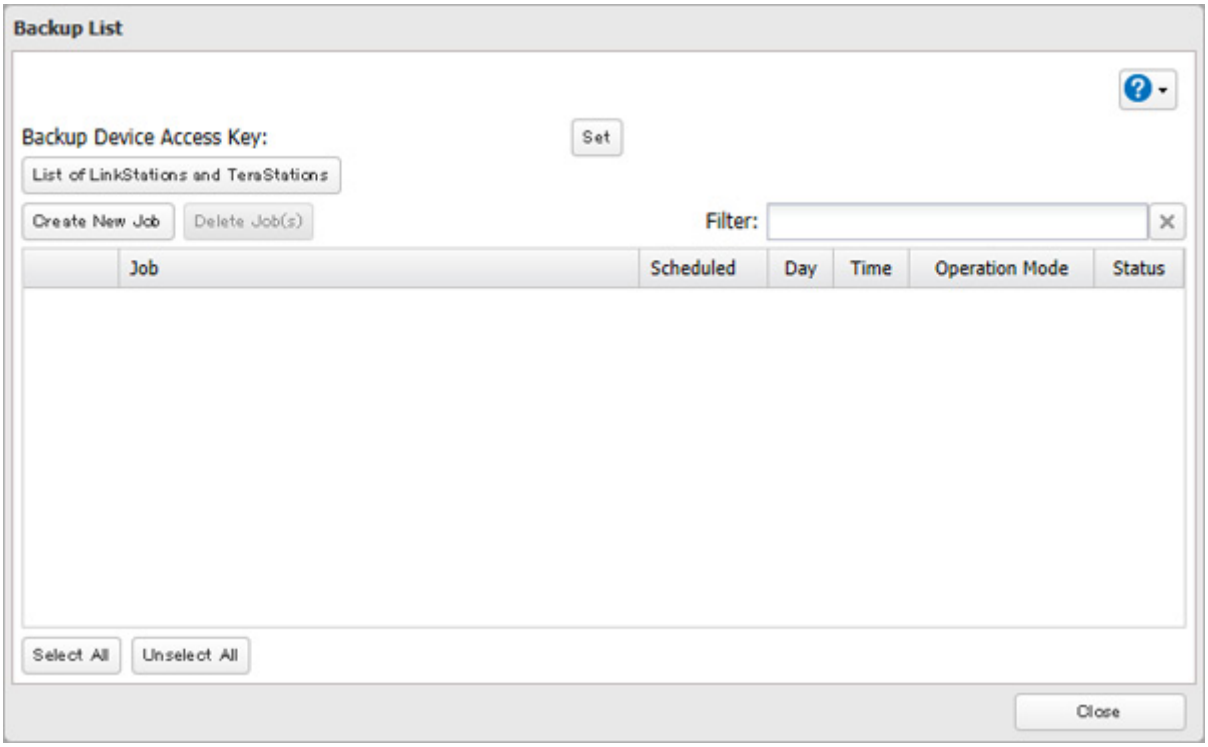
1 In Settings, click *Backup*.



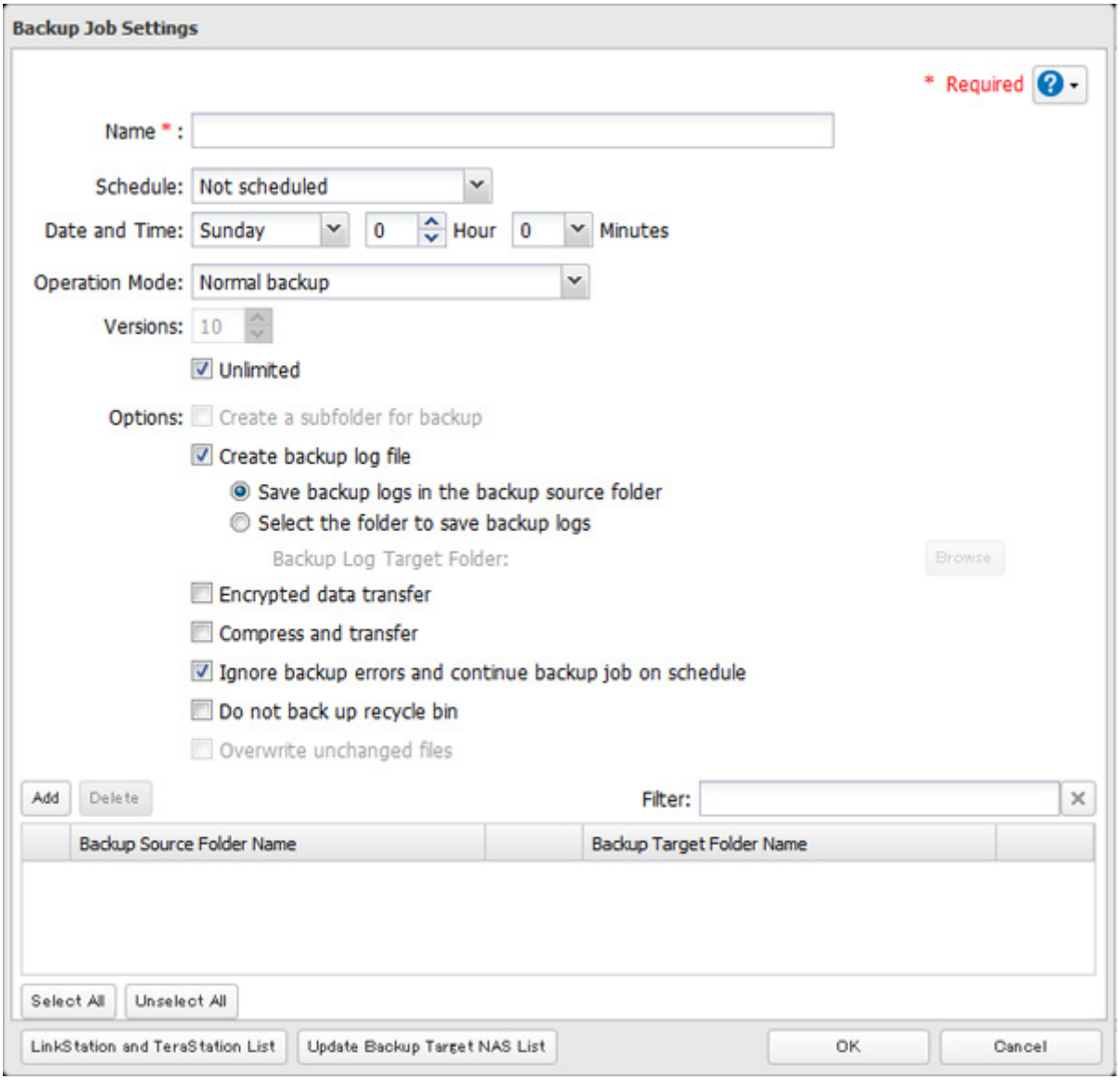
2 Click  to the right of "Backup".



3 Click *Create New Job*.



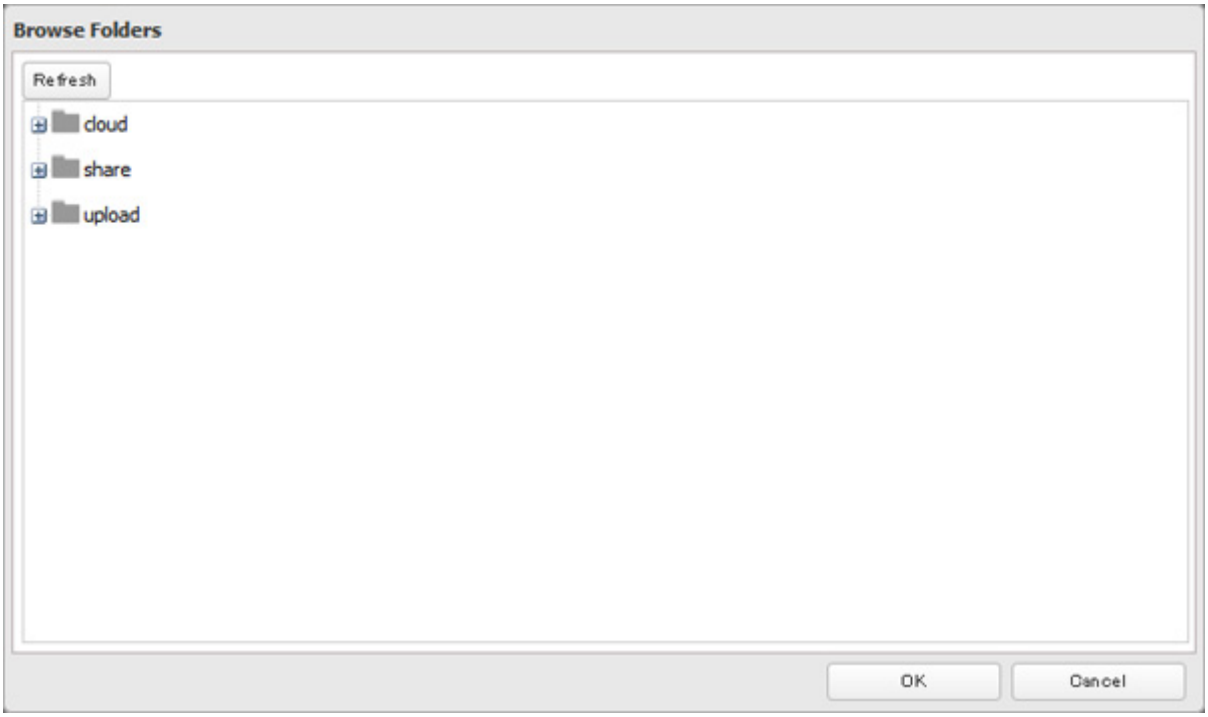
4 Select backup settings such as date and time to run.



5 Click *Add*.

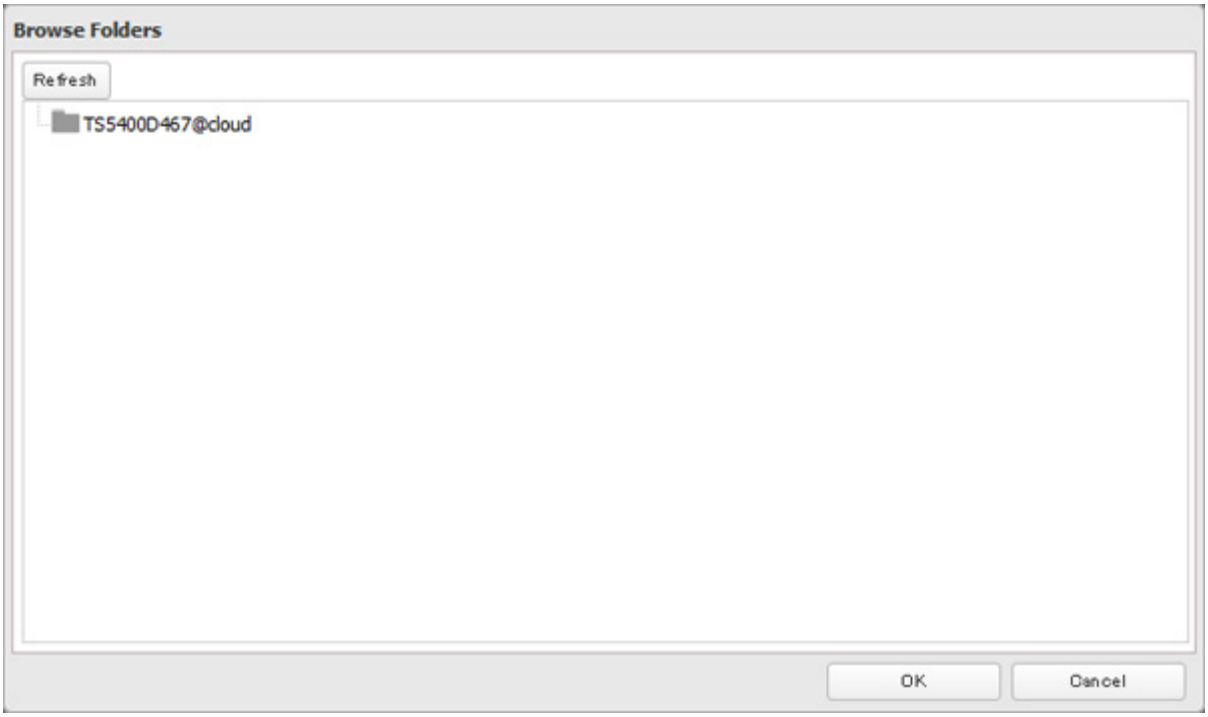
6 Click *Browse* under "Backup Source Folder Name".

7 Select the shared folder that uploaded files will be saved to, then click *OK*.



8 Click *Browse* under "Backup Target Folder Name".

9 Select the shared folder created from the "Configuring Cloud Storage" section above, then click *OK*.



10 Click *OK*. Tasks added to "Backup List" are displayed.

11 Click *Close*.

Notes:

- If a shared folder created through this process is configured to use NFS, it cannot be mounted from an NFS client.
- Files cannot be uploaded to this shared folder using WebAccess.

- If using the cloud storage through a proxy server, click *Proxy Settings*. In the displayed page, enter the proxy server name, port number, username, and password. Ask your network administrator for detailed proxy server settings.
- To use after the network was temporarily disconnected, click *Reconnect*.
- If a file is added to the cloud storage bucket directly, the file will not replicate to the TeraStation's remote replication folder.
- If you enter an incorrect bucket name and then cancel editing the cloud storage service settings, that wrong bucket name may still accidentally be registered. If this happens, reconfigure the cloud storage service settings correctly starting from step 4.
- Be careful with existing files in the destination folder, as files with the same name will be overwritten even if copied files are older.
- If you copy a file to the remote folder using File Explorer or a backup process, the file will also be uploaded sequentially to the cloud storage bucket. This second uploading process will start in the background during the first copying process and will not be visible. If you shut down or restart the TeraStation immediately after copying a file to the remote folder, the file may not be uploaded to the bucket. Try copying the file again if this occurs.
- If you encounter any upload or download errors, click *Error Log*. The log will display the filename and operation during which the error occurred.
- If uploading fails, try copying the file again. If it still fails, click *Reconnect* or set the cloud storage switch to off and on again, then restart the cloud storage service.
- If transferring or accessing 1 TB or more files from cloud storage, make sure there is enough free space on the TeraStation for temporary file caching. For example, when uploading 1 TB of files to cloud storage, it is recommended to keep at least 2 TB of free space available.

Dropbox Sync

The TeraStation supports syncing with Dropbox, the online cloud service. Once connected, you can share TeraStation files via Dropbox (or Dropbox files via TeraStation). To link your TeraStation with your Dropbox account, follow the procedure below.

Note: To use Dropbox Sync, you need a Dropbox account and an available empty Dropbox folder. If you don't have a Dropbox account, or if you need to create a new empty Dropbox folder, refer to the Dropbox website.

Configuring a New Task

1 In Settings, click *Web Services*.

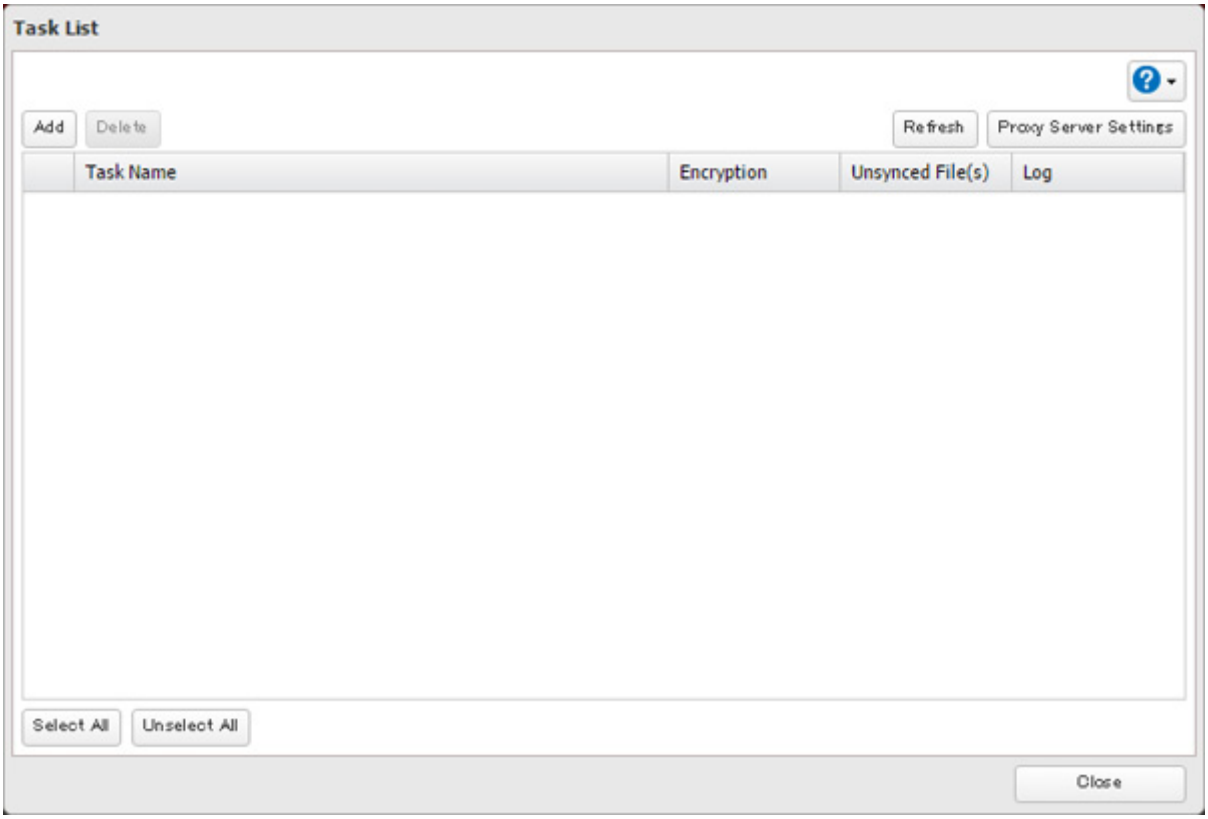


2 Move the Dropbox Sync switch to the  position to enable Dropbox Sync.

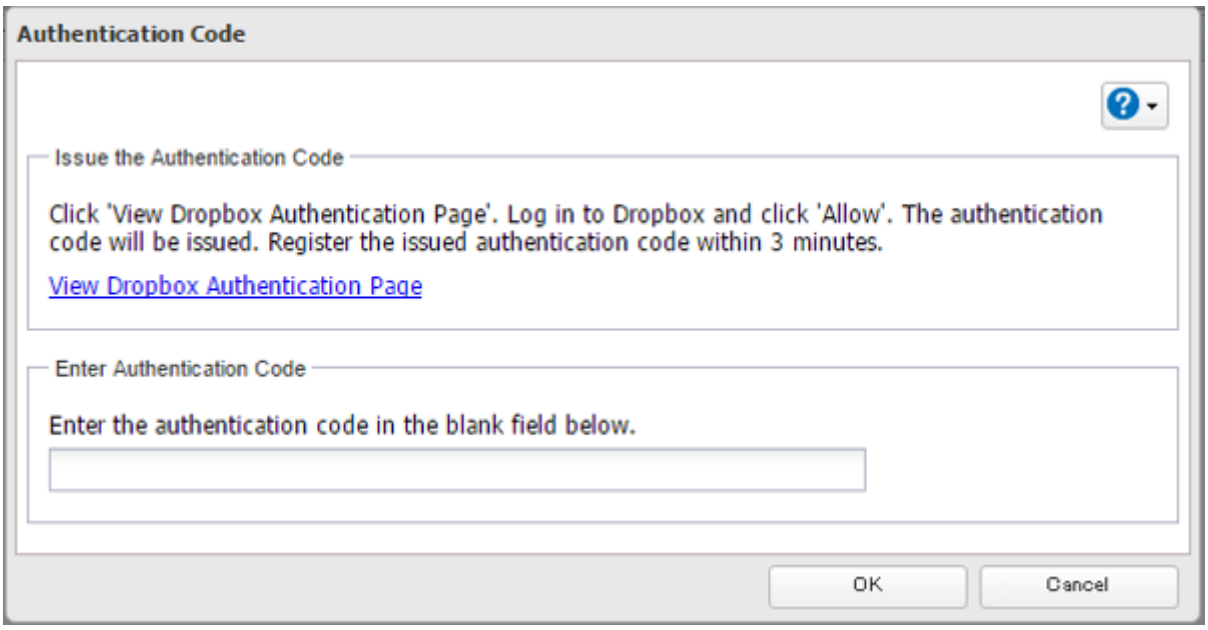


3 Click  to the right of "Dropbox Sync".

4 Click *Add*.



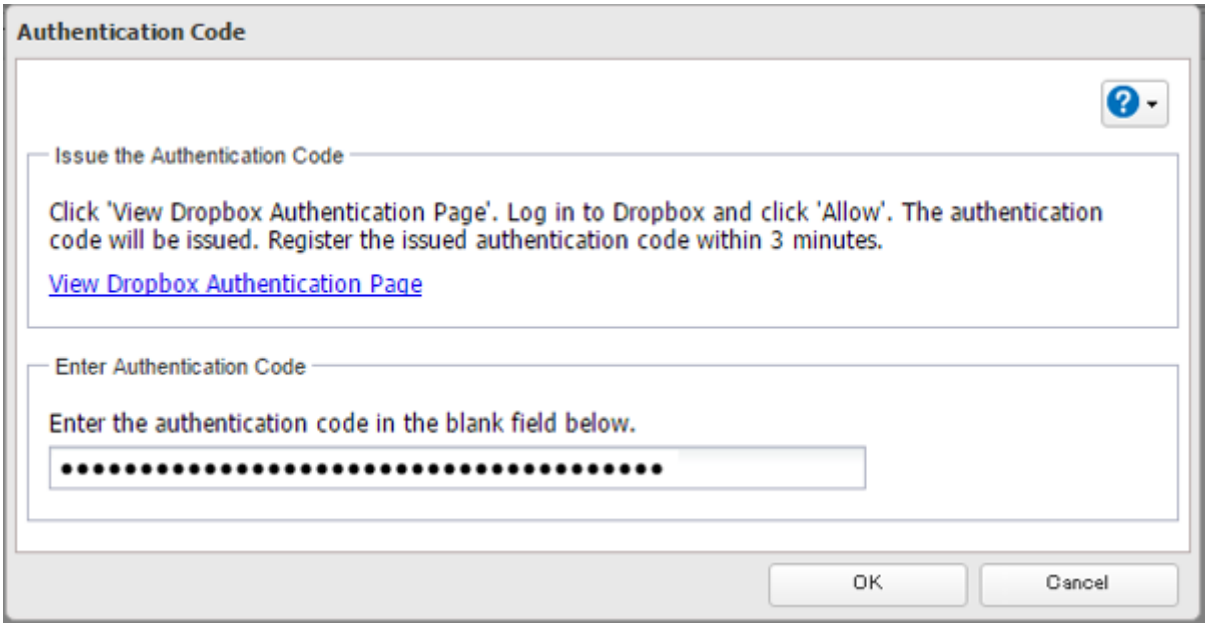
5 Click *View Dropbox Authentication Page*.



6 The authentication site that is offered by Dropbox will be displayed. Log in to the website with your Dropbox account, then click *Allow*.

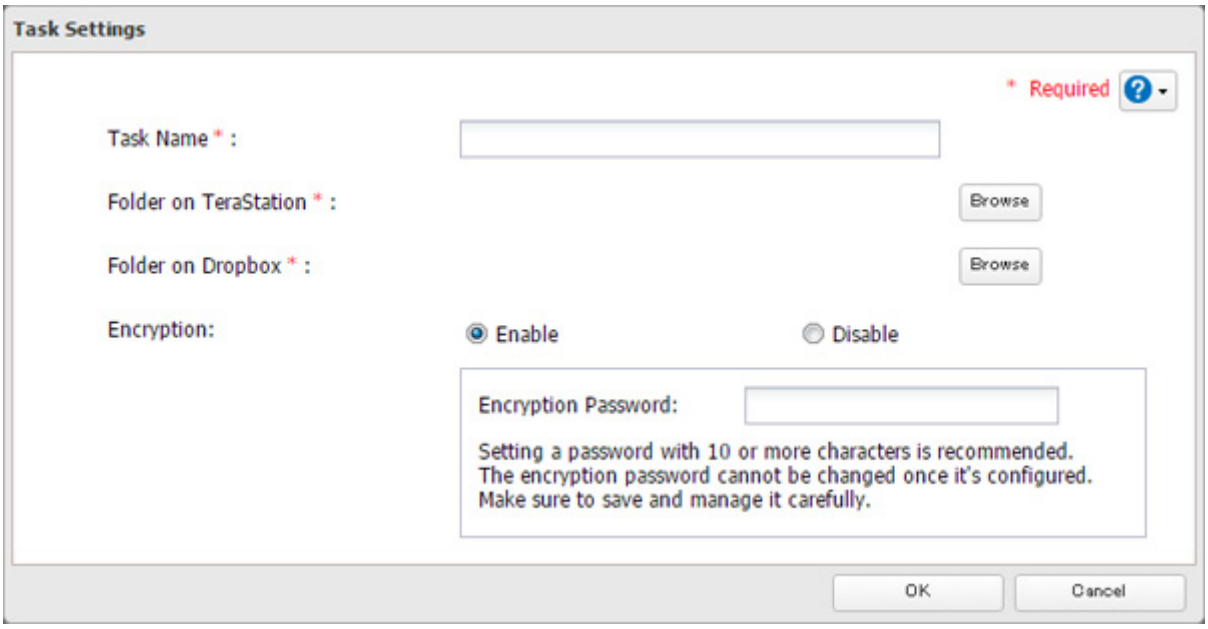
7 The authentication code will be displayed. Copy the authentication code and return to Settings. Authentication code reregistration should be finished within 3 minutes.

8 Paste the authentication code and click *OK*.



9 Enter the desired task name; select the TeraStation and Dropbox folders, and configure encryption. Click *OK*.

If you enable encryption, you will need to set an encryption password. The password cannot be changed once you configure it. Please take note of the password and keep it secure. If you forget the password, create a new task using the same Dropbox account. The old task can then be deleted.



10 Click *OK*.

Changing Dropbox Task Settings

Follow the procedure below to change any task settings you have already configured.

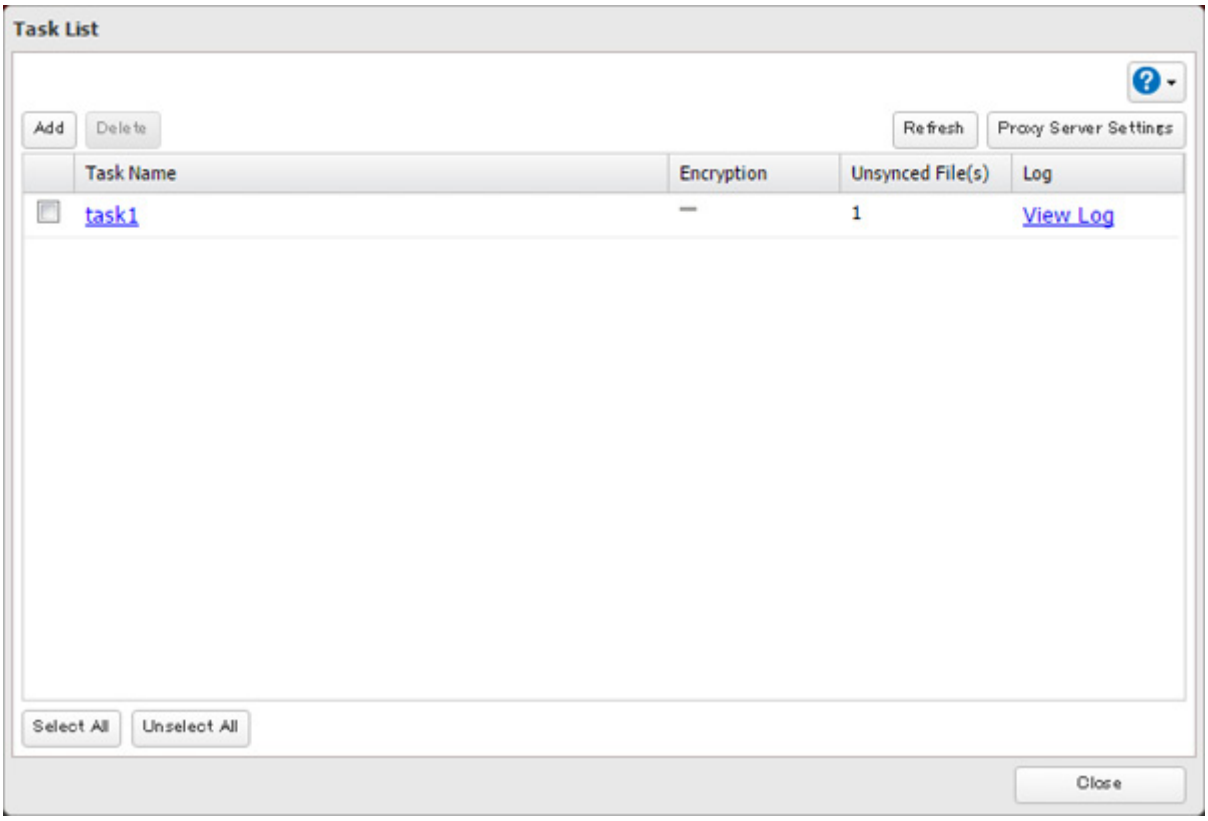
1 In Settings, click *Web Services*.



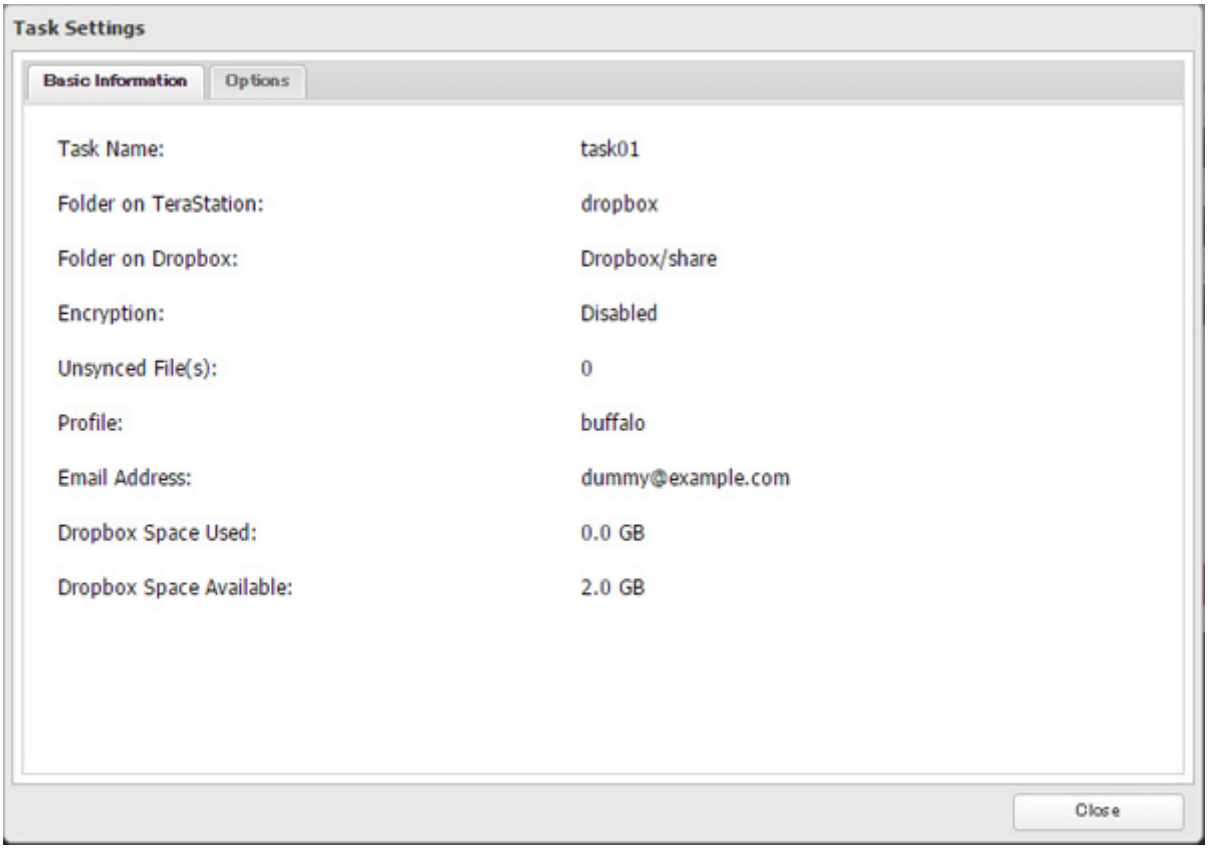
2 Click  to the right of "Dropbox Sync".



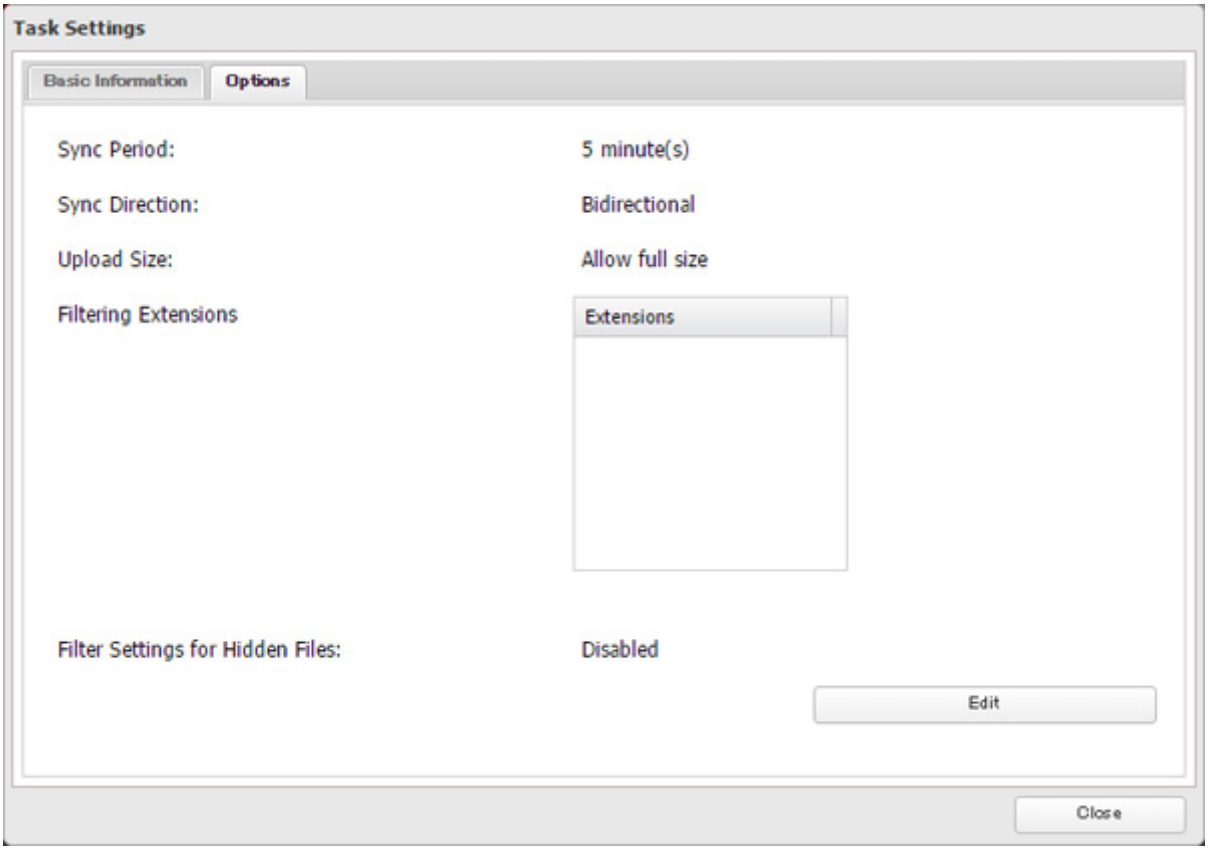
3 From the task list, click the task whose settings you want to change.



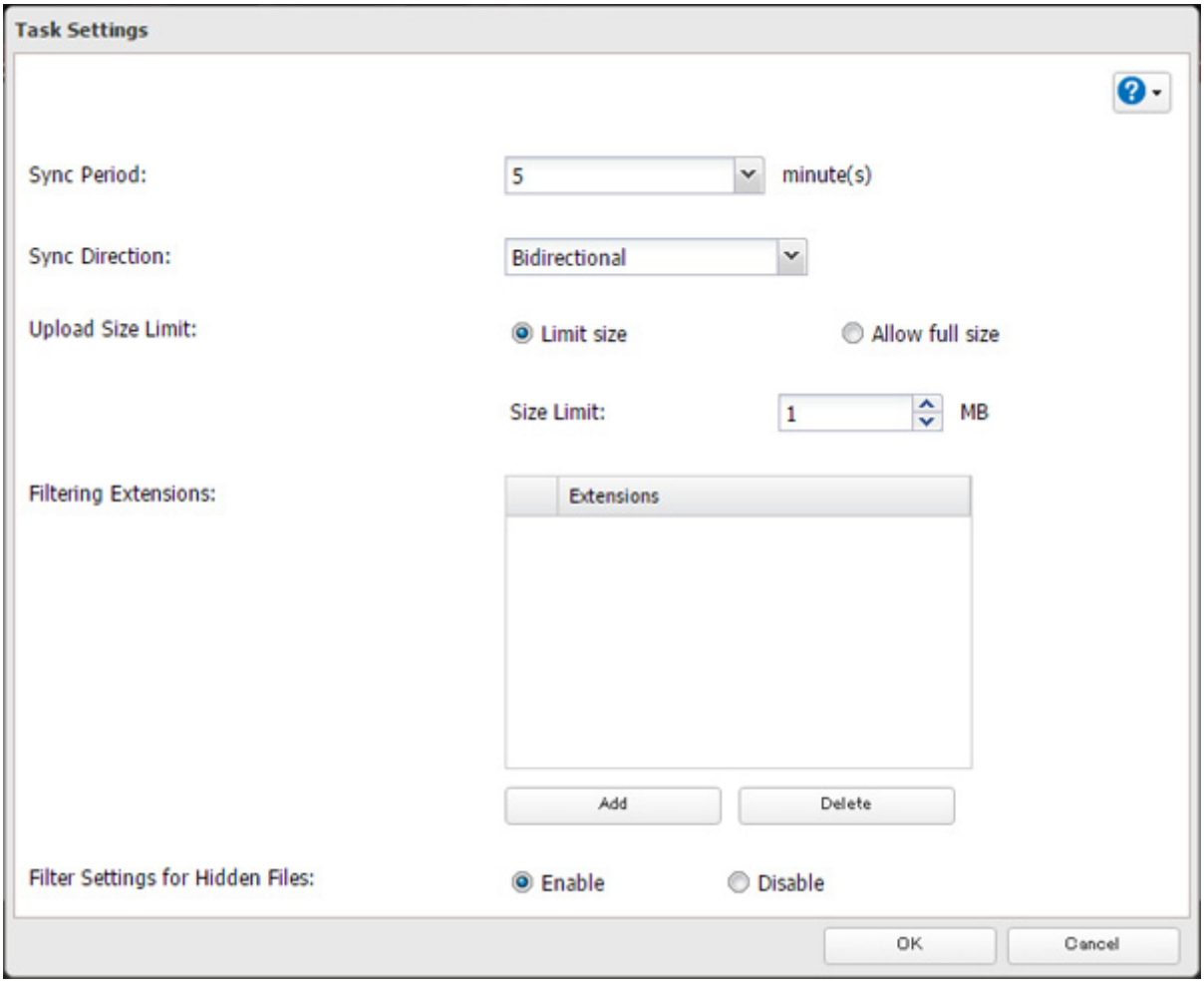
4 Click the *Options* tab.



5 Click *Edit*.



6 Configure the desired settings and click *OK*.



Notes:

- When encryption is enabled, files uploaded to Dropbox not using Dropbox Sync will not be downloaded to the TeraStation even if the sync direction is configured to "Bidirectional" or "Download only".
- Refer to the following website for synchronization restrictions between the TeraStation and Dropbox: https://www.dropbox.com/help/145
- Folders that are configured for Dropbox Sync cannot be renamed or used for replication.
- When specific settings are changed, the changes are not applied and the files on Dropbox may not be synced to the TeraStation. In such a case, delete the target files to be synced and upload them to Dropbox again or delete the task and recreate it again. The following are the specific circumstances when files may not be synced:
  - When uploading or downloading fails.
  - When file extensions are removed from filtering.
  - When the sync direction is changed.

Creating a Shared Link (Windows Only)

Buffalo offers a Windows application, "B-Sync", that can create shared links for the files stored in the TeraStation folders. You can download the application from the Buffalo website. Refer to the application help for the usage procedure.

Chapter 7 BitTorrent

BitTorrent is a protocol for distributing large amounts of data efficiently. The information in this chapter is for users who are familiar with BitTorrent.

1 In Settings, click *Applications*.

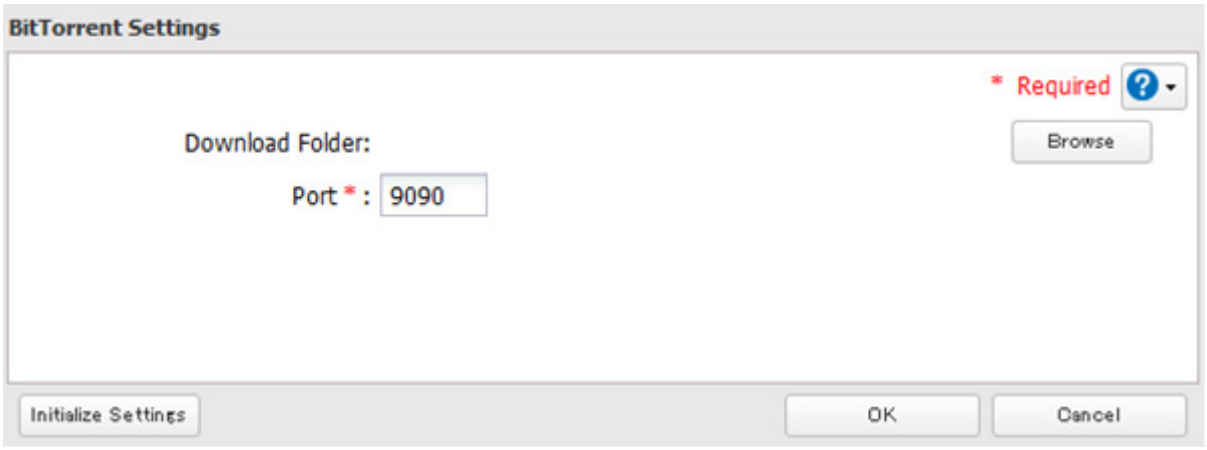


2 Click  to the right of "BitTorrent".

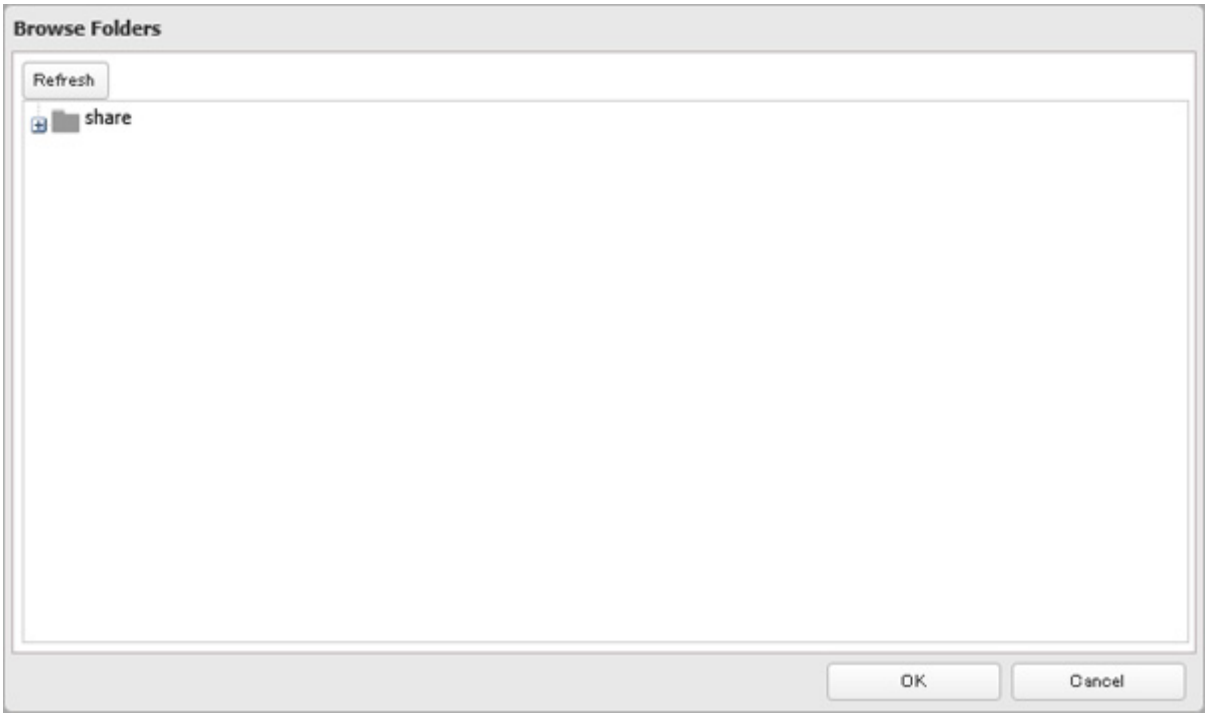


3 Click *Edit*.

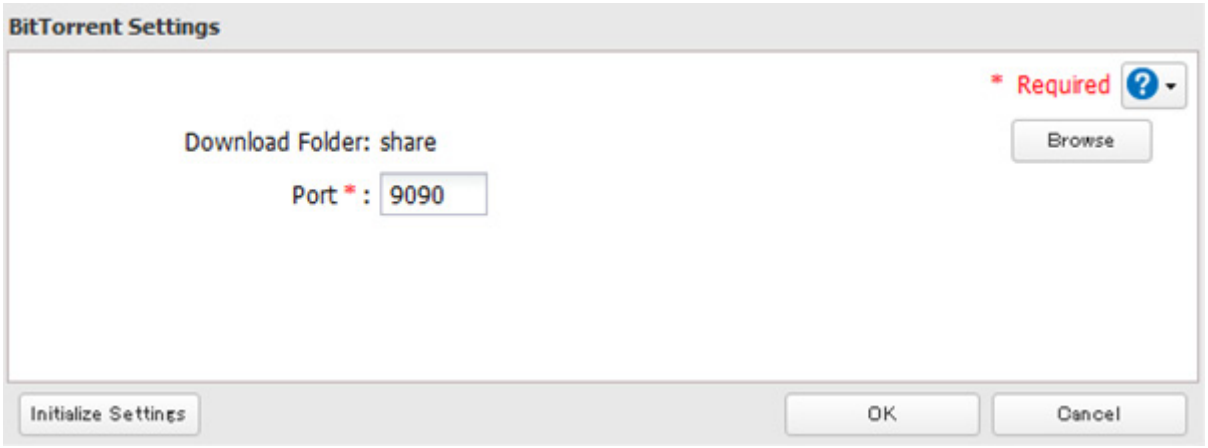
4 Click *Browse*.



5 Select the shared folder where the downloaded file will be saved, then click *OK*.



6 Click *OK*.

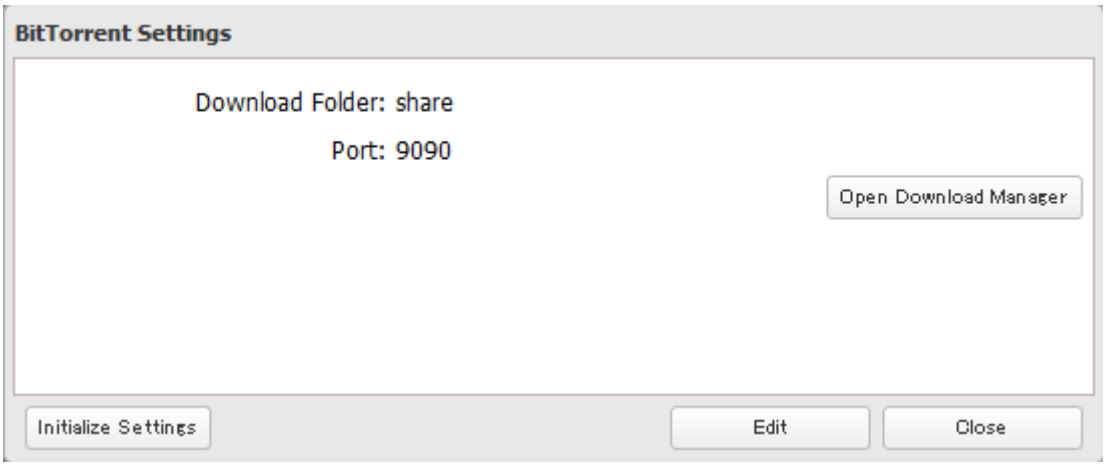


7 Move the BitTorrent switch to the  position to enable BitTorrent.



8 Click  to the right of "BitTorrent".

9 Click *Open Download Manager*. The default username is "admin" and the default password is blank (no password).

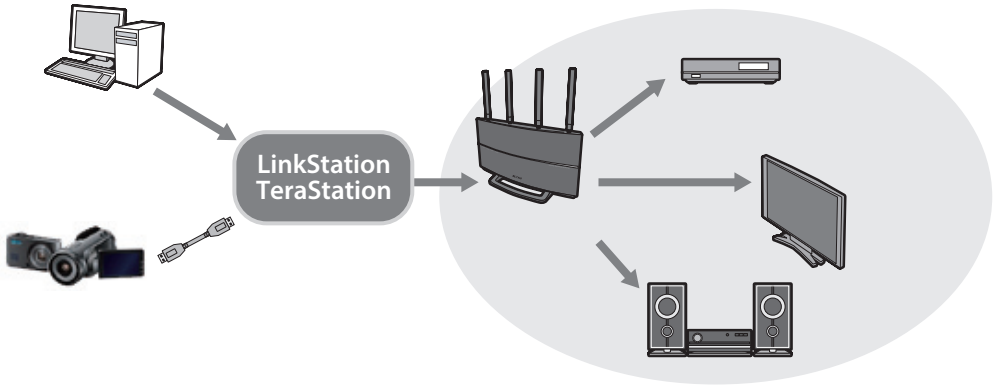


10 The download manager will open.

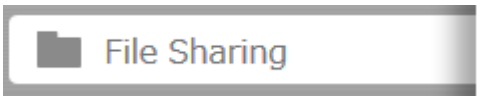
Chapter 8 Multimedia

DLNA

DLNA is a set of guidelines for sharing digital media. The TeraStation includes a DLNA server compliant with the DLNA guidelines. The movies, photos, and music saved on this product can be played back on DLNA-compliant TVs, stereo equipment, game consoles, and other devices within the network.



1 In Settings, click *File Sharing*.



2 Click  to the right of "Folder Setup".



3 Select the folder that you want to share with media players and other DLNA-compatible devices.

4 Click *Edit*.

5 Under "LAN Protocol Support", check "DLNA" and click *OK*.

6 Click *Services*.

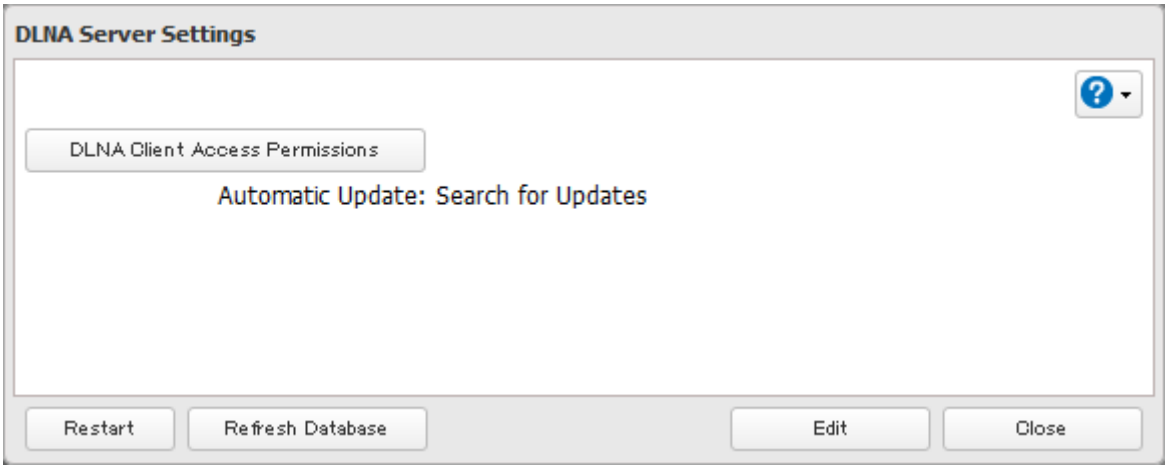


7 Move the DLNA switch to the  position to enable DLNA.

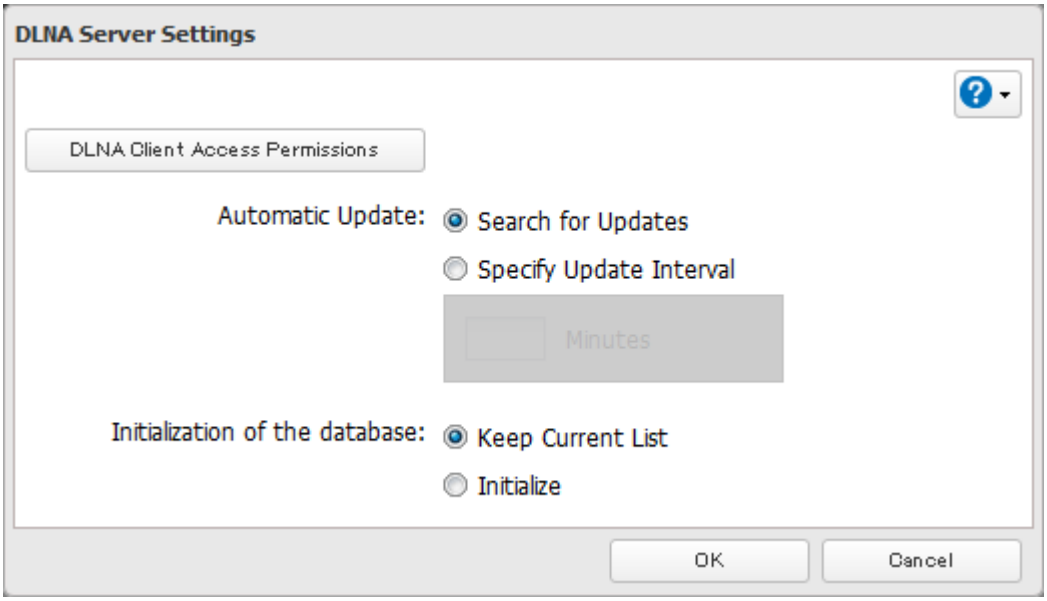


8 Click  to the right of "DLNA Server".

9 Click *Edit*.



10 Select an interval for DLNA server database updates and click *OK*.



11 Click *OK*.

Playing Files

To play back content from a DLNA-compatible device:

1 Connect the DLNA-compatible device to the same network as the TeraStation and turn it on.

2 Select the TeraStation in the software of the DLNA-compatible device.

3 Select the content to be played back.

Note: For more information on playing files, see the DLNA-compatible devices' manuals.

Connected DLNA-compatible Devices

Follow the procedure below to view the DLNA-compatible devices connected to your TeraStation.

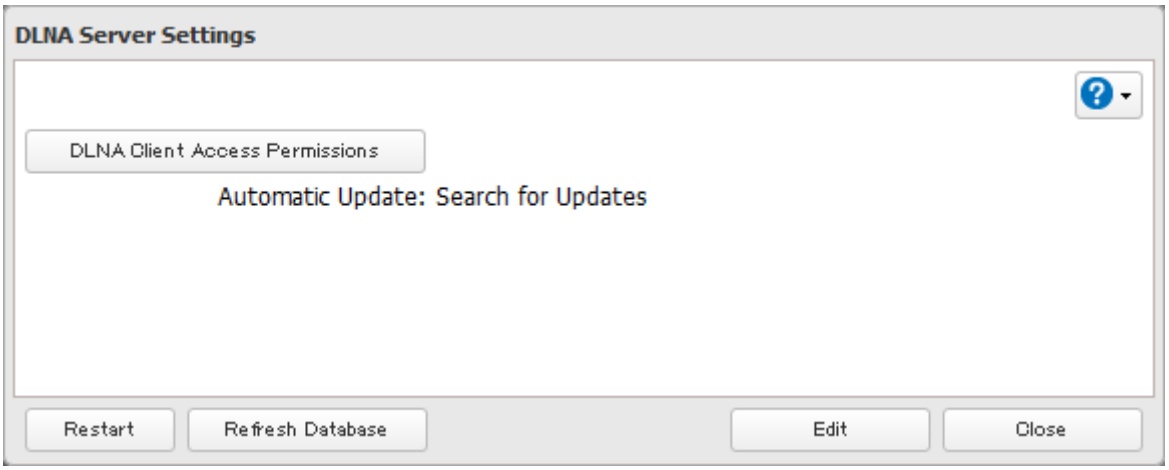
1 In Settings, click *Services*.



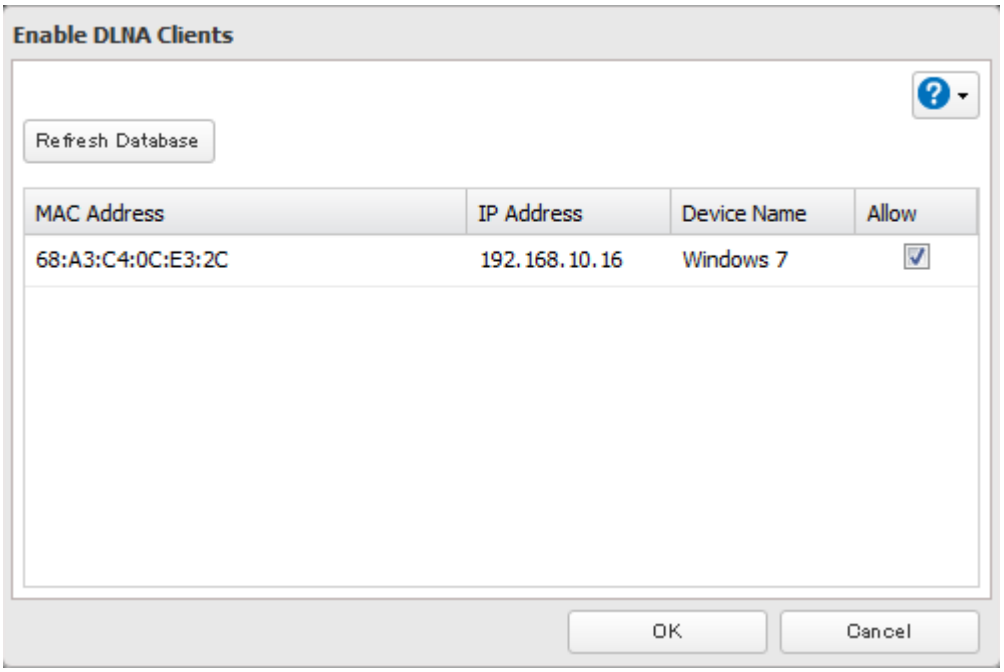
2 Click  to the right of "DLNA Server".



3 Click *DLNA Client Access Permissions*.



4 A list of the MAC addresses, IP addresses, and device names of the DLNA-compatible devices connected to the same network as the TeraStation is displayed. If your device is not listed, click *Refresh Database*.



Streaming to DLNA-compatible Devices

When new movies, photos, and music files are added to the TeraStation's DLNA folder, the database must be updated before the new file can be streamed. By default, the database is updated at startup and again every 60 minutes. You can change this interval or update the database manually.

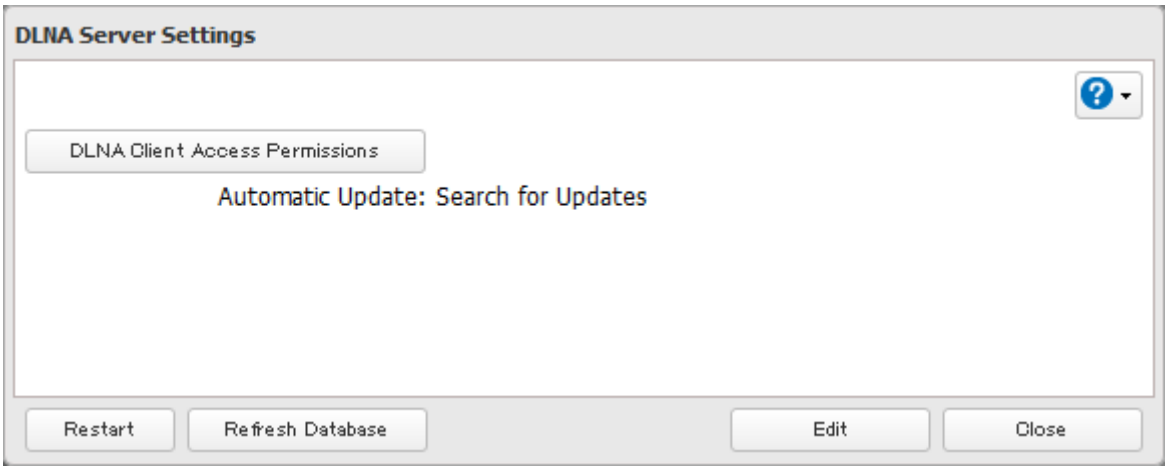
1 In Settings, click *Services*.



2 Click  to the right of "DLNA Server", then click *Edit*.



3 You may change the update interval, or select *Refresh Database* to update the database immediately.



Disabling Playback from Specific Devices

You may block specific DLNA devices from playing back media content.

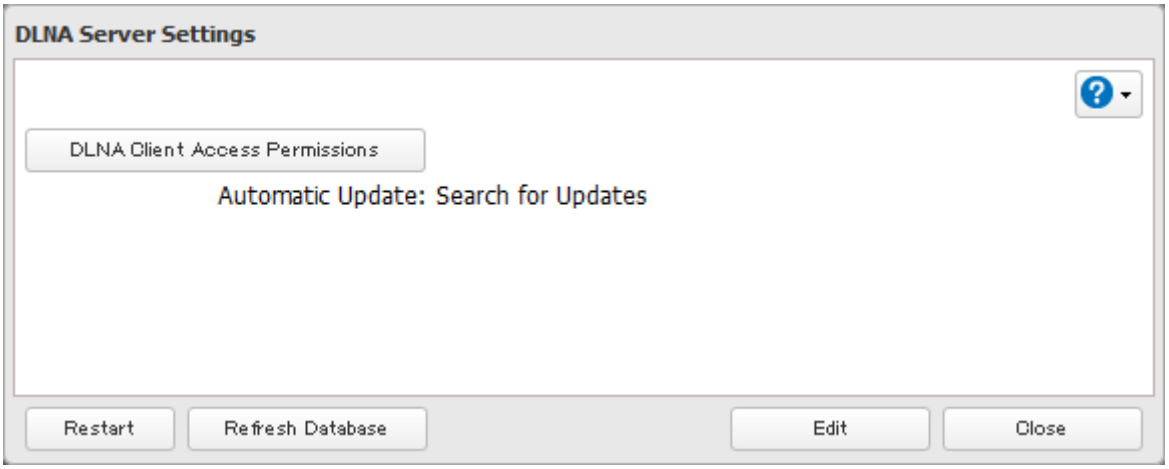
1 In Settings, click *Services*.



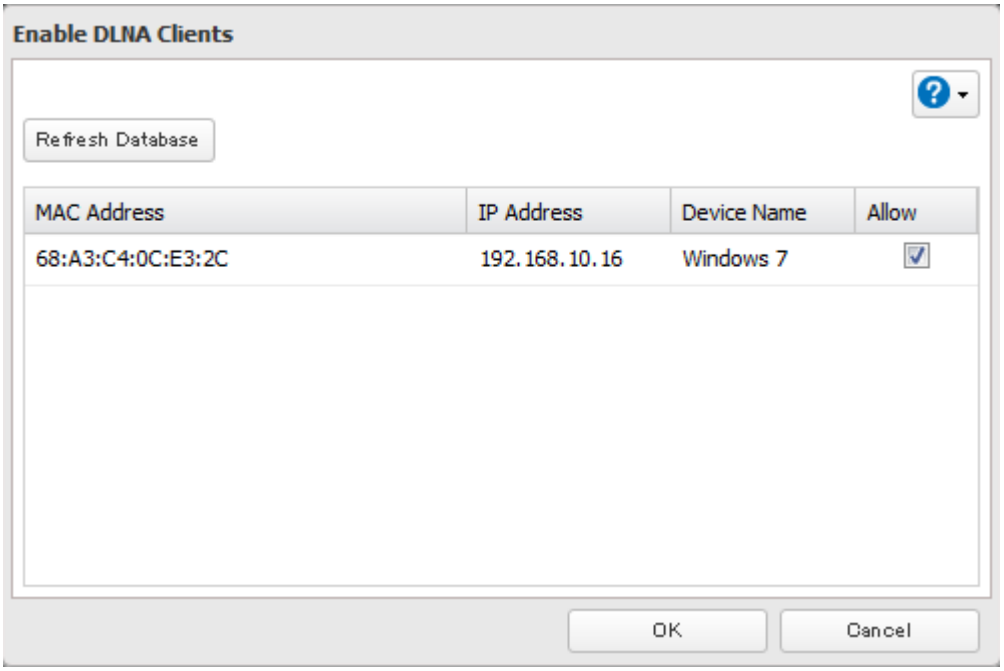
2 Click  to the right of "DLNA Server".



3 Click *DLNA Client Access Permissions*.



4 Uncheck the devices you do not want to allow to play media and click *OK*.



Supported File Types

The TeraStation supports DLNA streaming of files with the extensions below.

Types	File Extensions
Video files	.avi, .divx, .asf, .mpg, .mpe, .m1v, .vob, .mts, .m2ts, .m2t, .mpeg, .mpeg2, .vdr, .spts, .tp, .ts, .3gp, .mov, .m4v, .wmv, .dvr-ms, .xvid, .mp4, .m4v
Picture files	.jpg, .jpeg, .gif, .png, .tif, .tiff, .yuv, .bmp
Music files	.mp3, .mpa, .wma, .aac, .apl, .ac3, .lpcm, .pcm, .wav, .m3u, .m4a, .mp4, .3gp, .m4b, .aif, .aiff, .flac, .ogg, .mp2, .mp1, .mp4

iTunes Server

If iTunes server is enabled, computers on your network with iTunes can play music files stored on the TeraStation and transfer them to iPod, iPhone, and iPad devices. iTunes server supports playback from up to five computers.

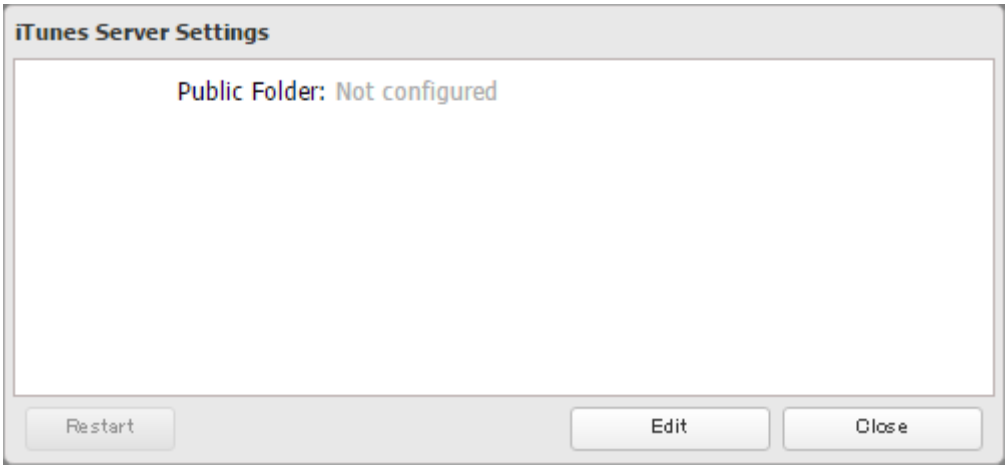
1 In Settings, click *Services*.



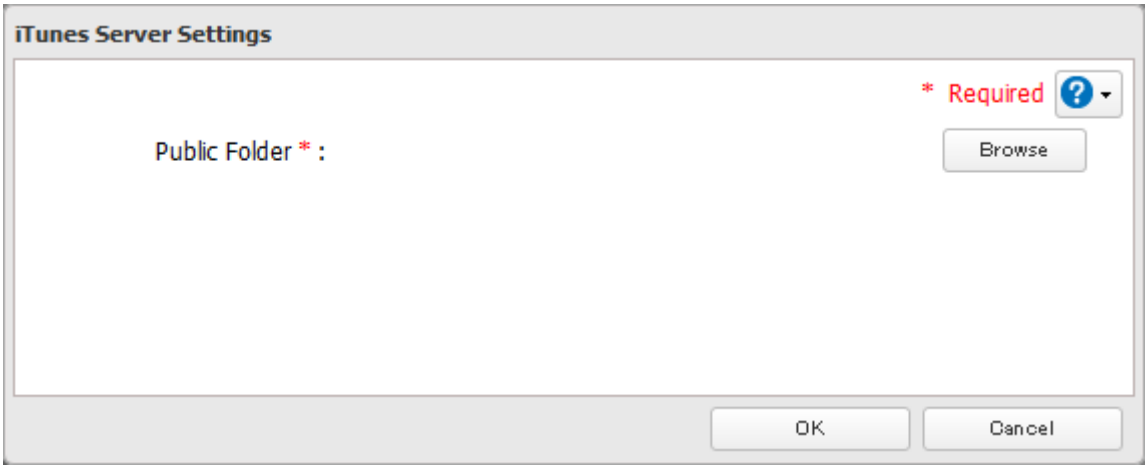
2 Click  to the right of "iTunes Server".



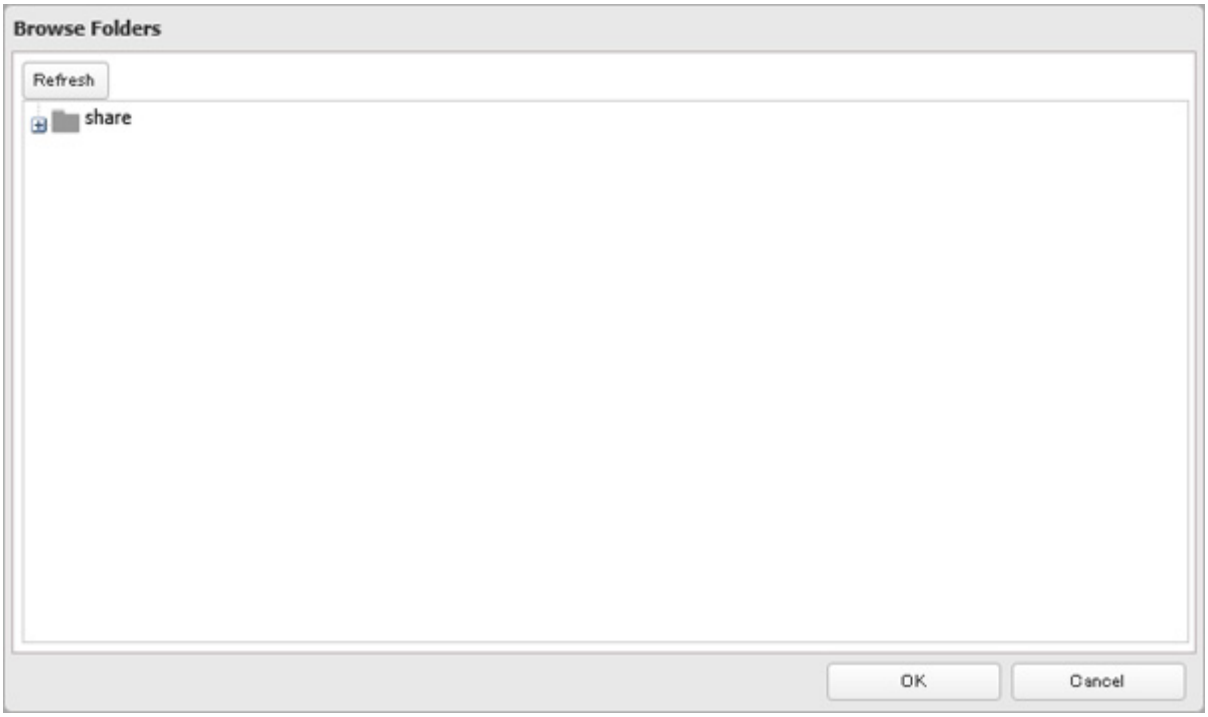
3 Click *Edit*.



4 Click *Browse*.



5 Select the shared folder that you want to make available to iTunes, then click *OK*.



6 Click *OK*, then *OK* again.

7 Move the iTunes server switch to the position.



Squeezebox Server

Squeezebox is a network music player by Logitech that can play back music stored on your network using your wired or wireless LAN without a computer. Squeezebox supports mp3, flac, ogg, he-aac v2 and wma.

Configuration

1 In Settings, click *Services*.



2 Move the Squeezebox server switch to the position to enable Squeezebox server.

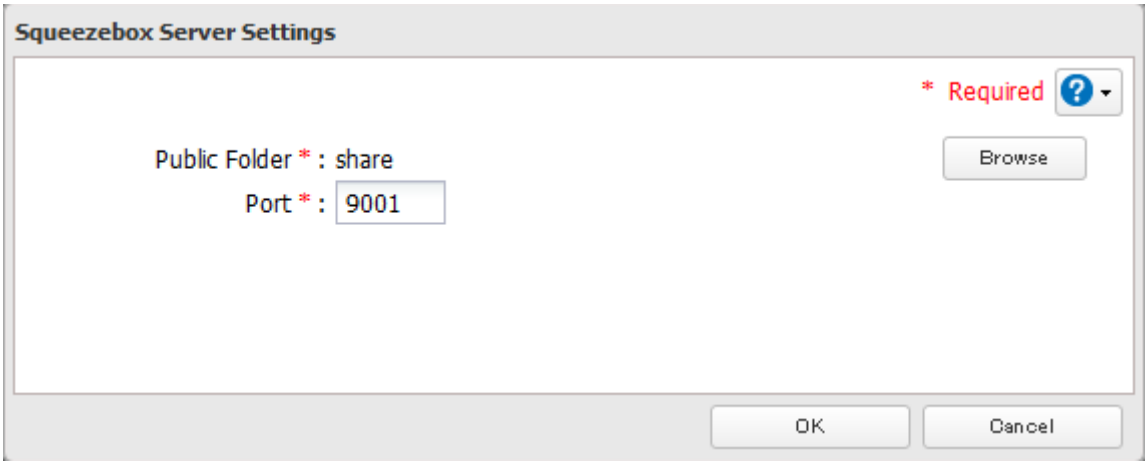


3 Click to the right of "Squeezebox Server".

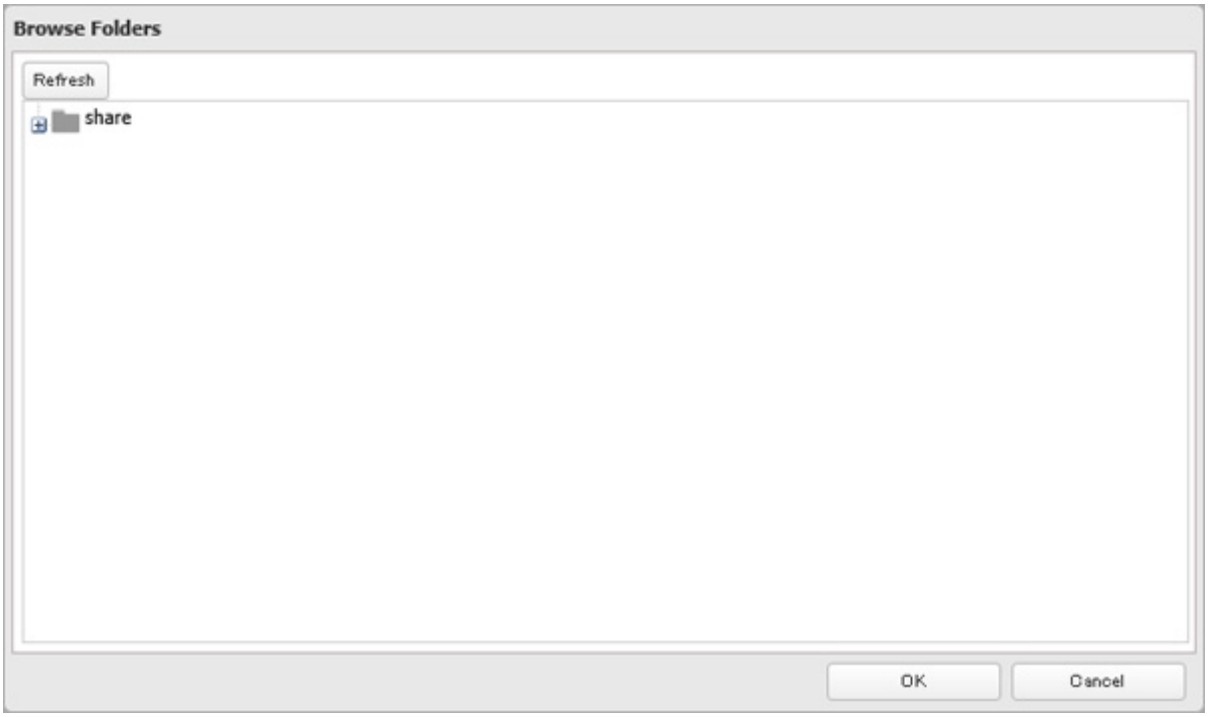
4 Click *Edit*.



5 Click *Browse*.



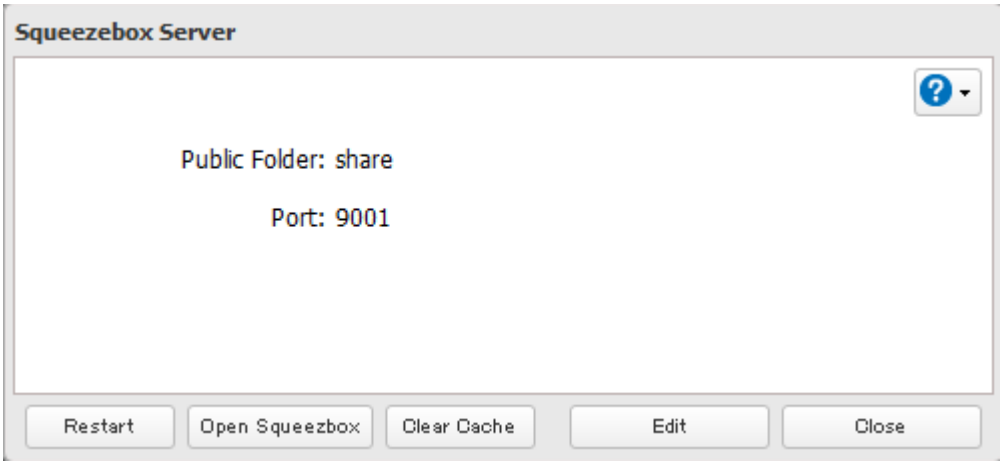
6 Select the shared folder that you want to make available to Squeezebox, then click *OK*.



7 Enter port number (9001 is recommended), then click *OK*.

8 Click *OK*.

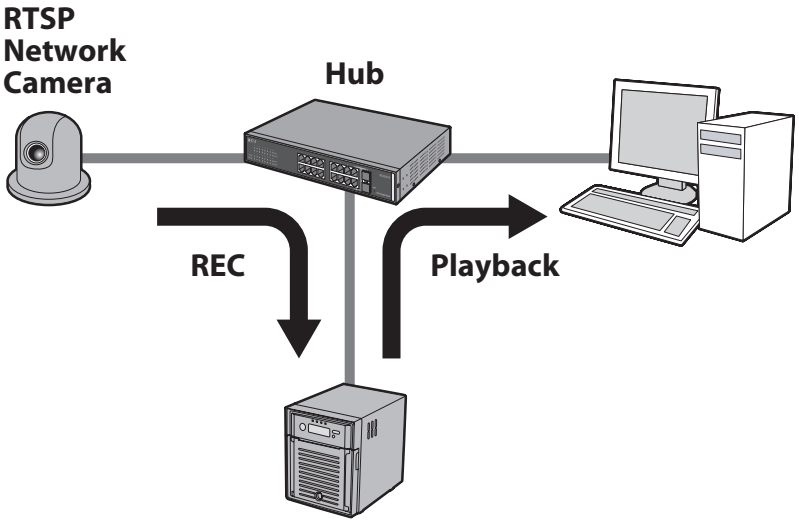
9 Click *Open Squeezebox*.



The Squeezebox's settings will open.

Chapter 9 Surveillance Server

The TeraStation supports streaming video from RTSP (Real Time Streaming Protocol) network cameras.



Getting Started

The following items are required:

- TeraStation with surveillance camera support
- Supported network camera
- Ethernet cable
- Ethernet hub
- Computer

  Supported operating systems: Windows 8.1 (64-bit or 32-bit)*, Windows 8 (64-bit or 32-bit)*, Windows 7 (64-bit or 32-bit), Windows Vista (64-bit or 32-bit), Windows XP SP3, Windows Server 2008 SP2 (64-bit or 32-bit), Windows Server 2003 SP2, OS X 10.5.8 or later

  CPU: Intel dual-core 2.20 GHz or faster

  Hard drive: 10 GB or more of available space

  RAM: 2 GB or more

  Computer requirements for Live Viewer are below:

  Supported operating systems: Windows 8.1 (64-bit or 32-bit)*, Windows 8 (64-bit or 32-bit)*, Windows 7 (64-bit or 32-bit), Windows Vista (64-bit or 32-bit), Windows XP SP3

  CPU: Quad-core 2.33 GHz or faster

  Hard drive: 10 GB or more of available space

  RAM: 2 GB or more

* Log in to Windows with a local admin account, not a Microsoft account. If you log in with a Microsoft account, you will not be able to access the surveillance server on the TeraStation.

Installing Client Tools

Download "Buffalo Surveillance Camera Client Tools Setup" from the Buffalo website and install the following client tools using the install wizard on your computer.

Camera Policies - Registers that a network camera is connected and ready to record.

Live Viewer - Lets you view video as it is being recorded. With some network cameras, pan, tilt, zoom, focus, and other remote operations may be unavailable.

Data Service Policies - Used to move, back up, and delete recorded video data.

Vault Admin - Used to perform license registration, self-diagnosis, check the remaining disk space, and other operations.

Surveillance Video Manager - Used to view recorded video data, perform searches, export, and other operations.

Network Activity - Displays the operating status of the TeraStation.

Notes:

- Install after logging into your computer using an account with administrator rights.
- Install another media player to play recorded videos if the version of "Buffalo Surveillance Camera Client Tools Setup" is 5.7.3.2 or later.
- Install VideoLAN VLC media player 1.11–1.13, or Apple QuickTime 7 or later if the version of "Buffalo Surveillance Camera Client Tools Setup" is older than 5.6.19.3. VLC media player 2.0.x may not work with some network cameras. Using VLC media player is recommended if your network camera records in MPEG-4 format.
- If VLC media player is installed, use the default installation location (C:\Program Files (x86)\VideoLAN\VLC in Windows 7 64-bit or the Application folder in macOS).
- If surveillance cameras or client tools installed under C:\Program Files (x86)\BUFFALO\SurveillanceServer\Bin are blocked due to the OS firewall, refer to the OS help for procedure about how to disable the firewall.
- Install client tools on one or more computers connected to the same network as the network camera(s) and the TeraStation. Surveillance camera settings are shared for all computers on the network.

Connecting Devices to the Network

Connect the following devices to the network.

- A TeraStation that supports surveillance cameras
- A compatible network camera
- A computer with the above client tools installed

Notes:

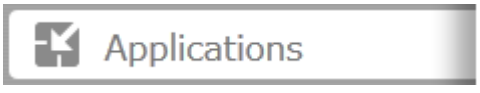
- Connect all devices on the same network subnet.
- Set the TeraStation's and network camera's time settings to the correct time. To select a different NTP server on the TeraStation, refer to "Name, Date, Time, and Language" section in chapter 10.
  In certain cases, the DNS server address must be set in order to access the NTP server.
- Use the dedicated utility provided with the network camera or other program to confirm that the network camera is operating properly.

Enabling Surveillance Cameras

Enable surveillance cameras in Settings.

Note: First, complete the initial settings for the TeraStation and the network camera. For details on the procedure, see the manual supplied with the device.

1 In Settings, click *Applications*.

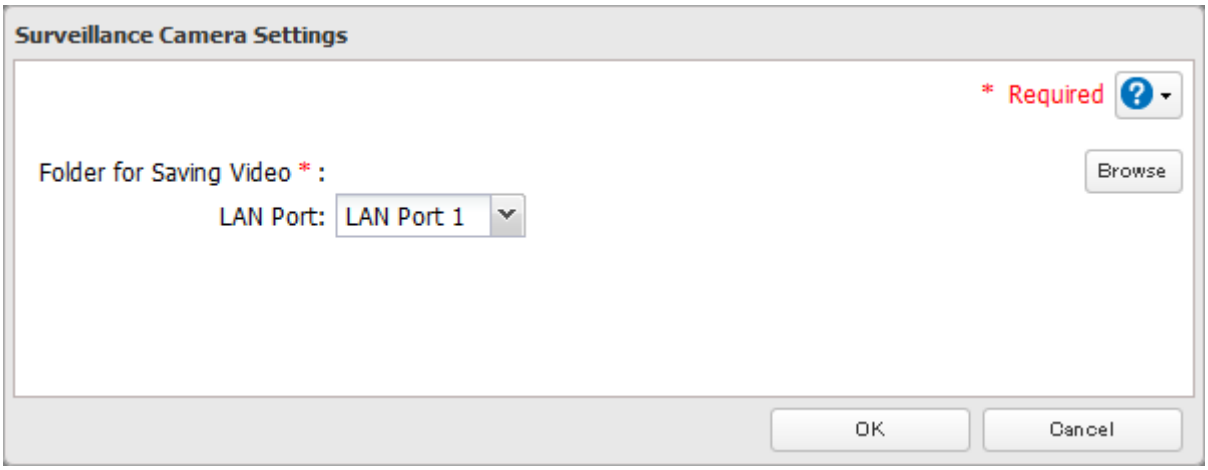


2 Click  to the right of "Surveillance Cameras".



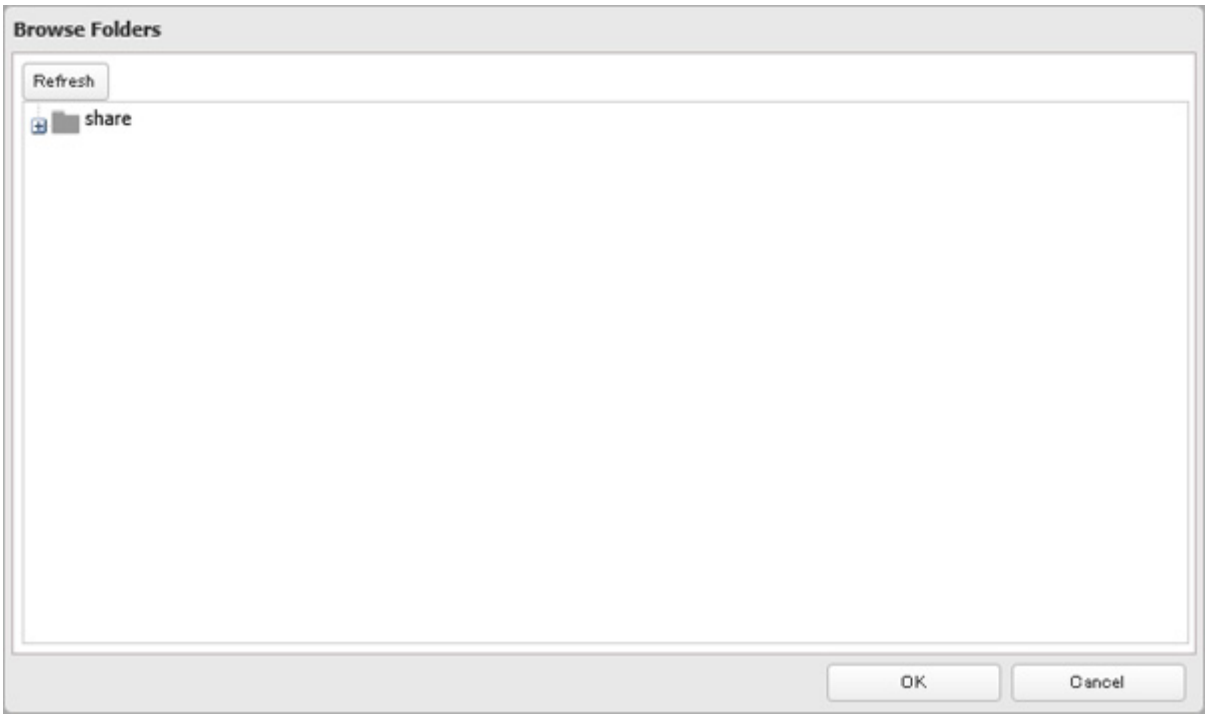
3 Click *Edit*.

4 From "LAN Port", select the LAN port connected to the same network as the network camera and computer where the client tools are installed.



5 Click *Browse*.

6 Choose a folder for recorded video, then click *OK*.



Note: Use a folder with 201 GB or more available space.

7 Click *OK*.

8 Click *OK*.

9 Move the surveillance camera switch to the  position.



Notes:

- If the target shared folder specified as the storage location for recorded video is deleted, the surveillance camera is automatically disabled.

- Do not directly edit recorded video data in the shared storage folder. If a file is directly edited, the surveillance camera may no longer operate properly.
- Do not duplicate or back up the recorded videos with the backup or replication functions in the TeraStation's Settings. A separate backup license must be purchased to back up this data to another TeraStation.
- The client tools can only be used with the LAN connected to the selected LAN port.
- Failover and surveillance cameras are not compatible. Therefore surveillance cameras cannot be used if failover is configured. Conversely, failover cannot be used if surveillance camera functionality is enabled.

Use with Two or More Network Cameras

In the default settings, only one network camera can be used. To use two or more network cameras, additional licenses (sold separately) must be purchased and registered. For more details to add licenses and registration, see the "Activating Additional Licenses" section.

Enabling the Free License

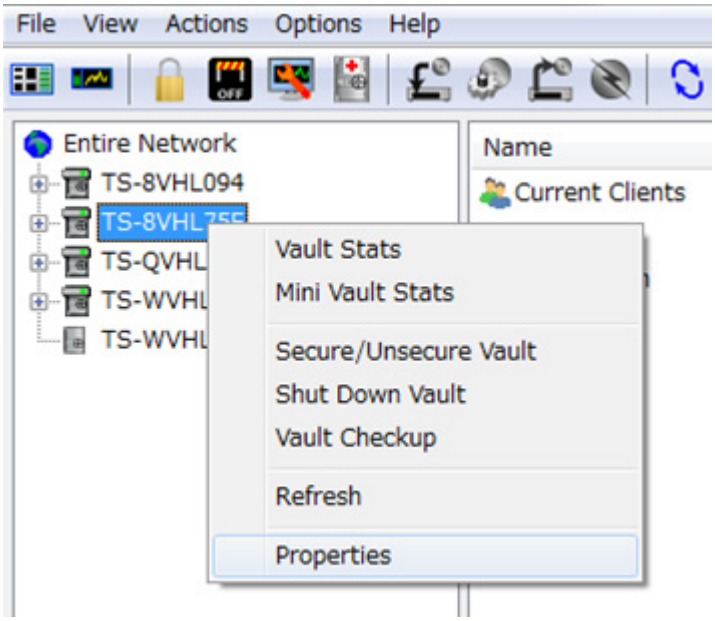
Your TeraStation comes with a license for one surveillance camera. Follow the procedure below to enable the included license.

Note: If port trunking is enabled, the free license cannot be activated. To activate the license, disable port trunking, then follow the procedure below.

1 Connect the TeraStation to the Internet.

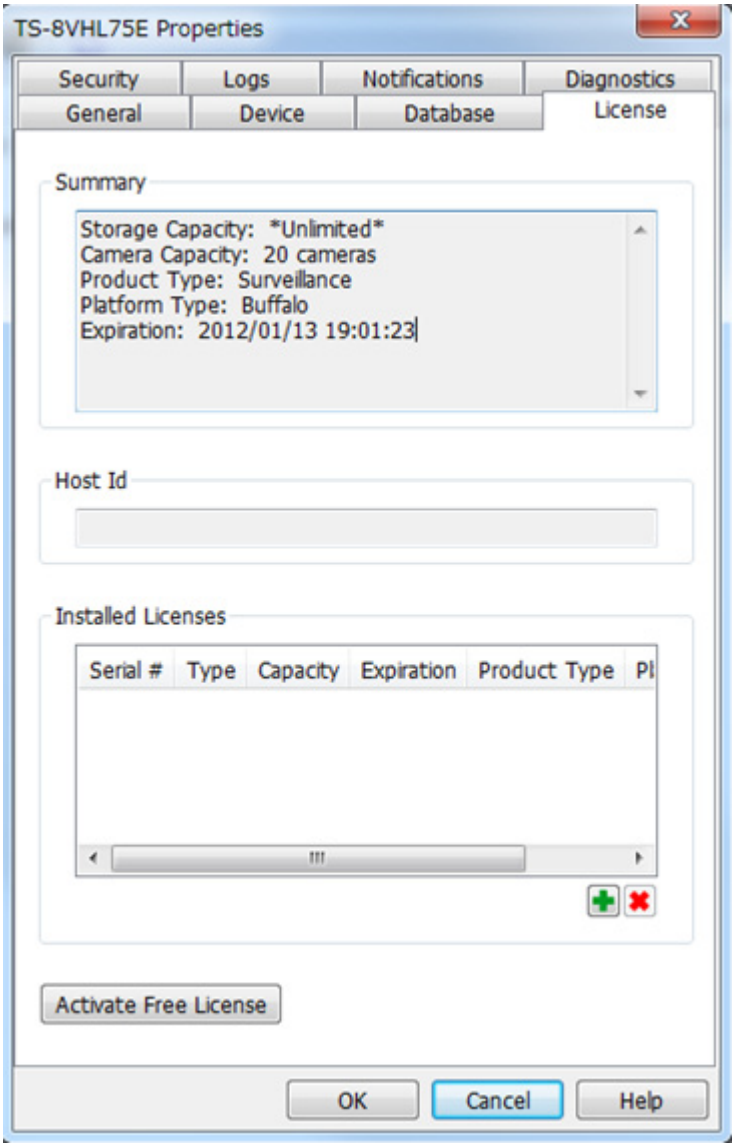
2 Click *Start - BUFFALO - BUFFALO Surveillance Server - Vault Admin*.
For Windows 8.1 and Windows 8, click *Vault Admin* in the Start menu.

3 Select the TeraStation where you want to add the license, right-click it, and click *Properties*.



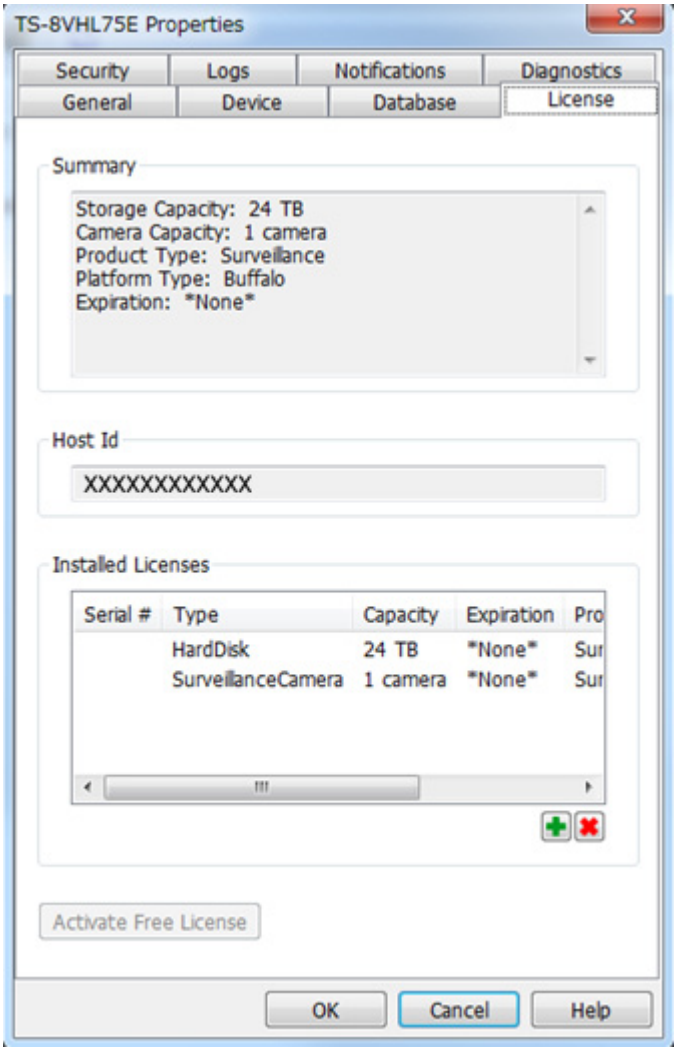
Note: If your computer joins a Public network, the TeraStations may not be detected. In such case, let the computer joins a Home or Work network.

4 Open the *License* tab, then click *Activate Free License*.



To deactivate the license, click .

5 Make sure that "SurveillanceCamera" and "HardDisk" were added to "Installed Licenses".



The free license is now enabled.

Registering Recording Policies

Register the network camera that is used.

1 Click *Start - BUFFALO - BUFFALO Surveillance Server - Camera Policies*.

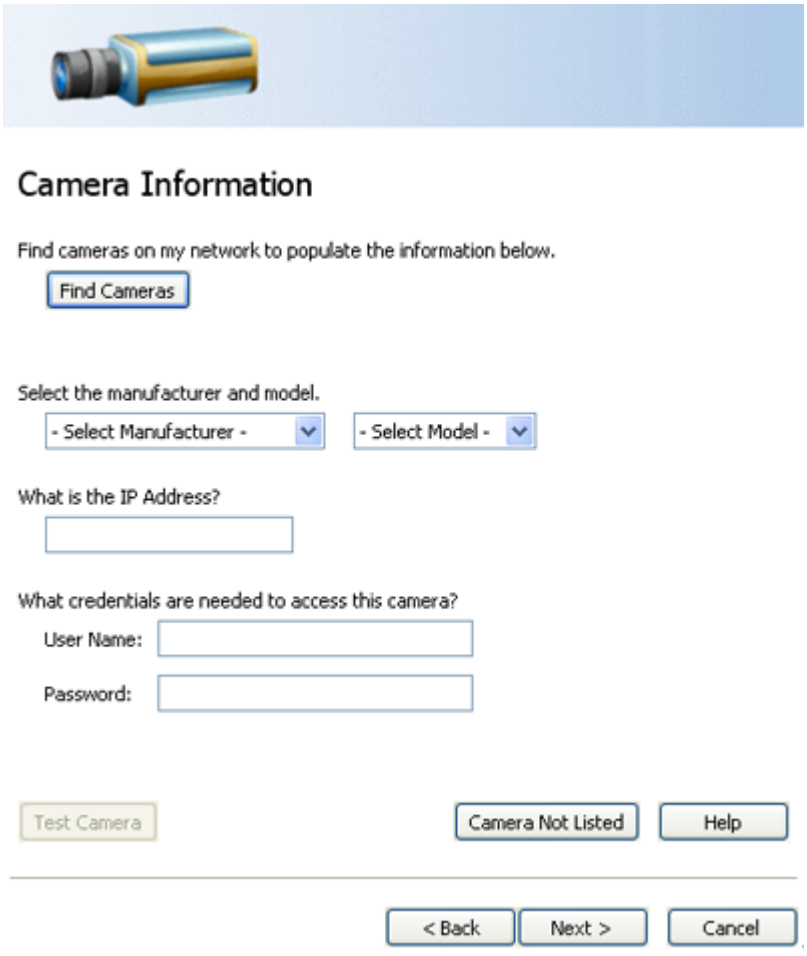
For Windows 8.1 and Windows 8, click *Camera Policies* in the Start menu.

2 Click the  icon.

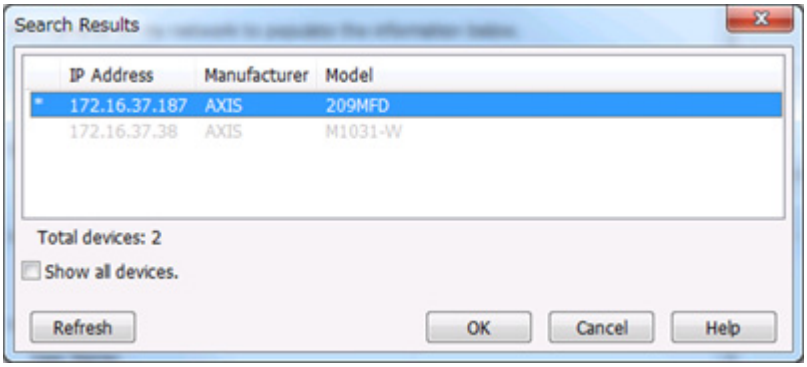
3 Click *Next*.



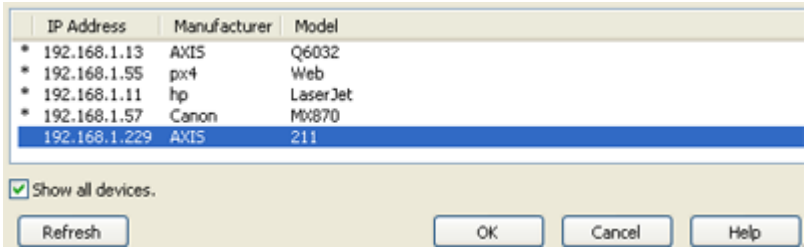
4 Click *Find Cameras*.



5 Select the detected network camera, then click *OK*.



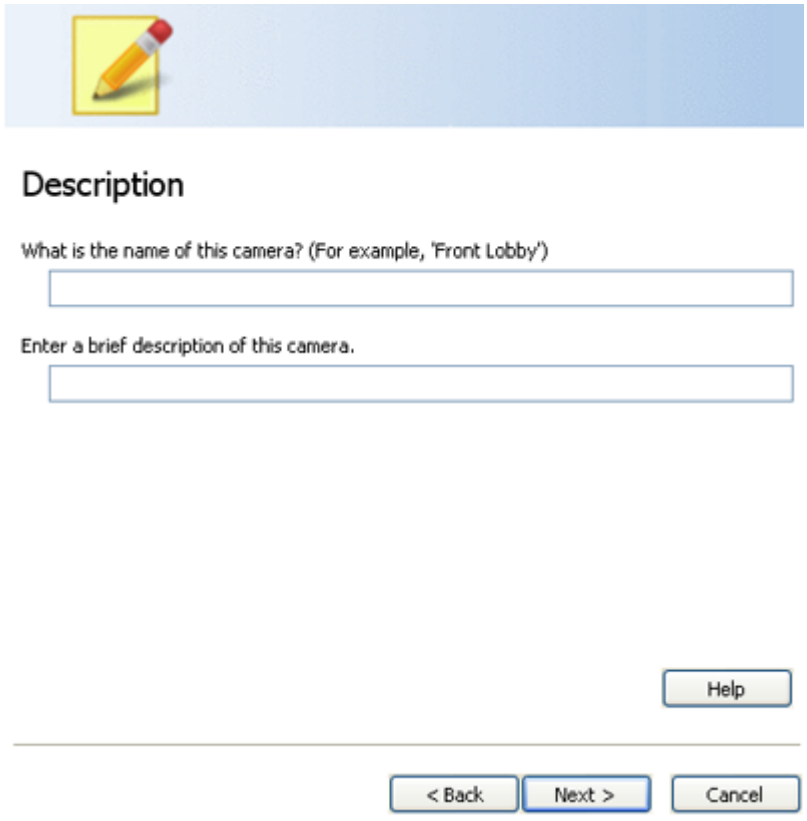
Note: Network cameras that are already in use are indicated by an asterisk (*) and are grayed out.



6 Enter the username and password if they are configured, then click *Next*.

Note: Clicking *Test Camera* runs an operational check on the network camera.

7 Enter the description, then click *Next*.



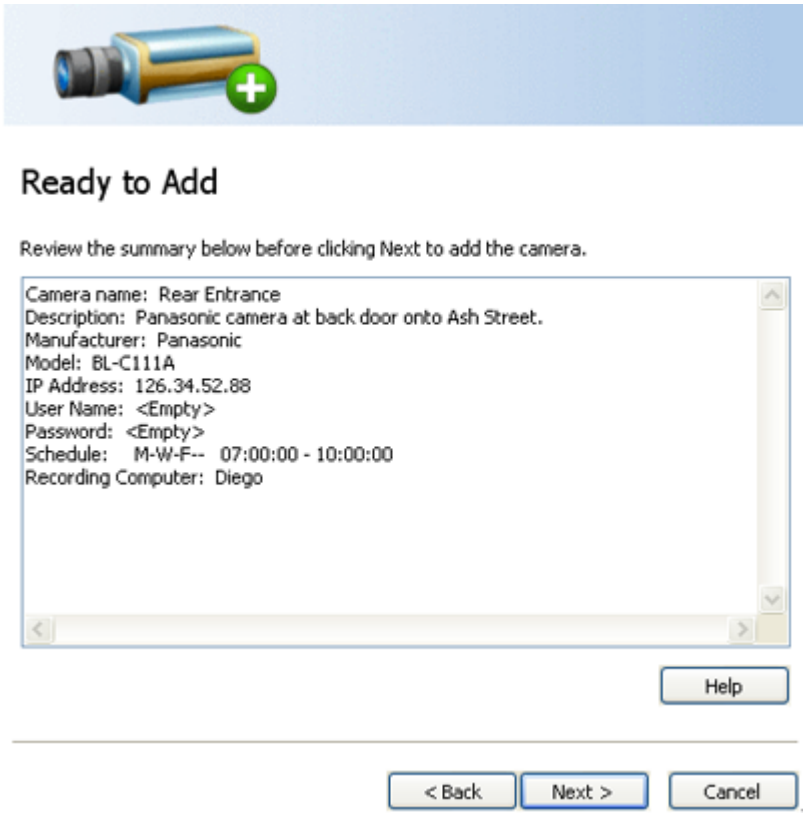
8 Select the recording schedule, then click *Next*.



9 Select the TeraStation where the video will be recorded, then click *Next*.

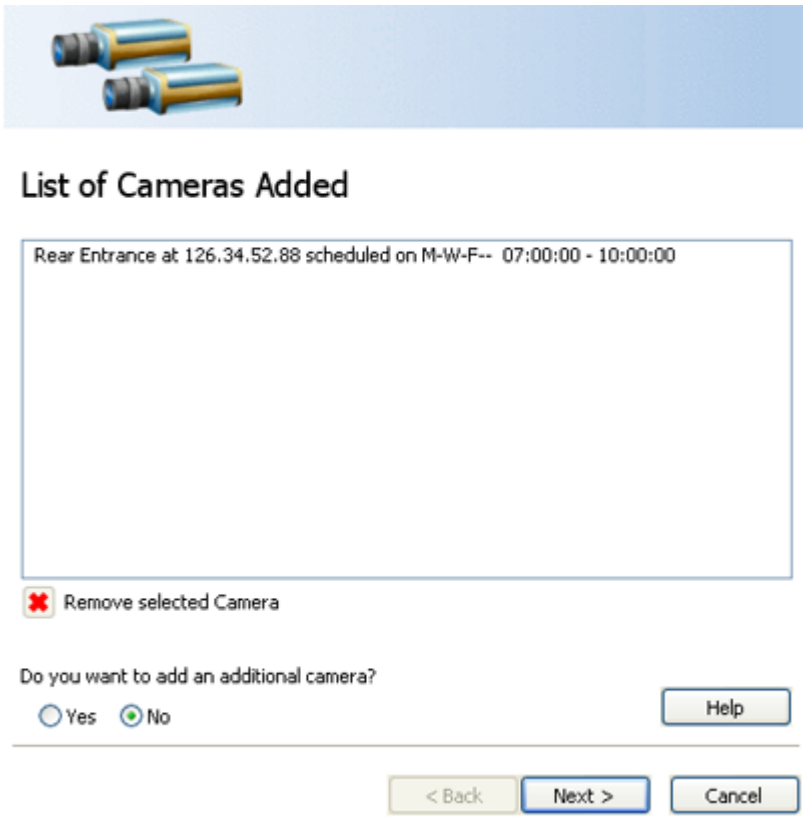


10 Check the registration information; if it is correct, click *Next*.

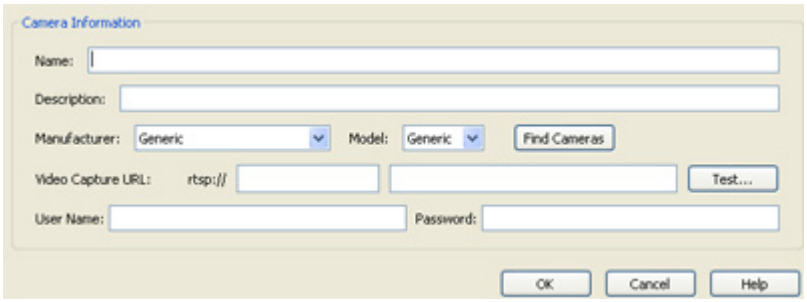


11 Click *Next*.

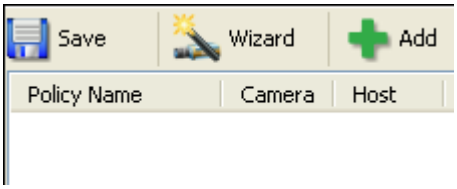
An additional network camera can be registered by selecting "Yes" when asked "Do you want to add an additional camera?"



12 Click *Finish*.



13 Click *Save*.



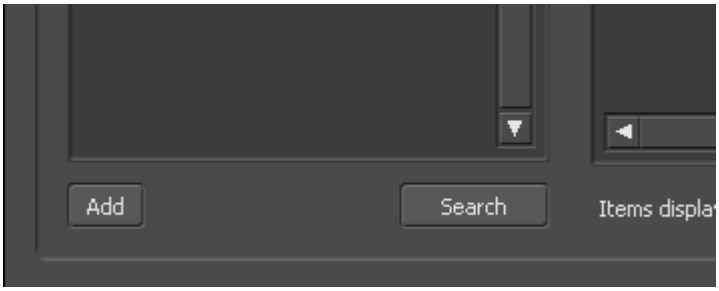
Recording will begin. You've now registered the recording policy of the network camera.

Checking Recording

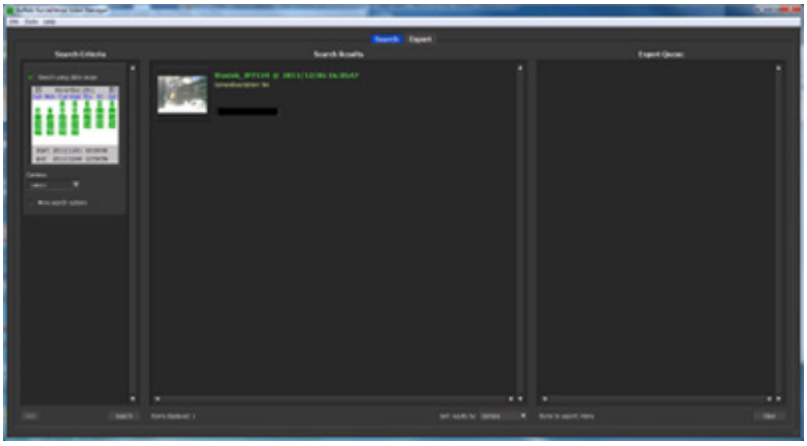
To check that recording is working correctly, follow the procedure below. Wait at least 15 minutes after registering the recording policy before checking the recording.

1 Click *Start - BUFFALO - BUFFALO Surveillance Server - Surveillance Video Manager*.
For Windows 8.1 and Windows 8, click *Surveillance Video Manager* in the Start menu.

2 Click *Search*.



3 Recorded video clips are shown in the center of the screen. Click a video clip to start playback.



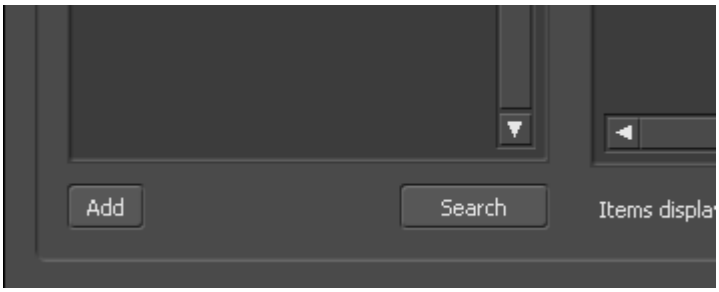
This completes checking recording.

Viewing Saved Video

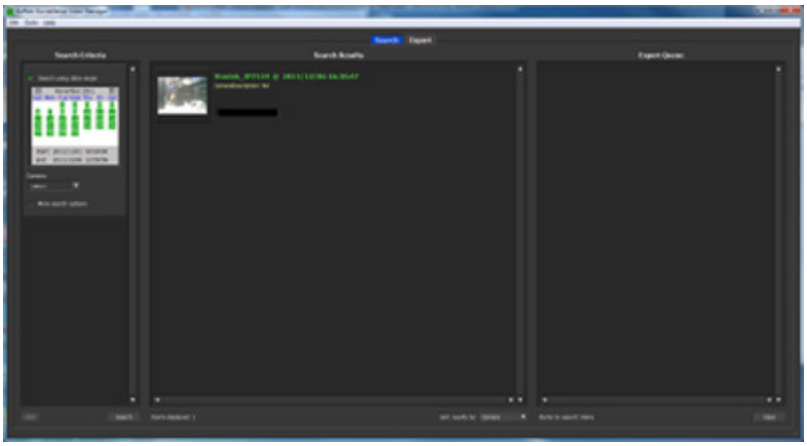
Follow the procedure below to view recorded data saved in the TeraStation.

1 Click *Start - BUFFALO - BUFFALO Surveillance Server - Surveillance Video Manager*.
For Windows 8.1 and Windows 8, click *Surveillance Video Manager* in the Start menu.

2 Click *Search*.



3 Video clips are shown in the search results at the center of the screen. Click the clip to start playback.



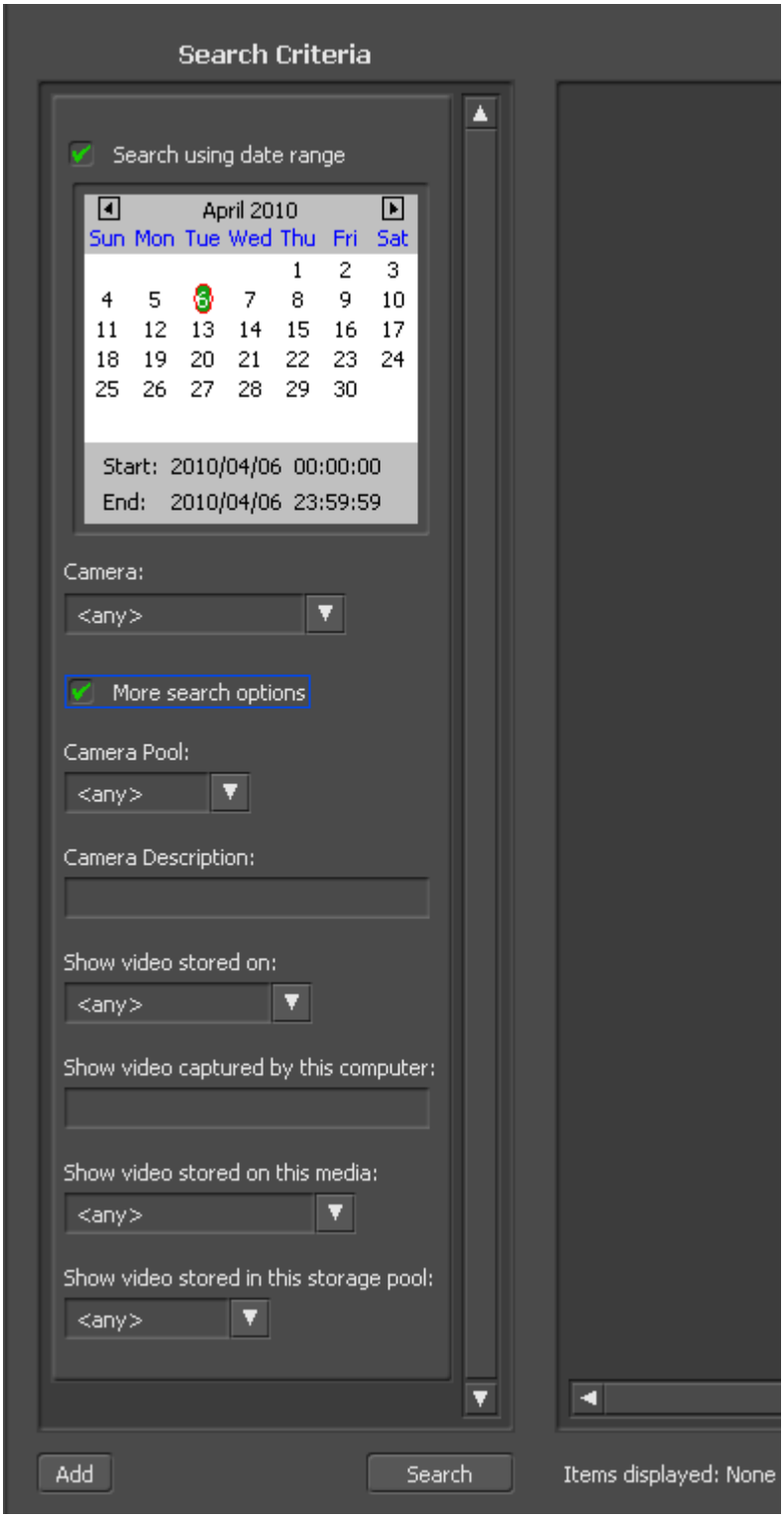
Advanced Usage

Export Recorded Data as a MOV Video File

To export recorded data saved to the TeraStation as a MOV format video file:

1 Click *Start - BUFFALO - BUFFALO Surveillance Server - Surveillance Video Manager*.
For Windows 8.1 and Windows 8, click *Surveillance Video Manager* in the Start menu.

2 Select the search criteria on the left side of the search screen, then click *Search*.



3 The search results are displayed. Click a thumbnail to start the media viewer.

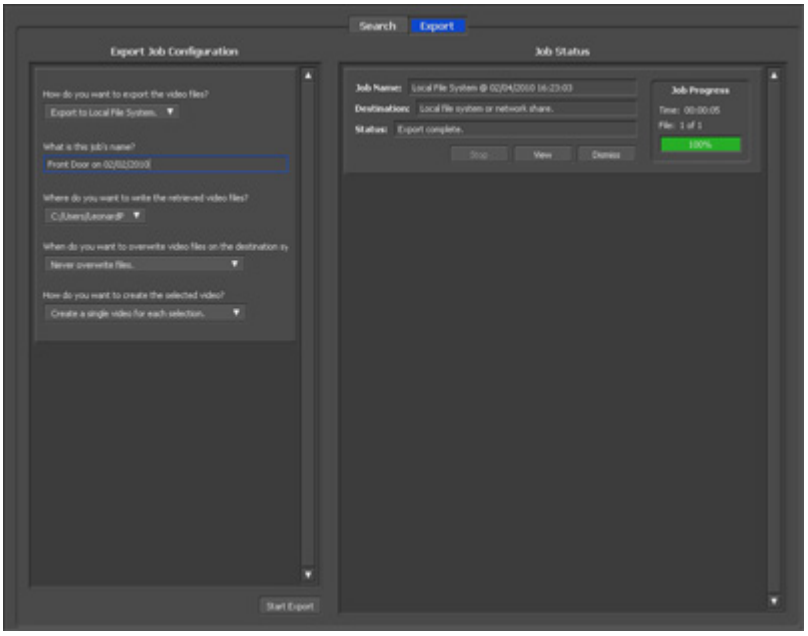


4 Select the section to export and click *Export*. This will register the video to the export queue.





5 Open the Export screen, register the export information from "Export Job Configuration", and click "Start Export". The video is exported in MOV format.



This completes exporting video in the MOV format.

Viewing Video Real-time

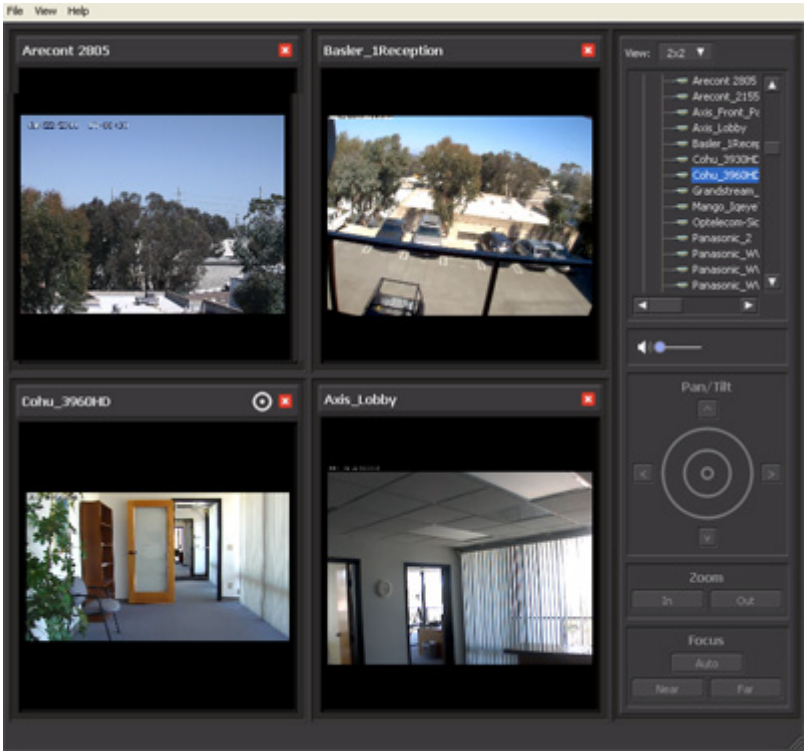
Follow this procedure to view the video as it is being recorded by the network camera.

Note: Live Viewer data cannot be viewed.

1 Click *Start* - *BUFFALO* - *BUFFALO Surveillance Server* - *Live Viewer*.

For Windows 8.1 and Windows 8, click *Live Viewer* in the Start menu.

2 Registered network cameras are listed in the "Cameras" folder on the right side of the screen. To view a video that is currently being recorded, double-click the camera whose video you want to view or drag to a frame of the camera viewer on the left side of the screen.



This completes viewing current video.

Moving Recorded Video Data to Another TeraStation

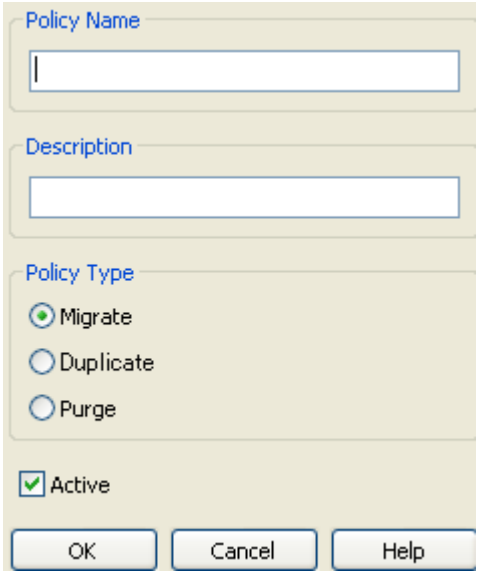
Follow the procedure below to move (migrate) the recorded video data to another TeraStation.

Note: A separate surveillance server license pack must be purchased to do this.

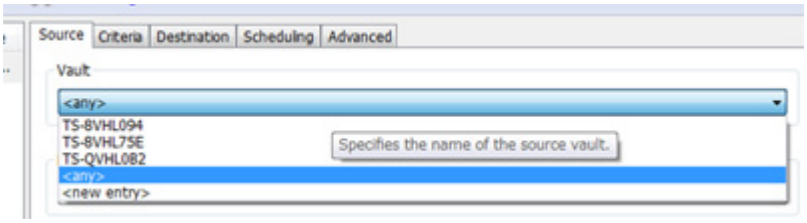
1 Click *Start - BUFFALO - BUFFALO Surveillance Server - Data Service Policies*.

For Windows 8.1 and Windows 8, click *Data Service Policies* in the Start menu.

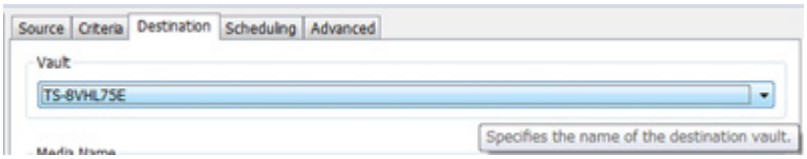
2 Click  and when the Create a Policy screen is opened, enter "MigrateTest" into the "Policy Name" field, select "Migrate", and click *OK*.



3 Click the *Source* tab. Under "Vault", select the TeraStation where the recorded video data is saved. Select "Any" to migrate recorded data on all network-connected TeraStations.



4 Click the *Destination* tab to select which TeraStation you want to move the data from "Vault" off of.



5 Set the migration date and time on the *Scheduling* tab. To execute migration every hour, select "Repeatedly at a defined interval" and "Every 1 hour".

6 Click and register the policy.

This completes the settings for moving recorded video to another TeraStation.

Backing Up Recorded Video to Another TeraStation

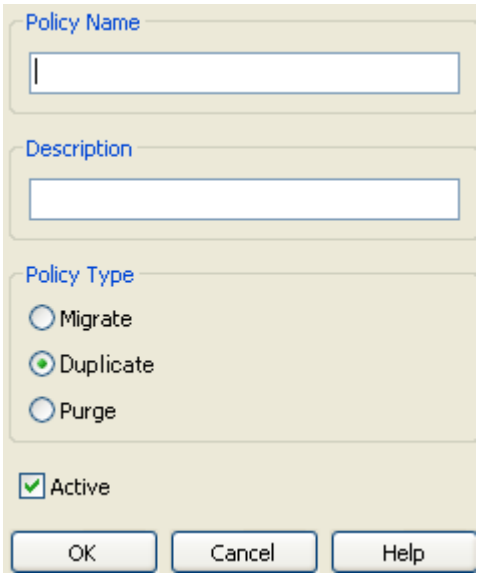
Follow this procedure to back up recorded video data to another TeraStation.

Note: A separate surveillance camera license pack must be purchased to do this.

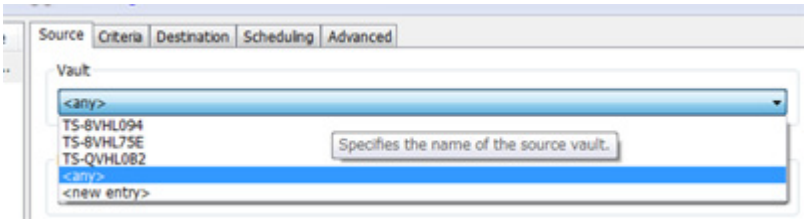
1 Click *Start - BUFFALO - BUFFALO Surveillance Server - Data Service Policies*.

For Windows 8.1 and Windows 8, click *Data Service Policies* in the Start menu.

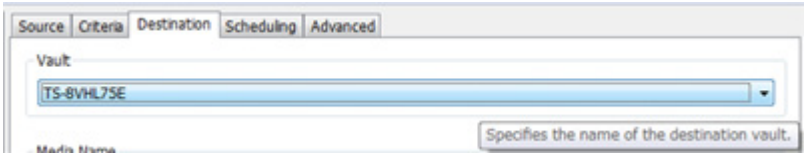
2 Click and when the Create a Policy screen opens, enter "DuplicateTest" into the "Policy Name" field, select "Duplicate", and click *OK*.



3 Click the *Source* tab and select the TeraStation where the recorded video data is saved under "Vault".



Note: If "any" is selected, recorded data for all TeraStations connected to the network will be backed up. Click the *Destination* tab, then select the TeraStation where you want to move the data from "Vault".



4 Set the job execution date and time from the *Scheduling* tab. In this example, to execute the backup job every hour, select "Repeatedly at a defined interval" and "Every 1 hour".

5 Click and register the policy.

This completes the settings for backing up video to another TeraStation.

Automatically Delete Old Data when Space is Low

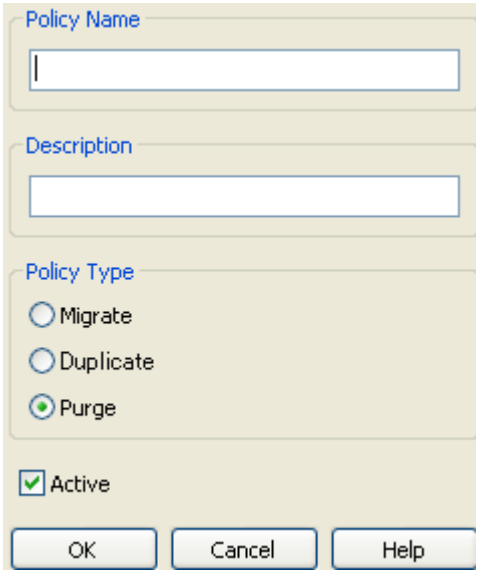
Follow the procedure below to delete (purge) recorded video starting from the oldest when available space for recording video becomes low.

Note: By default, old video data will be deleted automatically when 80% of available space is used. Old data will be removed at the same rate as new video is added, so there will always be enough video to fill about 80% of the total available space. To disable this setting, remove the "Remove Old Video" policy from "Data Service Policies".

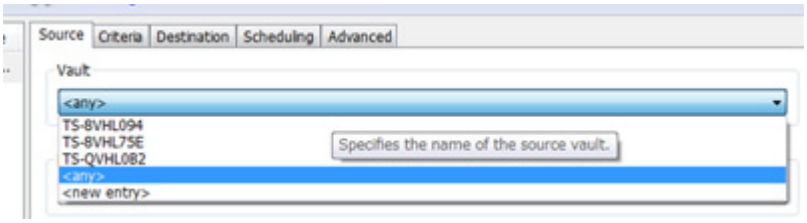
1 Click *Start* - *BUFFALO* - *BUFFALO Surveillance Server* - *Data Service Policies*.

For Windows 8.1 and Windows 8, click *Data Service Policies* in the Start menu.

2 Click and when the Create a Policy screen is opened, enter "PurgeTest" into the "Policy Name" field, select "Purge", and click *OK*.



3 Click the *Source* tab and select the TeraStation on which recorded video is saved under "Vault".



4 Open the *Criteria* tab; under "Miscellaneous Options", set "Watermark: High" and "Watermark: Low" options. This determines the used space threshold.

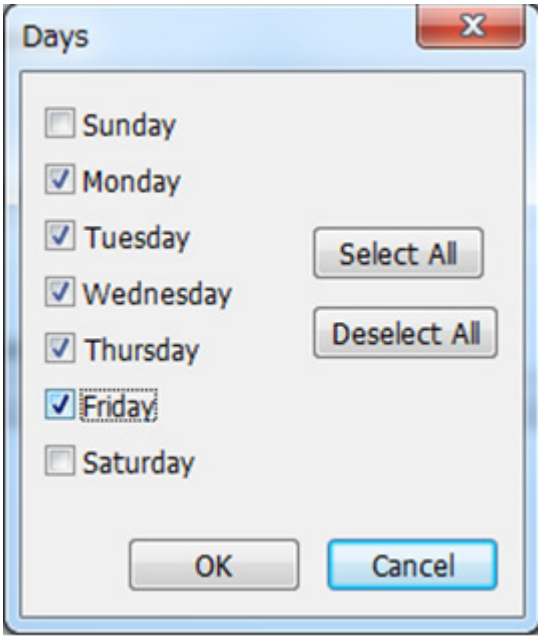
For example, if you set Watermark: High to "80" and Watermark: Low to "40", old data will be deleted when the amount of used space exceeds 80% until it drops to 40%.

5 Set the job execution date and time from the *Scheduling* tab. In this example, we'll configure a job to execute at 2:00 AM on weekdays.

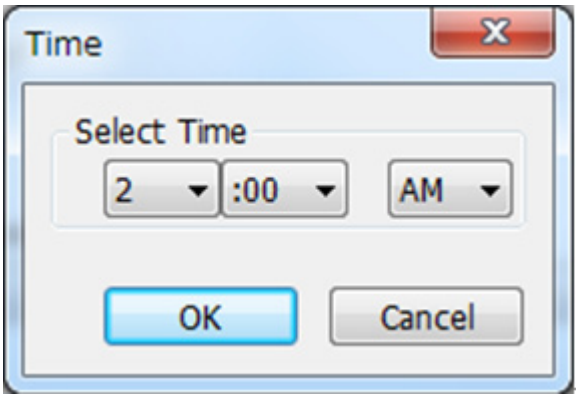
- Select "On selected days each week".



- Select every day between Monday and Friday.



- Select "2:00" and "AM", then click *OK*.



6 Click and register the policy.

This completes the registration of the policy. The job is executed at 2:00 AM Monday to Friday.

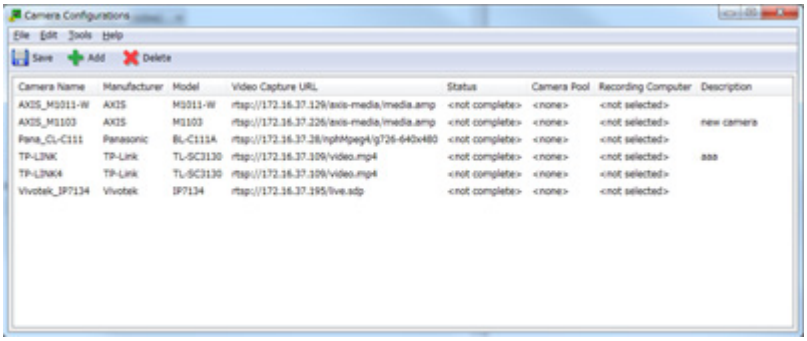
Changing Where Recorded Video Is Saved

Follow this procedure to change the TeraStation to which video is saved.

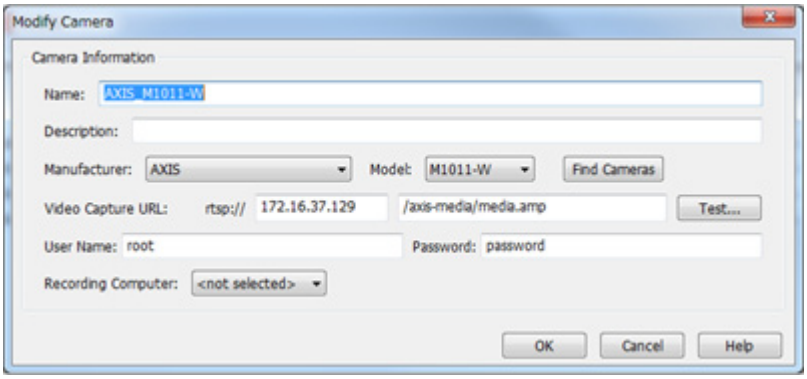
1 Click *Start* - *BUFFALO* - *BUFFALO Surveillance Server* - *Camera Policies*.
For Windows 8.1 and Windows 8, click *Camera Policies* in the Start menu.

2 Click the  icon on the tool bar and open the "Camera Configurations" screen.

3 Double-click the camera for which video will be saved. This opens "Modify Camera".



4 Change the TeraStation you want to use as the "Recording Computer" and click *OK*.



5 Click  and register the policy.

This completes changing the TeraStation where recorded video is saved.

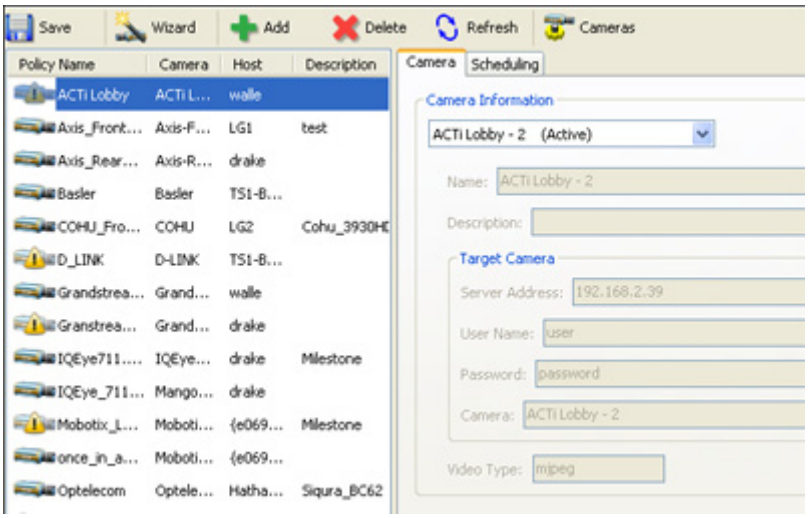
Email Notifications

You may configure the TeraStation to send you an email notification when the available space for recording is low, or if recording fails due to a camera malfunction, network disconnection, or other cause.

Client Tools

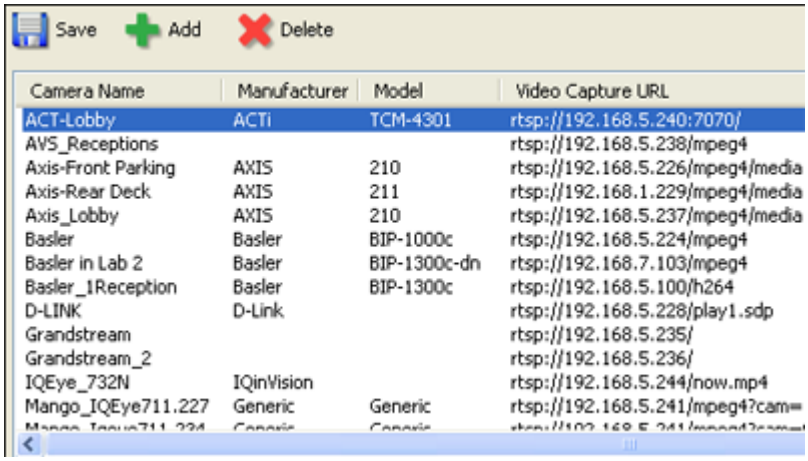
Camera Policies

Camera Policies is utility software that registers the network cameras and starts video recording.

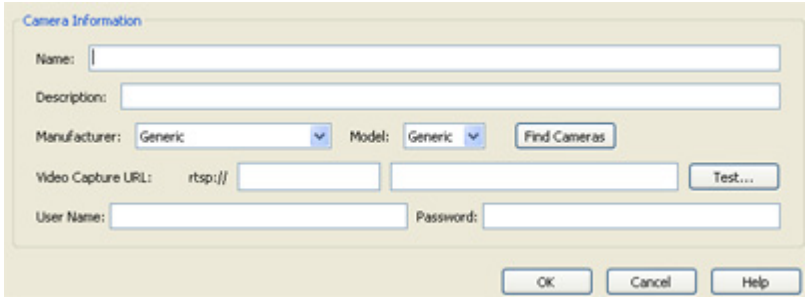


Click  to start a wizard to register network cameras and schedule recording.

Click  to open the camera configuration screen where network cameras are registered.

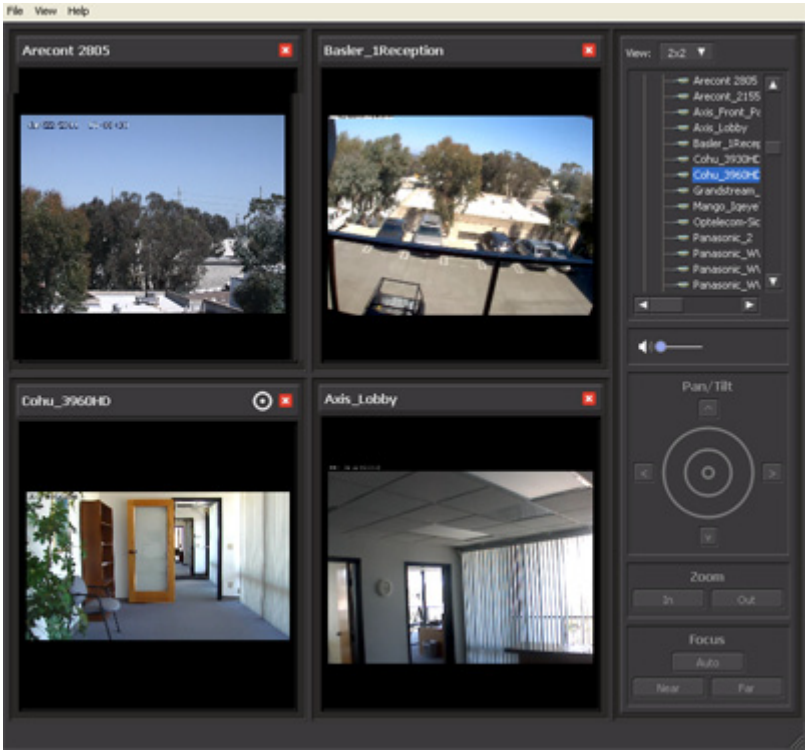


Click  to start a new registration screen for an additional network camera. You can also register the camera and define the recording video policy.



Live Viewer

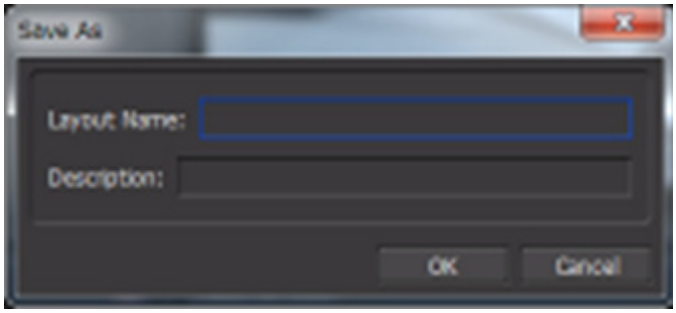
Live Viewer allows you to view video currently being recorded by a network camera.



Note: To view the current video, the network camera must be registered in Camera Policies.

- The layout of the camera view (numbers of rows and columns) and registered network cameras are displayed in the panel on the right side of the screen.
- The camera view (live video) is displayed on the left side panel. In the default setting, a 2x2 camera view is displayed. A layout view with up to 4x4 cameras can be displayed.
- Double-clicking the network camera name or dragging to the camera view frame enables viewing of the current video that is being recorded by the network camera.

The layout can be saved in *View - Save Layout As*.



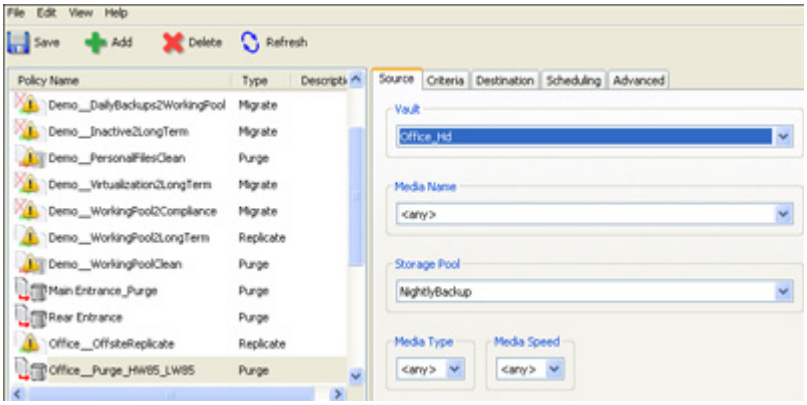
Data Service Policies

Data Service Policies is utility software for creating data service policies. The policy types that can be created are shown below.

Note: To use migration and duplication, a separate backup license must be purchased.

Policy Type	Action
Migration	Moves recorded video data to another TeraStation
Duplication	Copies recorded video data to another TeraStation and synchronizes the data.

Policy Type	Action
Purge	Deletes the recorded video data.



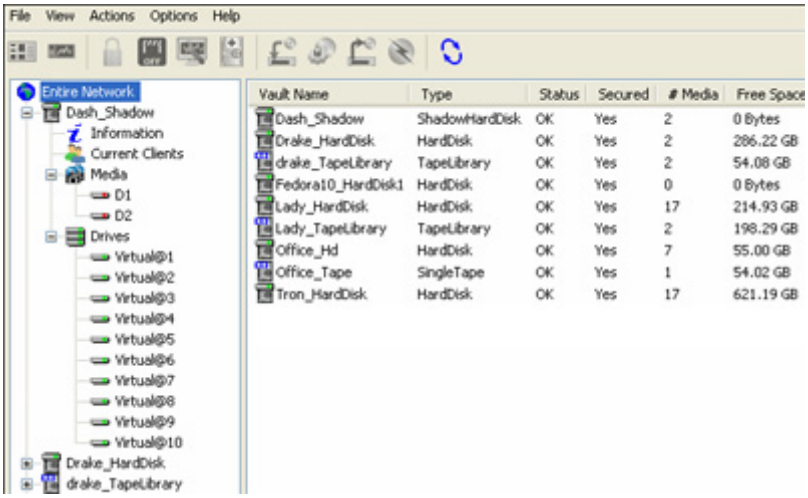
The right side of the screen includes tools for creating and updating data service policies. The left side of the screen shows an overview of all data service policies.

Notes:

- If  is displayed for a policy in the left-side frame, the policy is disabled.
- Surveillance server functionality must be enabled beforehand for the TeraStation where migration or duplication files will be saved.

Vault Admin

Vault Admin is utility software for managing surveillance camera resources.



Operations are performed from the tool bar located in the top section of the screen.



The icons and their functions are shown below.

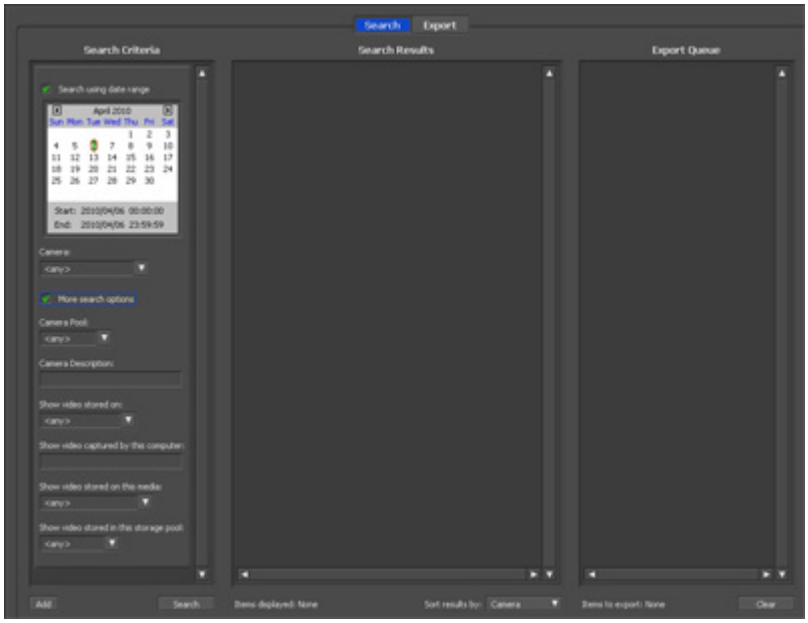
Icon	Description
	Starts "Mini Vault Stats" for enabling the display of basic monitoring information.
	Sets the security status.
	Shuts down or restarts a portion (Vault) of the surveillance cameras.
	Changes the properties.

Icon	Description
	Performs a diagnosis of the surveillance camera.
	Loads a media device.
	Prepares a media device.
	Unloads a media device.
	Erases a media device.
	Refreshes the current screen.

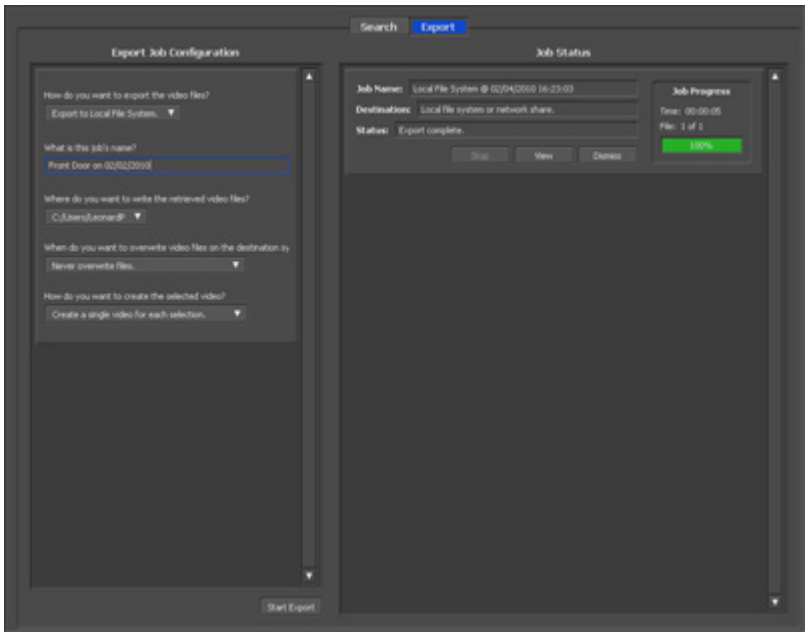
Surveillance Video Manager

Surveillance Video Manager is utility software for performing searches and exporting recorded video data.

Search Window

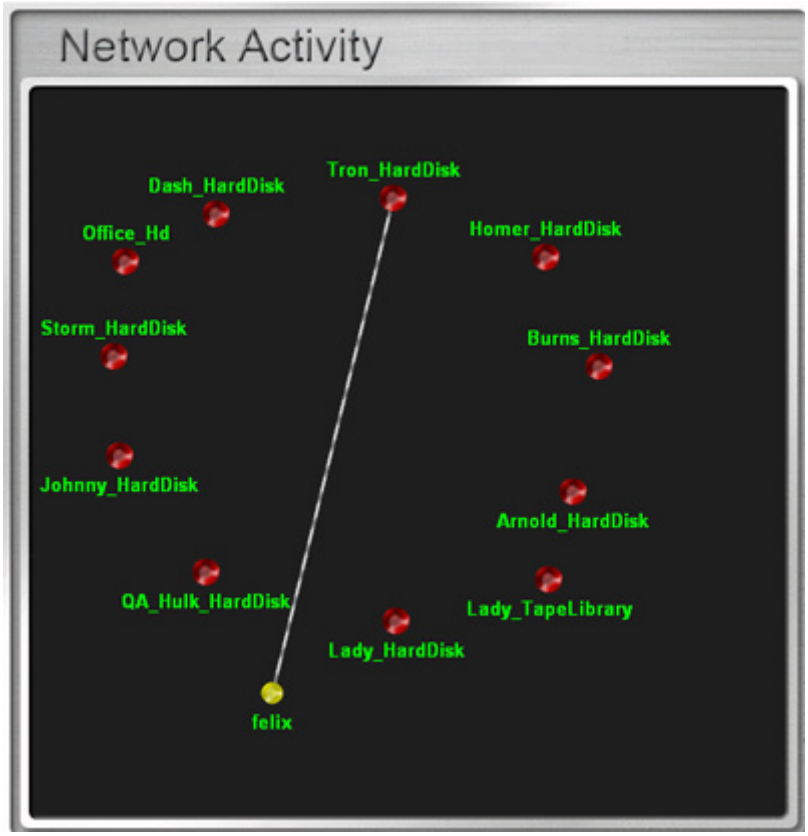


Export Window



Network Activity

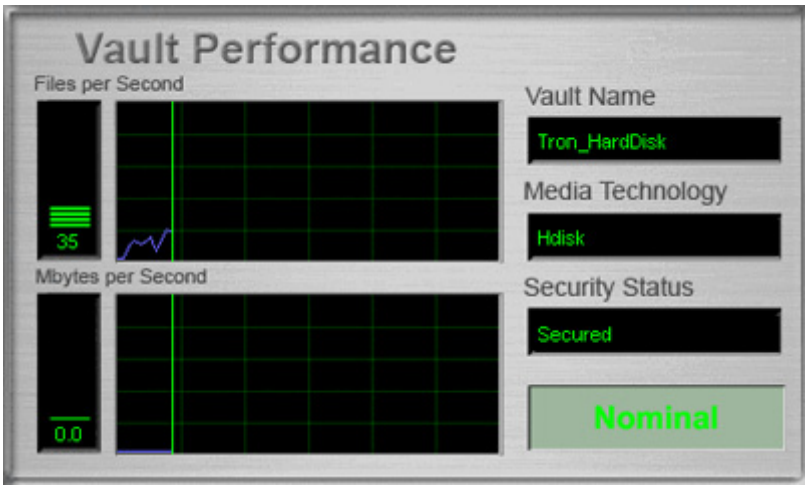
Network Activity is utility software that displays the TeraStations on which surveillance cameras are operating on the network in real time and in graphical form.



All clients and TeraStations located on the network are indicated by  and labels. These can be moved by dragging and dropping them. Clients are displayed only when a job is being executed and activities are indicated by a line linking the client and TeraStation.

Mini Vault Stats

Double-clicking the icon for a TeraStation on "Network Activity" starts "Mini Vault Stats". "Mini Vault Stats" shows the network traffic in graphical form.



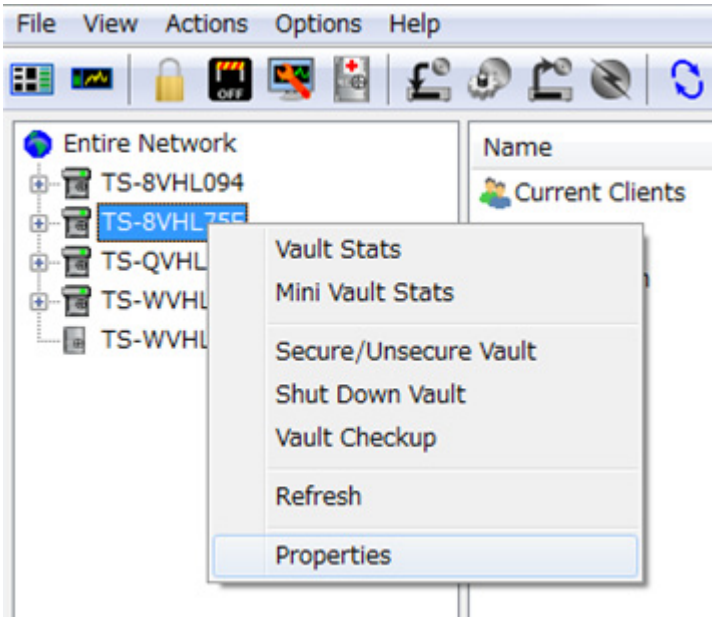
Activating Additional Licenses

Purchasing an additional license (sold separately) enables you to connect and use two or more cameras and use the migration and duplication functions. Use this procedure to activate an additional license.

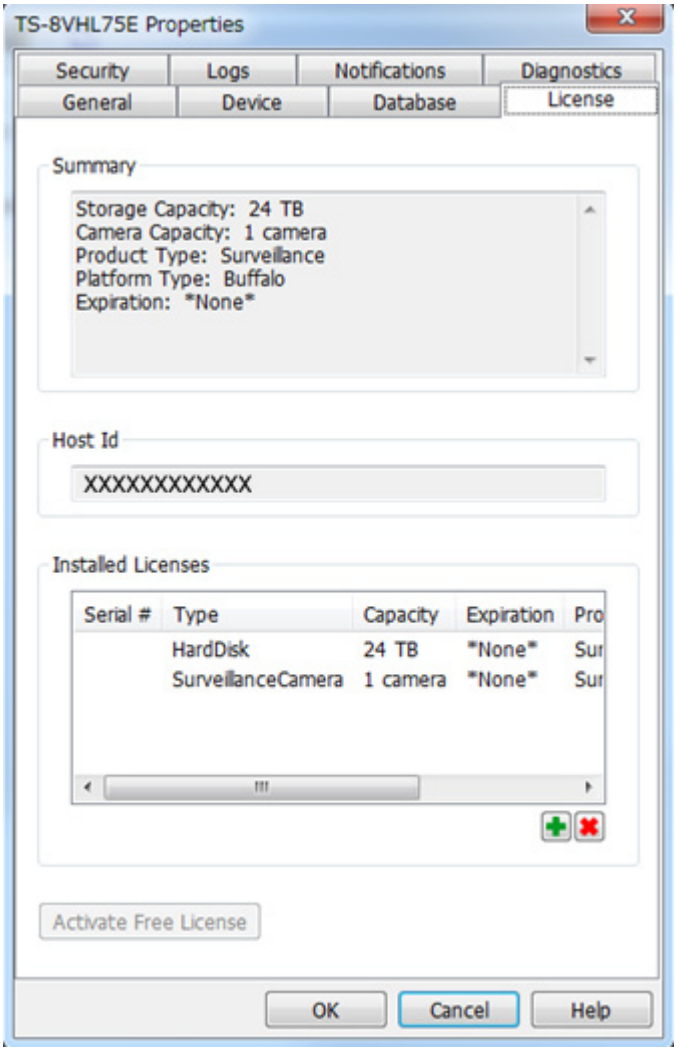
When the TeraStation is Connected to the Internet

1 Click *Start* - *BUFFALO* - *BUFFALO Surveillance Server* - *Vault Admin*.
For Windows 8.1 and Windows 8, click *Vault Admin* in the Start menu.

2 Select the TeraStation to which you want to add the license, right-click it, and click *Properties*.

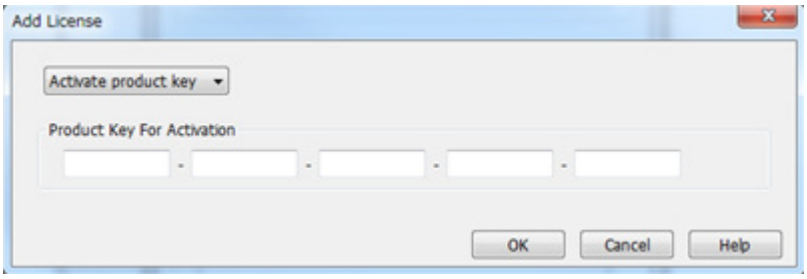


3 Open the *License* tab, then click +.

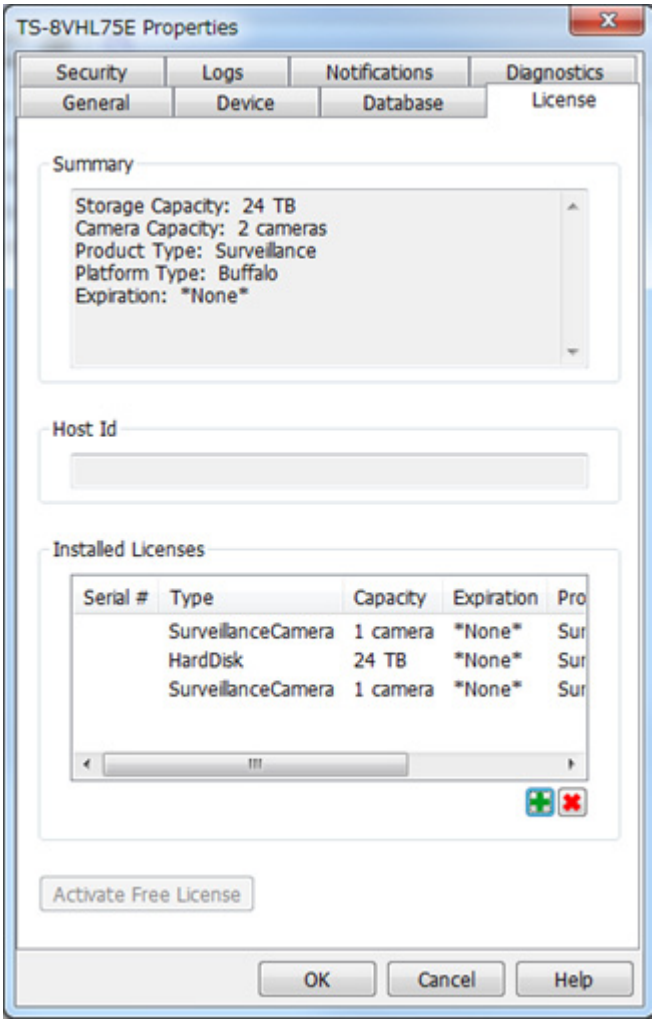


If your default free license activation is not installed, see the "Enabling the Free License" section to install it.

4 Enter the product key for the license pack (sold separately), then click *OK*.



5 Confirm that the new license was added to "Installed License".



You have now activated the additional license.

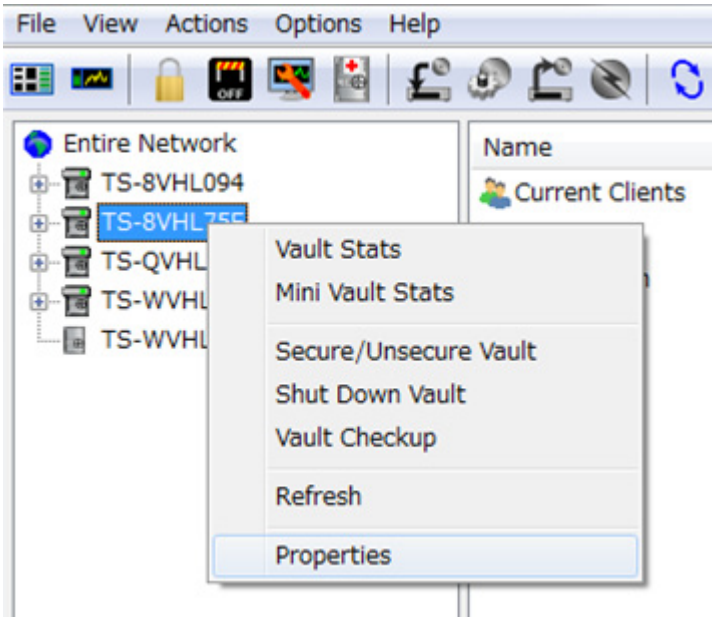
TeraStation Not Connected to the Internet

1 If the TeraStation is being used in an environment where Internet access is not available, a separate computer with access to the Internet is required to activate the additional license.

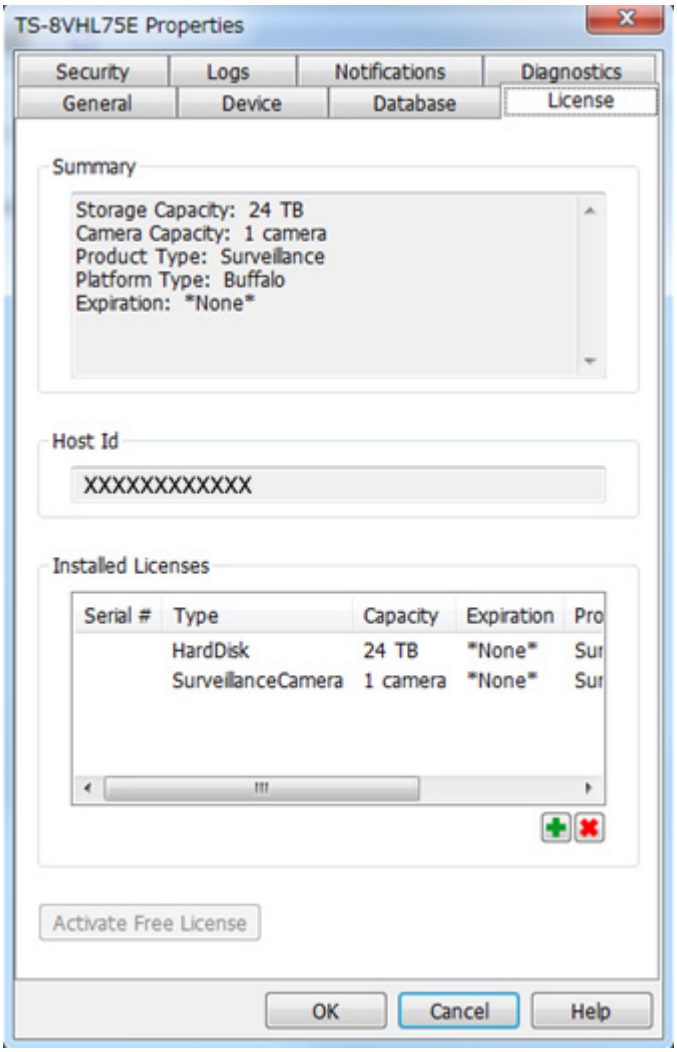
2 Click *Start* - *BUFFALO* - *BUFFALO Surveillance Server* - *Vault Admin*.

For Windows 8.1 and Windows 8, click *Vault Admin* in the Start menu.

3 Select the TeraStation where you want to add the license, right-click it, and click *Properties*.

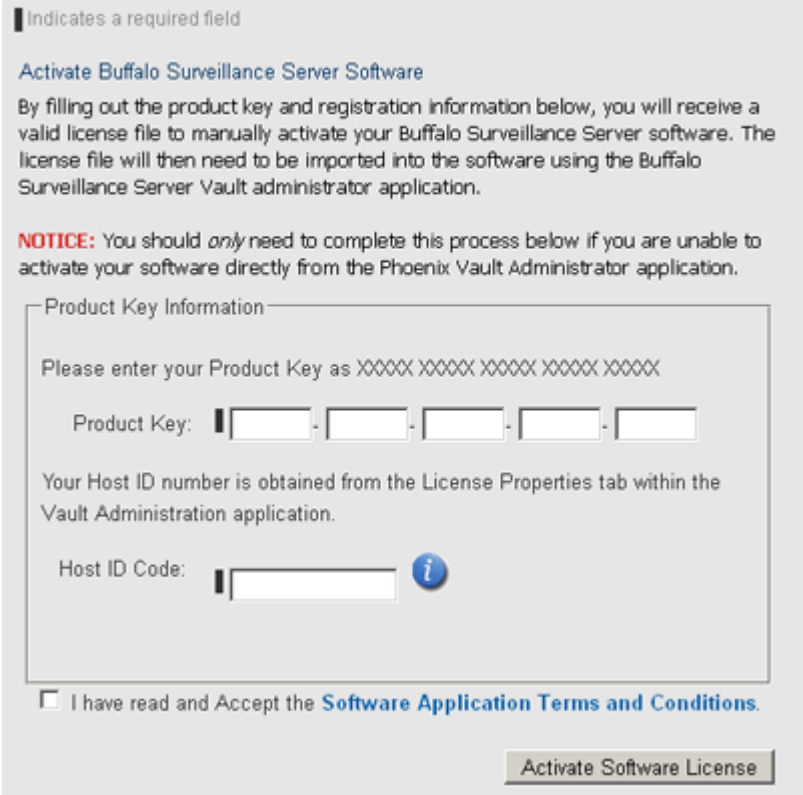


4 Open the *License* tab, then make a note of the "Host Id".



5 Open the website in web browser: http://buffalo.jp/support_s/camera_licence/.

6 From the license pack (sold separately), enter the product key and host ID code and click "Activate Software License".



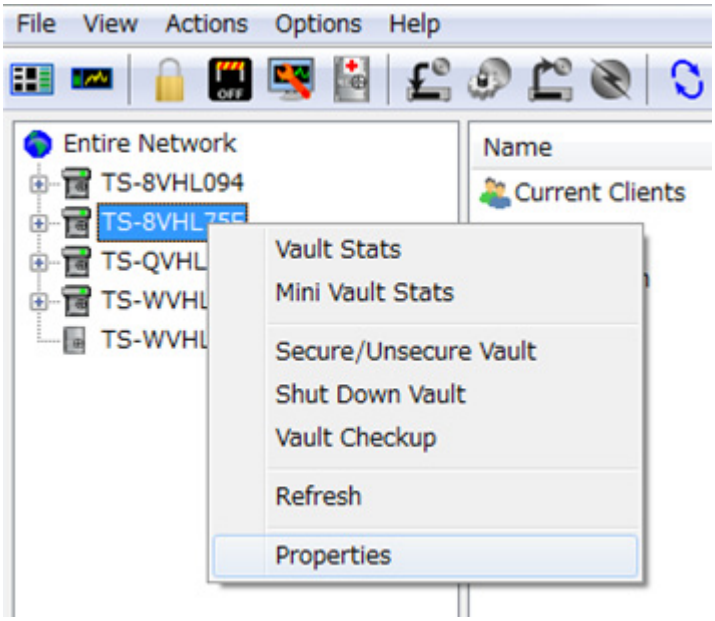
7 Downloading of the license file (*.lic) begins. Save the license file to a USB memory drive or other storage device.

8 Copy the license file to a computer connected to the same network as the TeraStation.

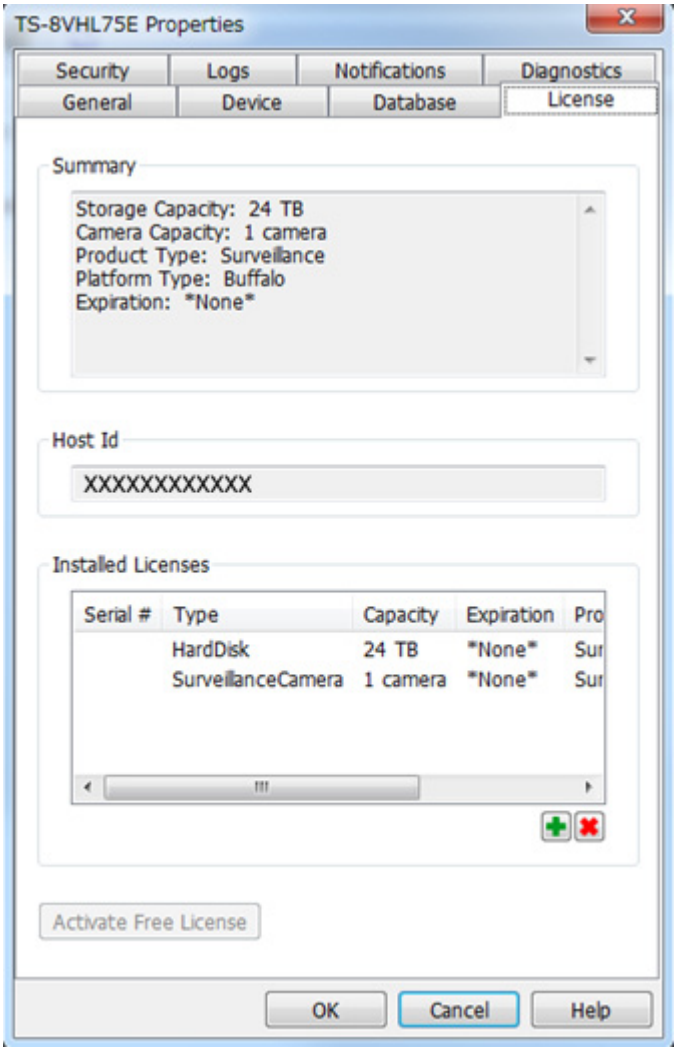
9 In the computer connected to the same network as the TeraStation, click *Start* - *BUFFALO* - *BUFFALO Surveillance Server* - *Vault Admin*.

For Windows 8.1 and Windows 8, click *Vault Admin* in the Start menu.

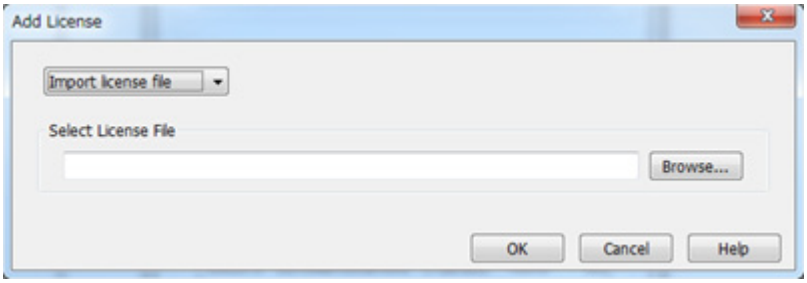
10 Select the TeraStation to which you want to add the license, right-click, and click *Properties*.



11 Open the *License* tab, then click +.

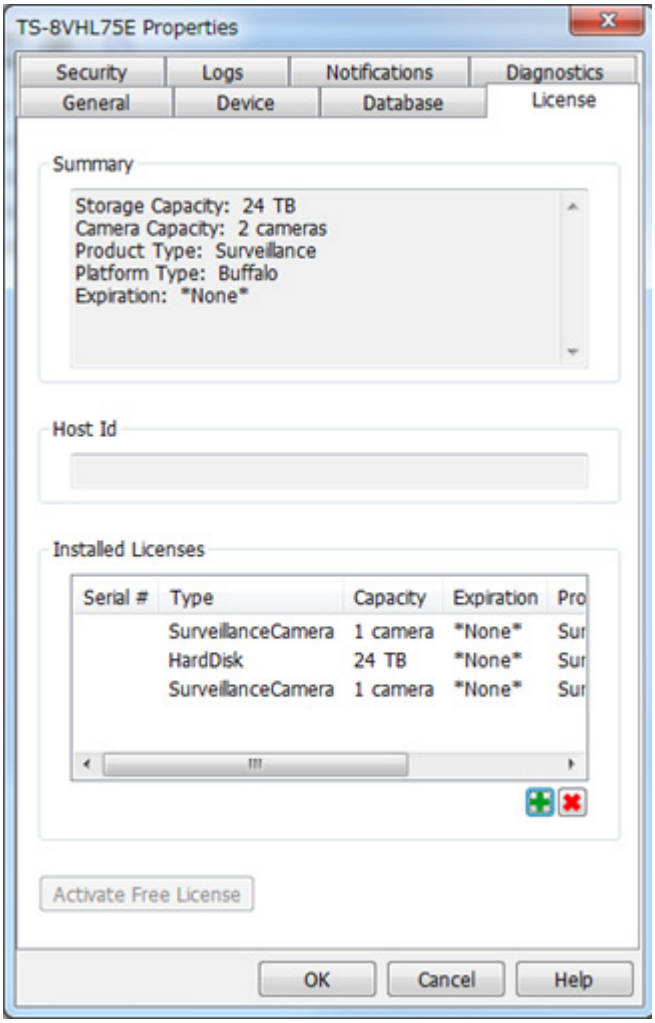


12 Select "Import license file", then click *Browse*.



13 Select the license file that was saved before, then click *OK*.

14 Check that the license pack was added to "Installed Licenses".



This completes authentication of an additional license.

Troubleshooting

Issue	Possible Cause	Possible Solution
Video recording does not start.	Surveillance camera setting not enabled.	Enable surveillance camera in Settings.
	A LAN cable between the TeraStation and network camera is disconnected, or the power is turned off.	Check that the LAN cables are inserted correctly.
	The video recording policy is not registered.	Register the video recording policy from Camera Policies.
	The device is not connected to a network on the same LAN, or the device is not connected to the LAN port that was set in Settings.	Connect the device to the network of the LAN port that was set in Settings.
	The disk is full.	Free available space on the disk by moving or deleting files.
	The time for the TeraStation and network camera is not correct.	Set the time in Settings.
	There are not enough camera licenses for the network cameras.	Purchase and register an additional license.
I cannot enable the surveillance camera.	Failover is running.	Disable failover.
Surveillance cameras no longer record video.	Surveillance camera functionality is not enabled.	Enable surveillance camera functionality in Settings.
I cannot view the network camera using Live Viewer.	The network camera is not registered in some camera policies.	Register the network camera from camera policies.
	There is an error in the network camera settings.	Verify the settings in the camera policies.
There is no recorded data, or the recorded data cannot be found.	A camera was added in camera policies while Surveillance Video Manager was running.	If this is the case, this video may not be accessible. Restart Surveillance Video Manager to enable searching for recorded video from the new camera.

Notes:

- QuickTime is a trademark of Apple Inc., registered in the U.S. and other countries.
- VLC media player is a trademark of Video LAN org.
- See the Buffalo website for supported cameras.
- Refer to the "Buffalo Surveillance Server Administrator's Guide" available from the Buffalo website for information about client tools.
- The TeraStation supports up to five network cameras but includes only a single camera license. To use more than one camera, additional licenses must be purchased and registered.

Chapter 10 Advanced Features

Antivirus Software

Trend Micro NAS Security can protect your network and data from software viruses, malware, and spyware. Virus scan by Trend Micro NAS Security is available for files in the TeraStation's shared folders, except for "usbdisk" and "mediacartridges" folders.

To use Trend Micro NAS software, purchase an OP-TSVC license pack (sold separately). If your TeraStation is already running an activated antivirus software, no license registration is necessary.

Notes:

- If LVM is enabled on the TeraStation, the antivirus software may not work properly. For best results, disable LVM before use.
- To use the antivirus software effectively, the TeraStation should be connected to the Internet. The connection can be routed through a proxy server if the appropriate settings are configured in *Administration - Proxy Settings* from the left-side menu of the Trend Micro NAS Security settings page.
- Trend Micro is a trademark of Trend Micro Incorporated.

Activating Virus Scanning

Follow the procedure below to activate virus scanning.

1 In Settings, click *Applications*.



2 Move the antivirus switch to the  position.



A quarantine folder named "TMNAS" is automatically created on the TeraStation. If a virus is detected, it is moved to this folder.

If you want to configure the specific shared folder as a quarantine folder, follow the procedure blow.

1 Create a new shared folder by referring to the "Adding a Shared Folder" section in chapter 3.

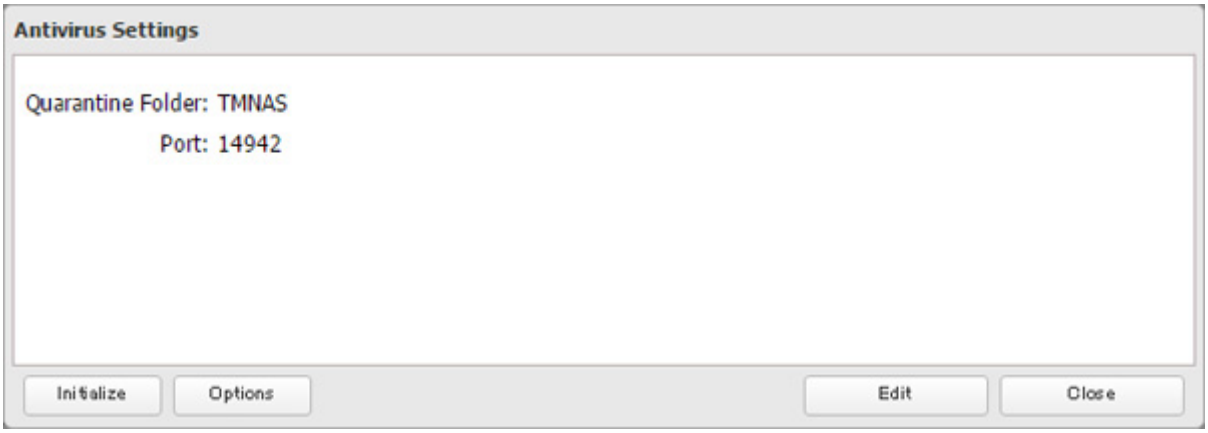
2 In Settings, click *Applications*.



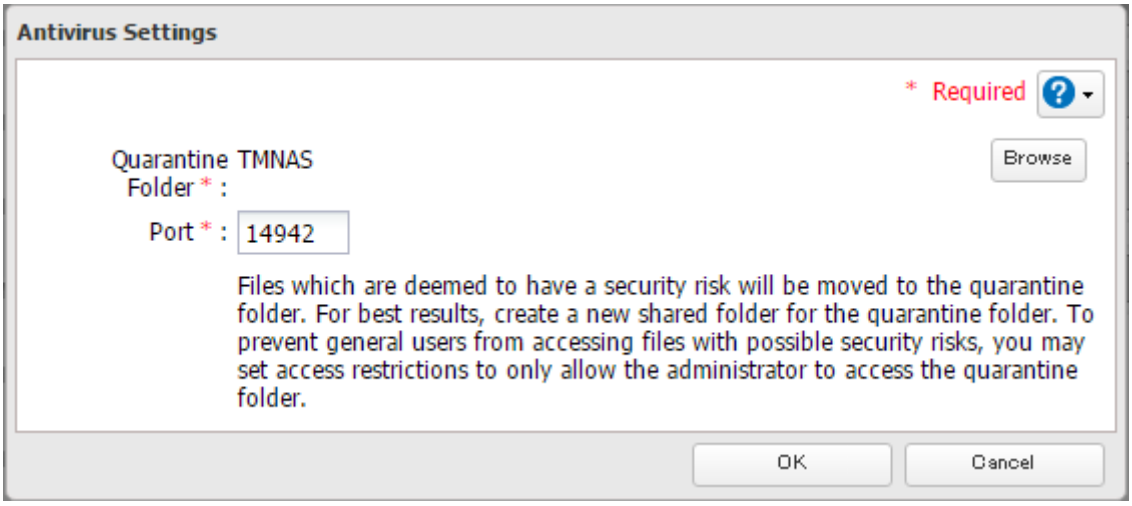
3 Click  to the right of "Antivirus".



4 Click *Edit*.



5 Click *Browse* and select the quarantine folder.



6 Click *OK*.

Configuring Security Settings

Use the Trend Micro NAS Security settings page to configure security settings such as updating pattern files, configuring scan schedules, and activating or expanding the license. To open the settings page, follow the procedure below.

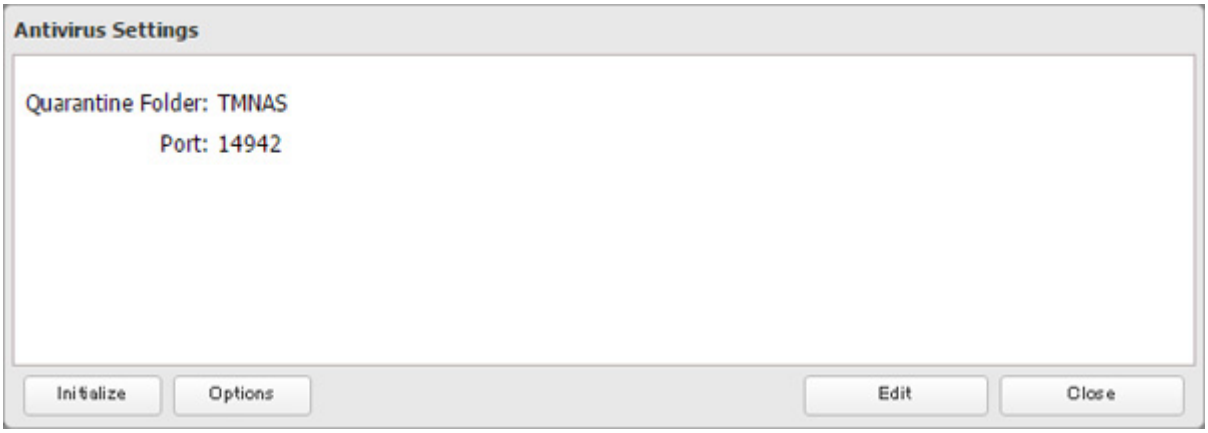
1 In Settings, click *Applications*.



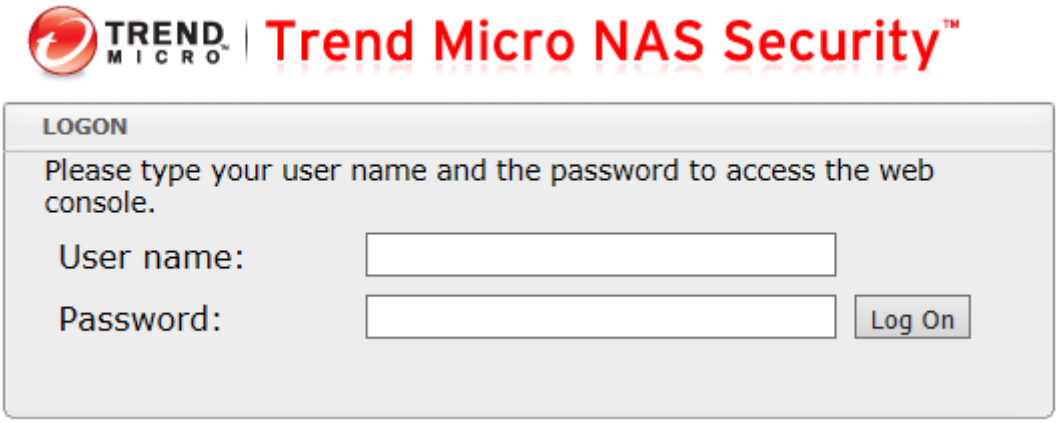
2 Click  to the right of "Antivirus".



3 Click *Options*.

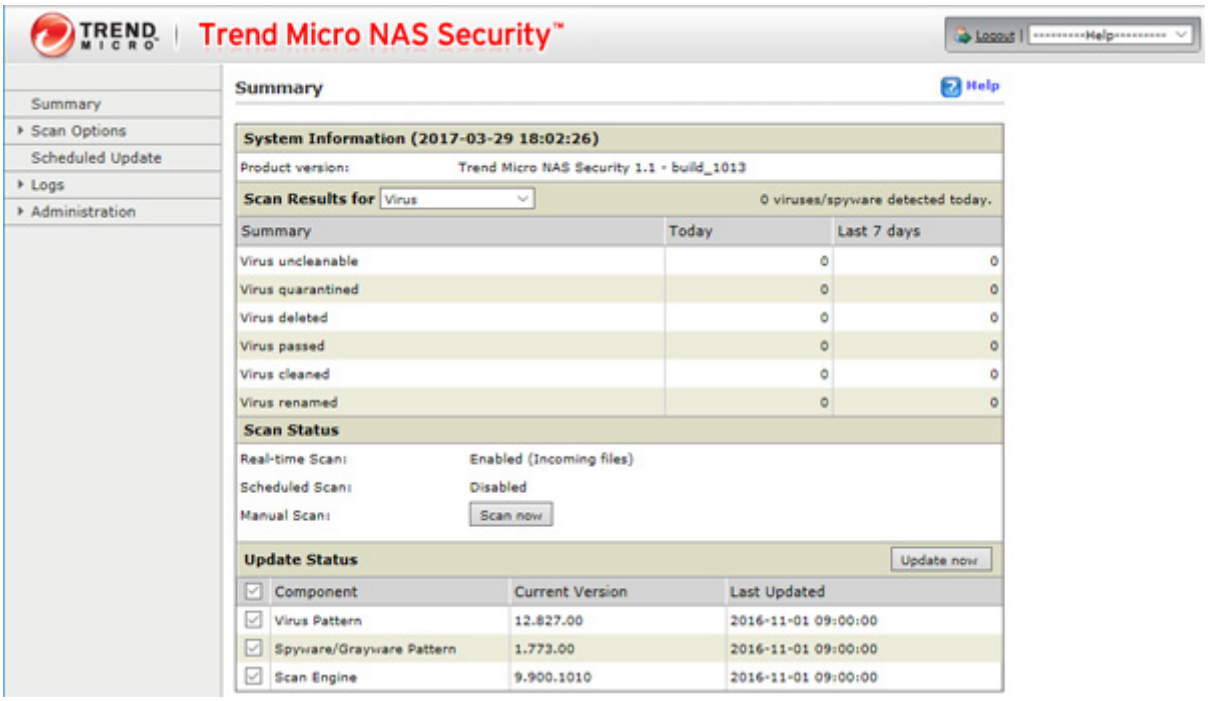


4 Enter your username and password, then click *Log On*.



You can log on with the TeraStation's admin account. The default username and password are "admin" and "password".

5 The Trend Micro NAS Security settings page will open.

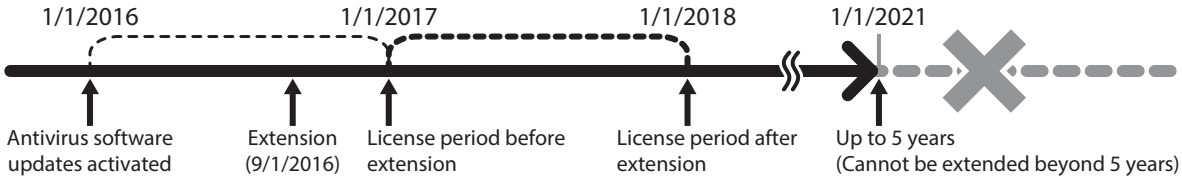


Notes:

- The Trend Micro NAS Security settings page is compatible with IE 6.0 SP2 or later (Windows) and Firefox 1.5 or later (Windows or Mac).
- To change the display language of the Trend Micro NAS Security settings page, change the system language to the desired settings by referring the "Name, Date, Time, and Language" section below.

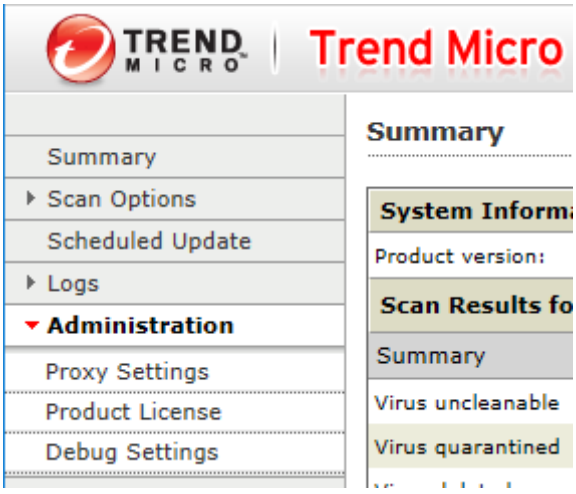
Licenses

If the antivirus software on your TeraStation is not activated or has expired, please purchase an OP-TSVC license pack (sold separately). If your TeraStation includes activated antivirus software, no license registration is necessary. The total period for antivirus software updates may be extended up to 5 years.
This example shows an initial 1-year period for updates extended by an additional year.



Note: It's not possible to register a serial number that would extend the total license period beyond 5 years, such as a second 3-year license after 3 years.

1 From the left-side menu of the Trend Micro NAS Security settings page, click *Administration* - *Product License*.



2 Enter the serial number from the "Trend Micro NAS Security License Pack Guide", included in your package. Click *Activate*.



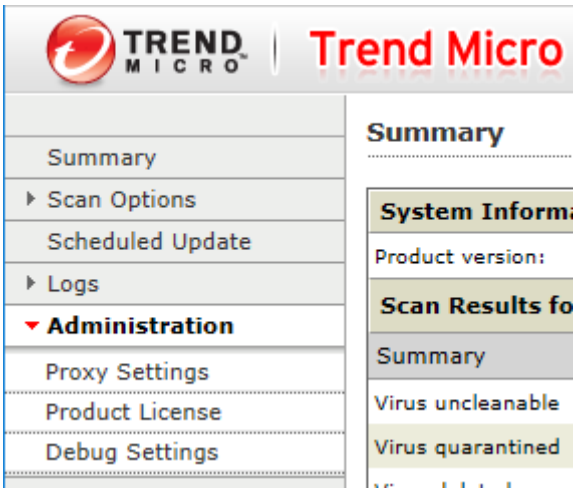
The new license is now registered.

To check the status of the current license, open the Trend Micro NAS Security settings page and navigate to *Administration - Product License* on the left-side menu.

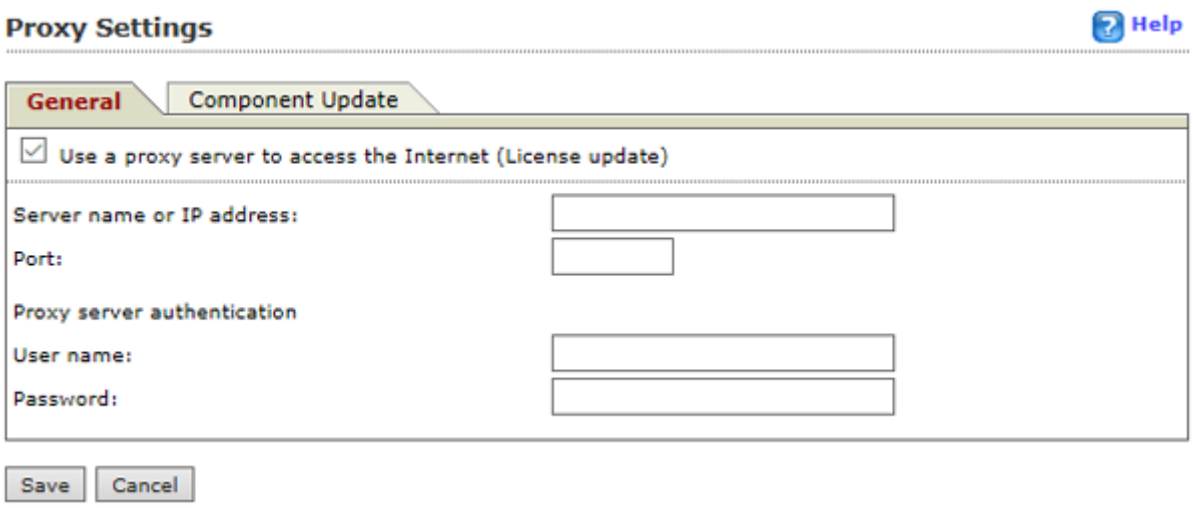
Connecting Through a Proxy Server

If you must pass through a proxy server to connect to the Internet in your network environment, follow this procedure to set the IP address of the proxy server and other settings.

1 From the left-side menu of the Trend Micro NAS Security settings page, click *Administration - Proxy Settings*.



2 Select the "Use a proxy server to access the Internet (License update)" checkbox. Enter the IP address and port of the proxy server, then click *Save*.

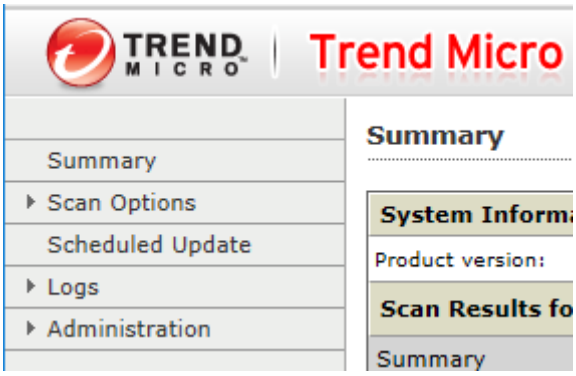


The antivirus software is now configured to use a proxy server.

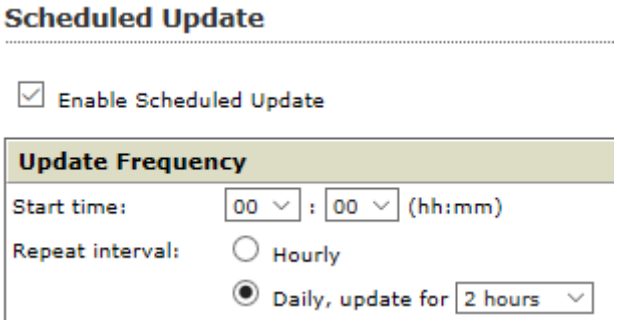
Updating Antivirus Pattern Files

For best results, configure your antivirus software to update the antivirus pattern files automatically as described below.

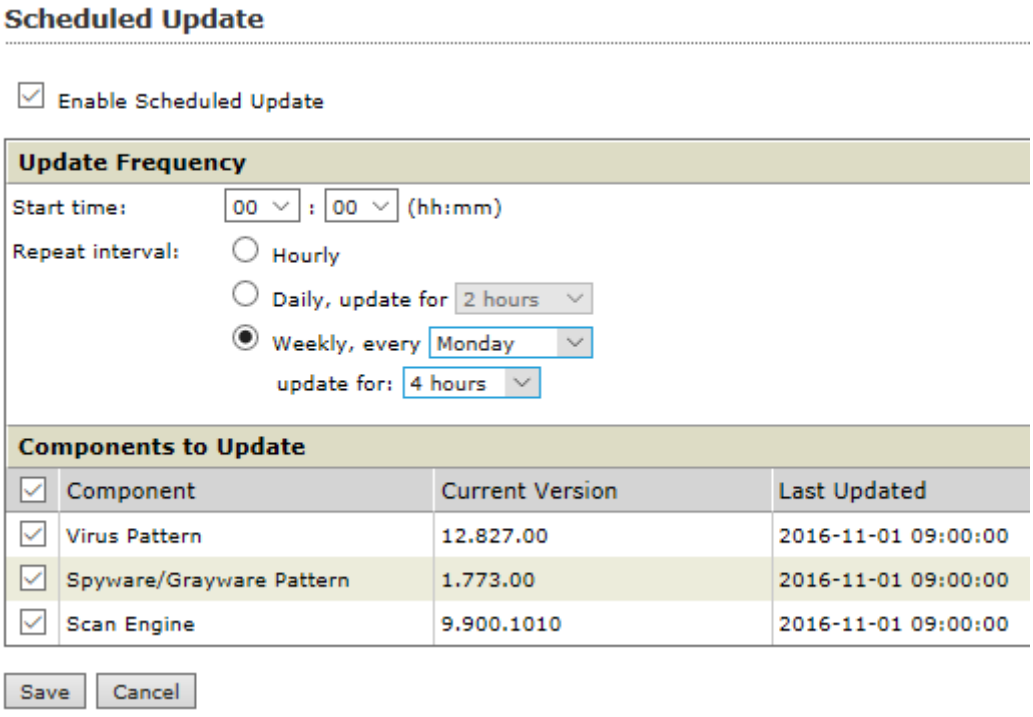
1 From the left-side menu of the Trend Micro NAS Security settings page, choose *Scheduled Updates*.



2 Check "Enable Scheduled Update".



3 Select a time for updates to begin, an interval for updates, and an amount of time for updates to continue. Select the components to update. Click *Save*.

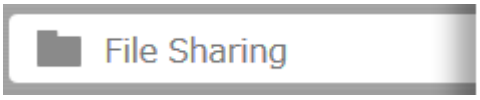


The antivirus software is now configured to update automatically at the scheduled time. Updates will not be downloaded if the TeraStation is turned off, in standby mode, or disconnected from the Internet.

Configuring Folders as Virus Scanning Targets

By default, all folders on the TeraStation (including attached USB drives) will be scanned. Follow the procedure below to block specific shared folders from being scanned.

1 In Settings, click *File Sharing*.

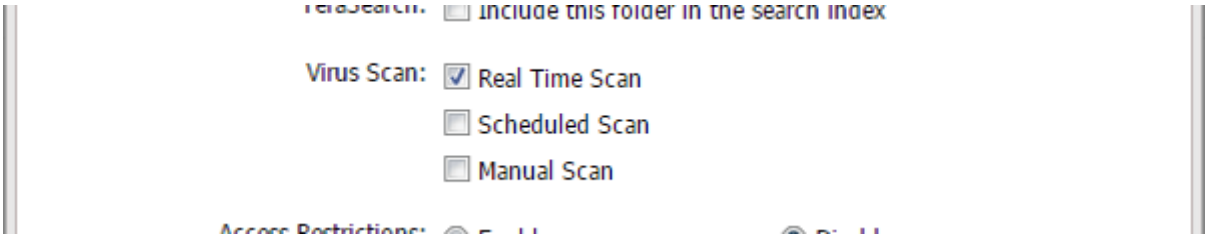


2 Click  to the right of "Folder Setup".



3 Click the shared folder that you want to exclude from the scan, then click *Edit*.

4 If the options' checkboxes are selected, it means the shared folder will be scanned by those scan options. To exclude from the scan, clear the options' checkboxes.



5 Click *OK*.

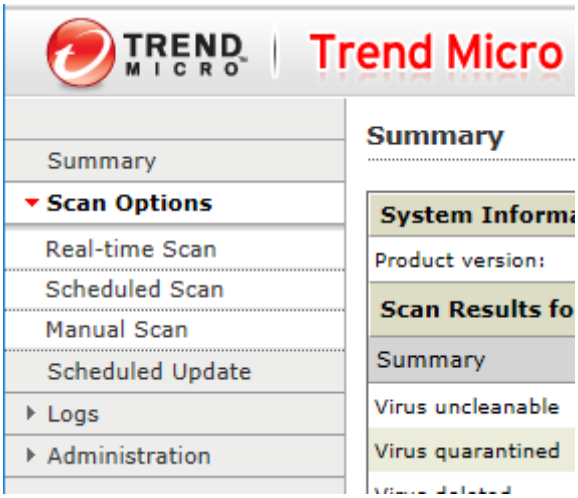
Note: Even if the scan options are selected in the quarantine folder settings, the quarantine folder will be exclude from the virus scan.

Virus Scanning

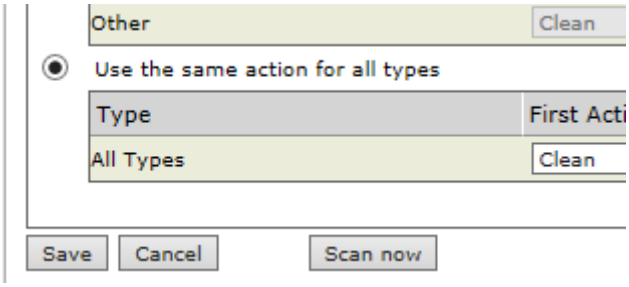
Three types of virus scans are available:

- **Real-time scan**
  The virus scan runs in the background, scanning every file that you read or write. This is the default type of scanning. Your TeraStation may run slower if real-time scanning is enabled.
- **Scheduled scan**
  A scheduled scan is executed at specific regular intervals, such as every Tuesday at 3 a.m.
- **Manual scan**
  A manual scan runs once when initiated. Initiate a manual scan as described below.

1 From the left-side menu of the Trend Micro NAS Security settings page, choose *Scan Options - Manual Scan*.



2 Click *Scan now*. This starts the virus scan.



If the scan finds a virus, the user can be notified in two ways:

- The I34 virus alert message is normally shown on the LCD panel. Once the virus is removed from the quarantine folder, the message is no longer displayed. If the antivirus software is configured to delete viruses from the quarantine folder automatically, then the I34 virus alert message will not be displayed.
- If email notification is enabled in Settings, then the antivirus software notifies the user by email if a virus is found. Enabling email notifications is recommended.

Depending on how many files are on your TeraStation, a virus scan may take several hours. Estimated scanning times are shown below.

10,000 files: ~ 30 minutes

100,000 files: ~ 5 hours

1,000,000 files: ~ 50 hours

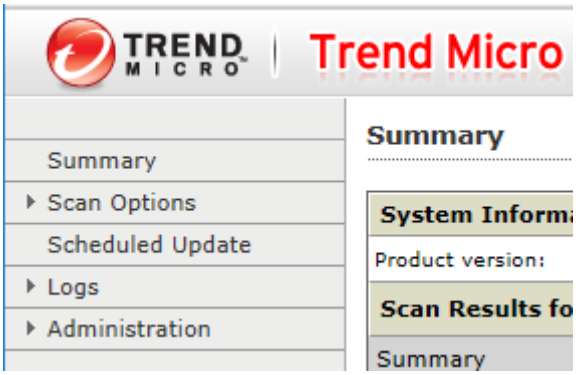
Notes:

- If the quarantine folder doesn't have enough space, the infected files may not be able to be moved to the quarantine folder. The Trend Micro NAS security scan log may identify any infected files as quarantined even if the quarantine did not actually occur. In such a case, remove non-essential files from the quarantine folder and try the virus scan again.
- If the size of the infected file is large, it may not be able to be moved to the quarantine folder. In such a case, check the scan log to see whether the quarantine succeed, and move the infected file to the quarantine folder manually.

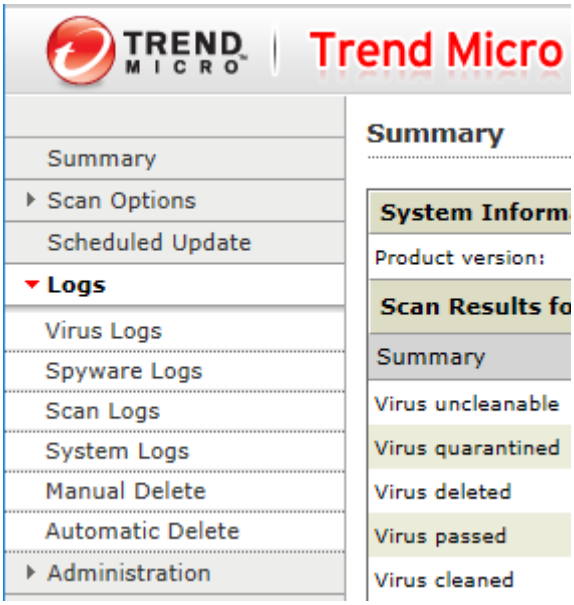
Checking the Log

Follow the procedure below to check the virus scan log.

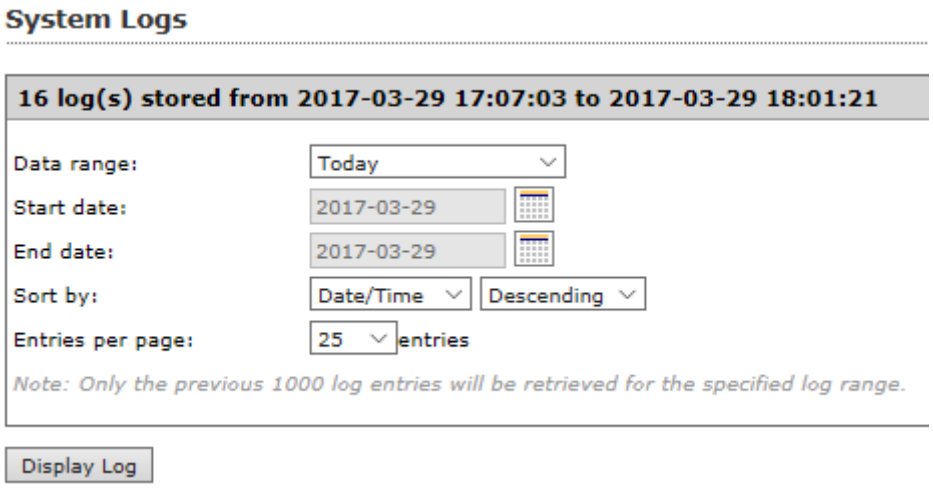
1 From the left-side menu of the Trend Micro NAS Security settings page, choose *Logs*.



2 Click the log item that you want to check.



3 Click *Display Log*.

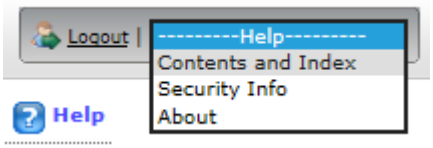


This completes the procedure for checking the log.

Online Help

For more information on the antivirus software, refer to the online help. Follow the procedure below to access the online help.

1 From the right-top menu of the Trend Micro NAS Security settings page, choose *Help - Contents and Index*.



2 Online help will open.

Online help is now ready to use.

Email Notification

Your TeraStation can send you email reports daily, or when settings are changed or an error occurs. You can configure the events that will trigger notifications from any of the following functions:
Drive quota, drives (internal, external, or RAID array), fan, backup, replication, failover, antivirus, system alert, surveillance cameras
Refer to the contextual help in Settings for more detailed information such as when the notification email will be sent or the differences between the notification categories.

1 In Settings, click *Management*.



2 Move the email notification switch to the  position to enable email notification.

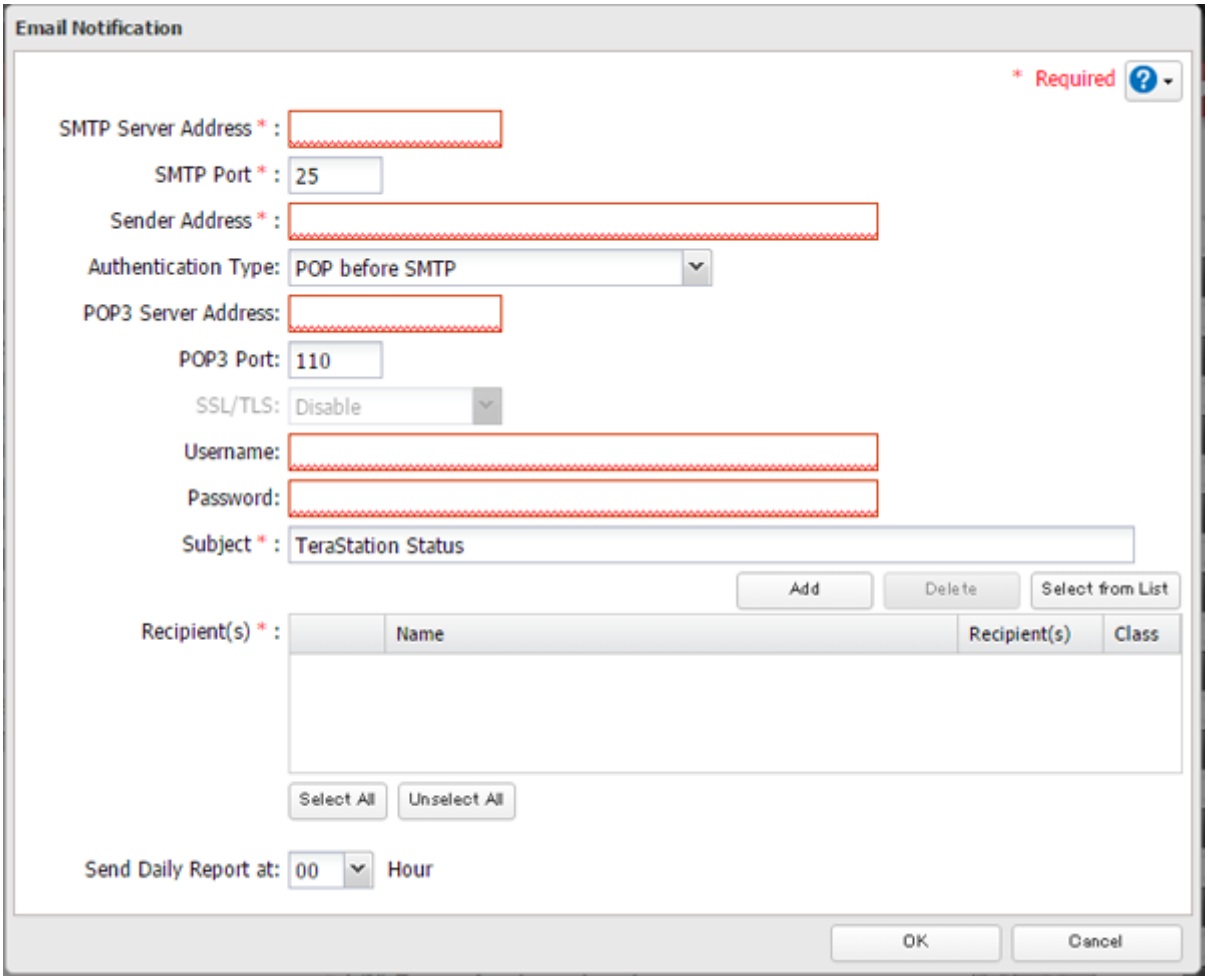


3 Click  to the right of "Email Notification".

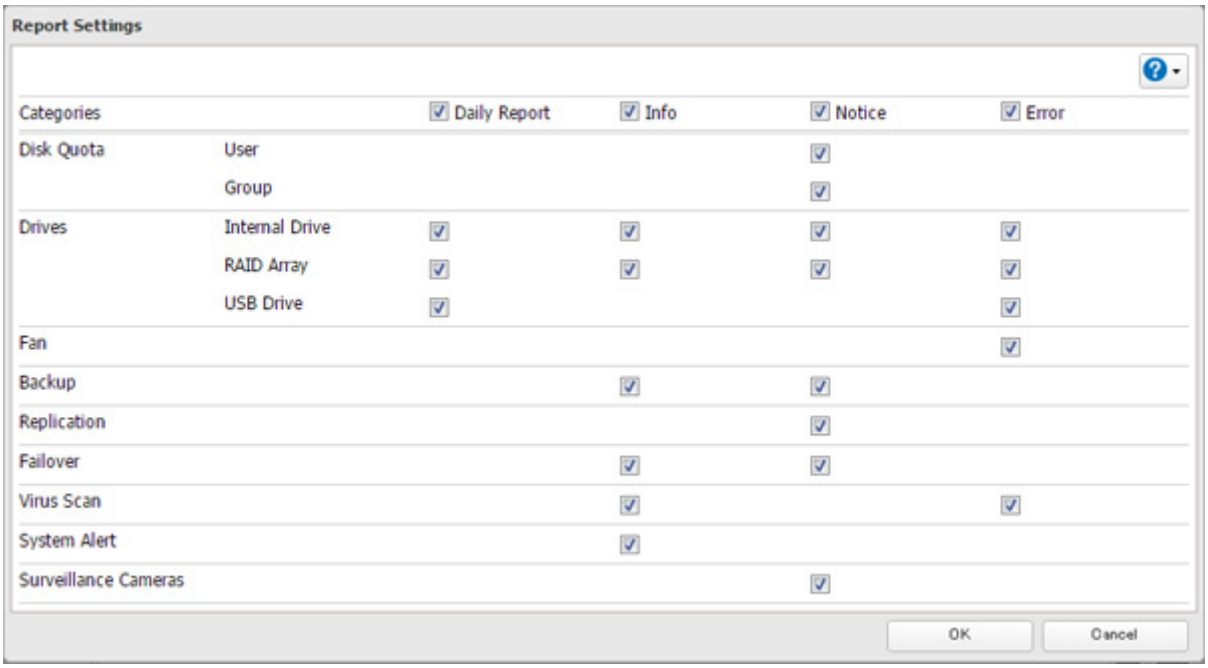
4 Click *Edit*.

5 Enter your email server settings, notification email's default subject, and configure recipients and the time when email reports will be sent. Click *OK* to send a test email.

If you select an authentication type other than "Disable" from the drop-down list, you can enter the sender email address and credentials of the email server.



6 To change the events of email reports, click *Advanced Report Settings*. On the displayed screen, select or clear the category's checkboxes.



The notification emails will be categorized into the following importance levels.

Levels	Details
Daily Report	Describes the status of the TeraStation in a daily report email.
Info	Sends a notification email if an event occurs. Info reports will contain just information such as capacity information, job starts/finishes, etc.
Notice	Sends a notification email if a non-critical error occurs. Notice reports will contain warnings such as something has failed, but the function or unit can continue operating as usual. It is recommended to do the corrective action for the notice as soon as possible.
Error	Sends a notification email if a critical error occurs. Error reports will describe critical failure which prevents a function or unit from operating. It is recommended to do the corrective action to for the error immediately.

Sleep Mode

To save energy, you can specify times to put the TeraStation into sleep (standby) mode, during which the hard drive and LEDs are turned off.

1 In Settings, click *Management*.

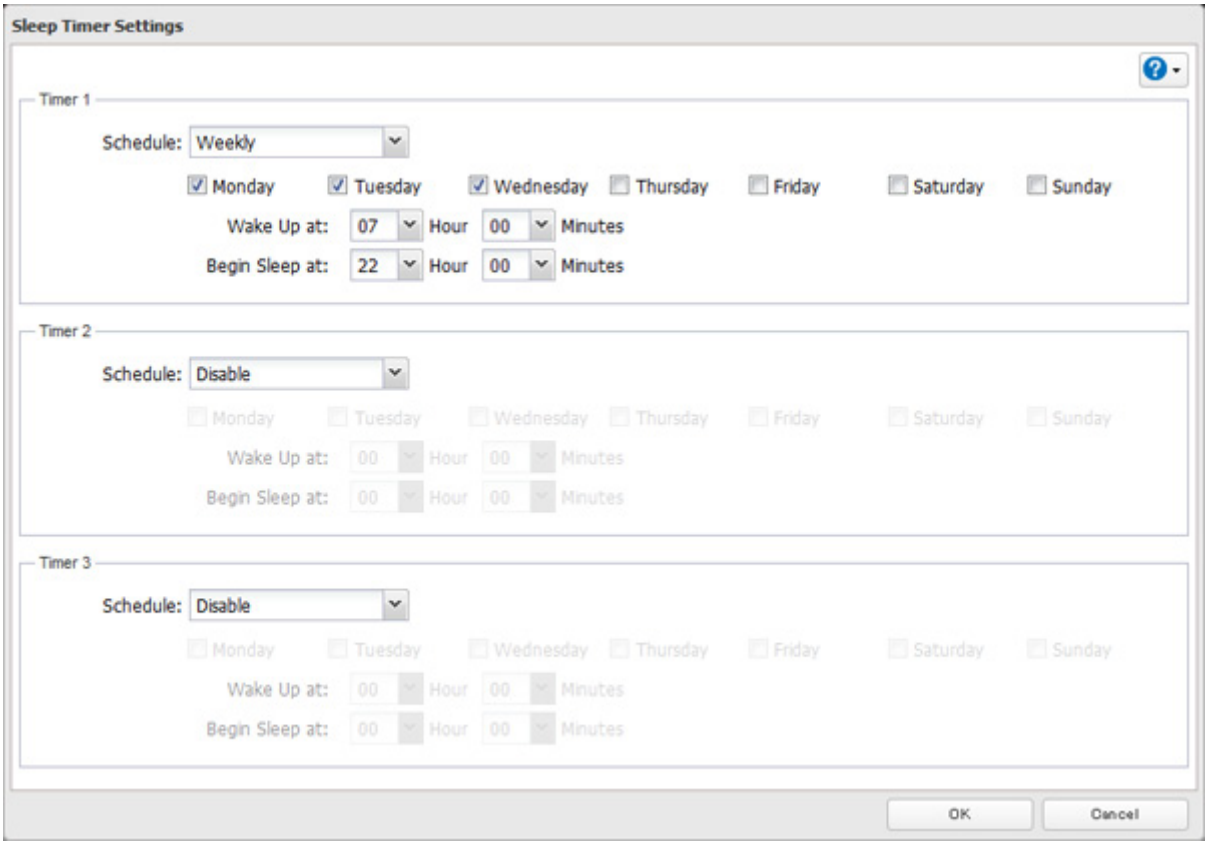


2 Click  to the right of "Sleep Timer".



3 Click *Edit*.

4 Specify the timer interval, wake-up time, and time to go into sleep mode, then click *OK*.



Notes:

- Up to three timers can be set.
- The time to enter sleep mode can be set from 12:00 a.m. to 3:45 a.m. of the next day. The time to wake from sleep mode can be set from 12:00 a.m. to 11:45 p.m. If the time to enter sleep mode is after 12:00 a.m., the wake-up time setting may be from 4:00 a.m. to 11:45 p.m.
- The time to enter sleep mode should not be set at the same time as or before the start time.
- If a timer is scheduled during a drive check, drive format, backup process, and backup job, or within 5 minutes of the current time, the TeraStation will not change to standby mode when the configured time is reached.
- If scheduled times in the timer overlap, operation is performed using the widest time interval.
- Examples of multiple timer settings are shown below.
  Example 1:
  If running at a current time of 10:00 a.m. Wednesday
  Timer 1: Daily 12:00–24:00
  Timer 2: Not used
  Timer 3: Not used
  No operation is performed at 12:00 p.m. and the unit goes into sleep mode at 12:00 a.m.
  Example 2:
  If running at a current time of 10:00 a.m. Wednesday
  Timer 1: Daily 9:00–18:00
  Timer 2: Wednesday 10:00–20:00
  Timer 3: Not used
  On days other than Wednesday, normal operation begins at 9:00 a.m. and the unit goes into sleep mode at 6:00 p.m. On Wednesday, the unit goes into sleep mode at 8:00 p.m.
  Example 3:
  If running at the current time of 10:00 a.m. Wednesday
  Timer 1: Daily 9:00–18:00
  Timer 2: Wednesday 10:00–1:00 a.m. of the next day
  Timer 3: Not used

On days other than Wednesday, normal operation begins at 9:00 a.m. and the unit goes into sleep mode at 6:00 p.m. On Wednesday, normal operation begins at 10:00 a.m. and the unit goes into sleep mode at 1:00 a.m. of the next day.

Example 4:

If running at a current time of 10:00 a.m. Wednesday
Timer 1: Daily 9:00–18:00
Timer 2: Wednesday 7:30–22:00
Timer 3: Not used
On days other than Wednesday, normal operation begins at 9:00 a.m. and the unit goes into sleep mode at 6:00 p.m. On Wednesday, normal operation begins at 7:30 a.m. and the unit goes into sleep mode at 10:00 p.m.

- To wake the TeraStation from sleep mode manually, press the power button.

Wake-on-LAN

The TeraStation supports Wake-on-LAN, which allows it to be turned on remotely.

1 In Settings, click *Network*.

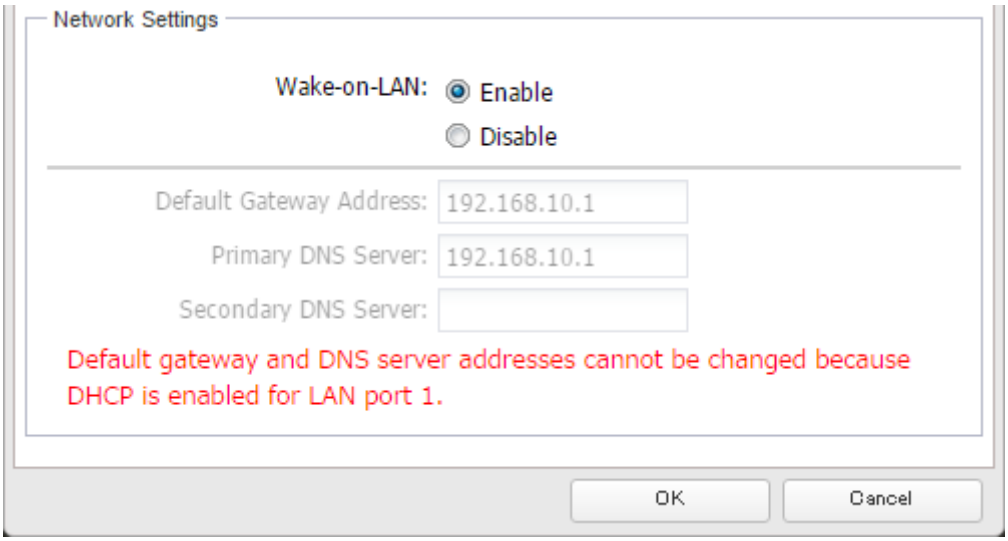


2 Click  to the right of "IP Address".



3 Click the LAN port that will receive Wake-on-LAN packets.

4 Enable "Wake-on-LAN", then click *OK*.



Wake-on-LAN is now enabled. As long as the TeraStation is connected to a power source and the network, you can turn it on remotely.

Notes:

- After a power outage, wait 5 minutes after power is restored to send the Wake-on-LAN packet to the TeraStation.
- After receiving the Wake-on-LAN packet, the TeraStation may take approximately five minutes to be ready to use.
- To use Wake-on-LAN, you'll need Wake-on-LAN software that sends magic packets. The TeraStation does not include Wake-on-LAN software.

- The TeraStation does not support using Wake-on-LAN and port trunking at the same time. You may use either feature, but not both at the same time.
- On the local network, Wake-on-LAN packets may be sent to port 2304 on either of the TeraStation's LAN ports. If the TeraStation is connected to a Buffalo wireless router configured for remote access, then it may be turned on from outside the local network (from the WAN side). To use this feature, connect the router to only LAN port 1 on the TeraStation.

UPS (Uninterruptible Power Supply)

If a UPS (sold separately) is attached, the TeraStation can be automatically shut down to protect data in the event of a power outage.

1 Plug the power cable of the UPS to a wall socket.

2 Connect the power cable of the TeraStation to the UPS.

3 Connect the UPS and TeraStation using a USB cable or serial cable.

4 Turn on the UPS, then the TeraStation.

5 In Settings, click *Management*.

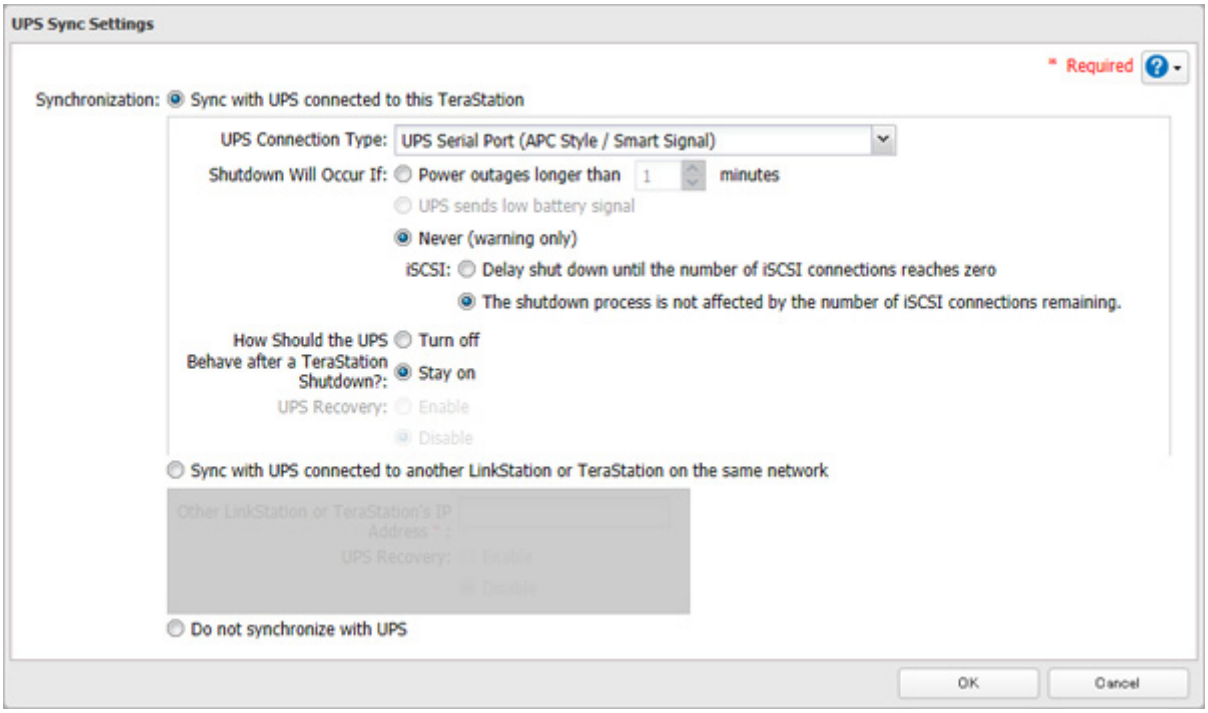


6 Click  to the right of "UPS Sync".



7 Click *Edit*.

8 Configure the desired settings, then *OK*.



Notes:

- If the TeraStation is connected directly to a UPS, select "Sync with UPS connected to this TeraStation". If a different TeraStation is connected to the UPS, select "Sync with UPS connected to another LinkStation or TeraStation on the same network". After making this selection, enter the IP address of the TeraStation that will be the sync source into "Other LinkStation or TeraStation's IP Address".
- When the TeraStation is turned on after an automatic shutdown such as from a power outage or power supply problem, verify that the power supply has been restored and a minute passed since the power supply was restored. If the TeraStation is turned on while it is still running on the UPS and without the power supply restored, automatic shutdown is not performed, even after the specified time has elapsed.
- If the power supply from the UPS to the TeraStation is stopped and restarted when UPS recovery is enabled, the TeraStation is automatically restarted.

Port Trunking

Two Ethernet cables can be used to establish two separate communication routes, providing LAN port redundancy and improving communication reliability. The use of two Ethernet cables enables access to the TeraStation even if one of the cables is disconnected.

The port trunking modes that can be set in the TeraStation are shown below.

Trunking Mode	Characteristics
Round-robin*	Network packets are transmitted in sequential order from the first available NIC slave through the last.
Active-backup	Only one NIC slave in the bond is active. A different slave becomes active if and only if the active slave fails.
XOR*	Transmits network packets based on [(source MAC address XOR'd with destination MAC address) modulo NIC slave count]. This selects the same NIC slave for each destination MAC address.
Broadcast	Transmits network packets on all slave network interfaces.
Dynamic link aggregation	Creates aggregation groups that share the network speed and duplex settings. Utilizes all slave network interfaces in the active aggregator group according to the 802.3ad specification. To use this mode, a separate intelligent switch that supports IEEE 802.3ad is required. Configure LACP in the switch first.
TLB	The outgoing network packet traffic is distributed according to the current load (relative to the speed) on each network interface slave.

* A separate intelligent switch that supports EtherChannel or other port trunking is required. Configure two LAN ports on the switch for port trunking first.

Note: If the TeraStation is being used as an iSCSI hard drive, disable iSCSI before changing network settings such as port trunking. Navigate to *Drives - iSCSI* in Settings and move the iSCSI switch to the "off" position temporarily.

1 Use an Ethernet cable to connect the hub LAN port and TeraStation LAN port 1.

Notes:

- Do not connect the second Ethernet cable to the TeraStation yet.
- If using an intelligent switch, configure the LAN ports on the switch first, before connecting to the TeraStation.

2 In Settings, click *Network*.

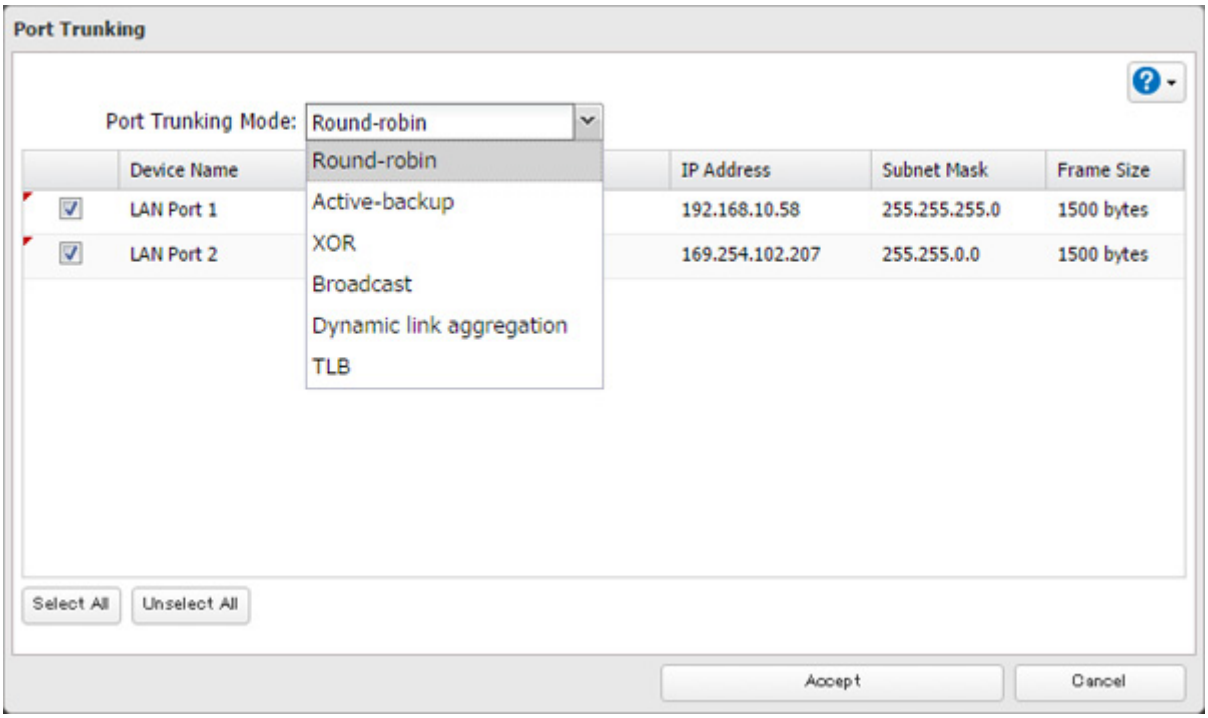


3 Click  to the right of "Port Trunking".



4 Choose a port trunking link.

5 Select the LAN port that will be used, select the port trunking mode, and click *Accept*.



6 Connect the hub's LAN port and TeraStation's LAN port using the second LAN cable. If you are using an intelligent switch, connect to the LAN port that was previously configured for port trunking.

7 Restart the TeraStation before use.

Connecting a Printer

You can connect a printer to the USB port on the TeraStation.

Notes:

- Only one USB printer can be connected to the TeraStation.
- Bidirectional communication is not supported i.e., remaining ink quantities and other printer status information is not displayed.
- If a multifunctional printer is connected, only the printer function can be used. Other functions such as scanning will not be available.
- The print server does not support macOS.
- Don't disable the SMB protocol while the print server is enabled. If you do, you will need to enable SMB again and reconfigure the print server from scratch.

1 In Settings, click *Services*.



2 Move the print server switch to the  position to enable the print server.



3 Refer to the manual supplied with the printer and install the printer drivers.

4 Launch NAS Navigator2. Double-click your TeraStation's icon.

5 Double-click the icon of the connected printer (shared name is displayed).

6 Click *OK*.

7 Select your printer, then click *OK*.

8 Register the printer.

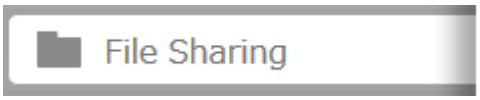
TeraSearch

TeraSearch lets you locate files stored on the TeraStation. There are two search methods: you can either search by the text content contained in files, or search by specifying the filename, owner, date updated, and/or file size. TeraSearch can only search for Microsoft Office files, OpenDocument files, PDF files, HTML files, and text files. Other file types, such as music or movie files, are not compatible with TeraSearch. Refer to the chart below for all file types supported by TeraSearch.

File Type	Filename Extensions
Microsoft Office files	.doc, .docx, .docm, .xls, .lxsx, .xlsm, .ppt, .pptx, .pptm, .ppsx, .ppsm
OpenDocument files	.odt, .ods, .odp, .odg, .odc, .odf, .odi, .odm, .odb
PDF files	.pdf
HTML files	.html, .htm
Text files	.txt

Follow the procedure below to enable it.

1 In Settings, click *File Sharing*.



2 Click  to the right of "Folder Setup".



3 Click the shared folder to be indexed.

4 Click *Edit*.

5 Check "Include this folder in the search index", then click *OK*.

6 Click *OK*.

7 Click *Close*.

8 Click *Applications*.

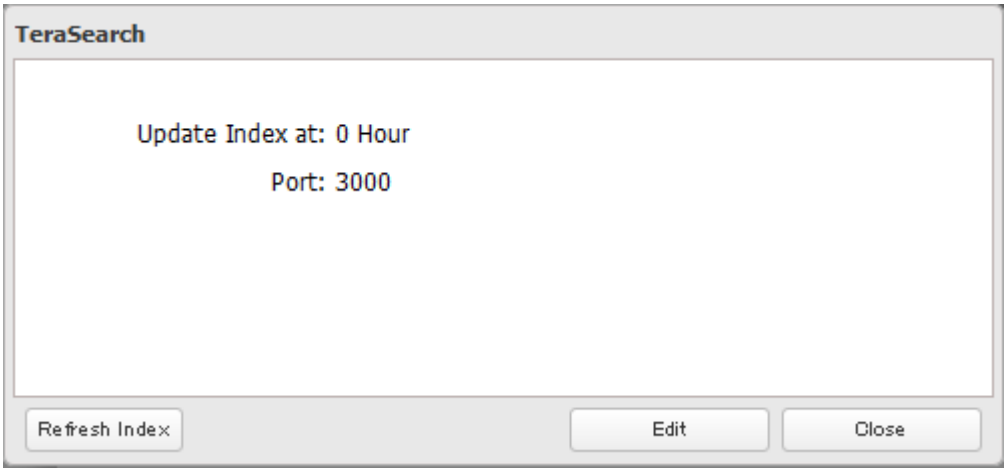


9 Move the TeraSearch switch to the  position to enable TeraSearch.



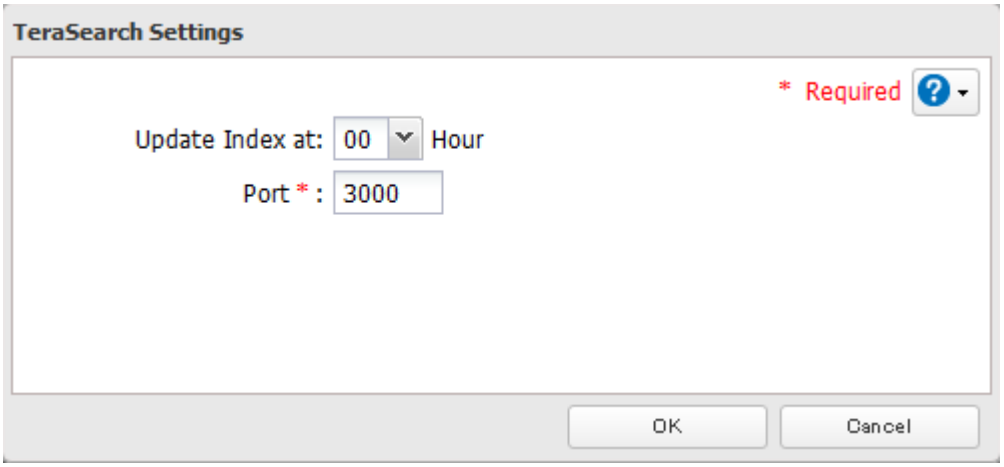
10 Click  to the right of "TeraSearch".

11 Click *Refresh Index*.



12 Click *Edit*.

13 Enter the port number that you want to use and the time that the index will be updated, then click *OK*.



14 Open the following URL in your browser.
http://(IP address of your TeraStation):3000/

15 Enter your TeraStation's username and password, then click *Login*.

16 Enter a keyword into the "Search Text" field. To search by other parameters such as filename or file size, check "Advanced Search".

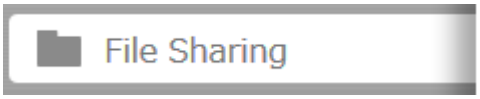
17 Click *Search*. The search results are displayed. Click the filename in the results to open the file.

Note: If the TeraStation hostname contains hyphens (-) or underscores (_), TeraSearch may not work properly.

Offline Files

The "offline files" feature that is included with many versions of Windows can be used with files on the TeraStation. You will be able to work on files stored on the TeraStation even when your PC is disconnected from the network. When you next connect to the network, the updated files are written and synchronized. Follow the procedure below to configure offline files.

1 In Settings, click *File Sharing*.



2 Click  to the right of "Folder Setup".



3 Click the shared folder for offline files.

4 Click *Edit*.

5 Choose "Manual File Caching", "Automatic File Caching", or "Automatic Program and File Caching", then click *OK*.

- "Manual File Caching" - User selects files that are cached.
- "Automatic File Caching" - Opened files can be cached locally for offline use. Previous versions of files that are not synchronized are automatically replaced by the latest versions.
- "Automatic Program and File Caching" - Opened files can be cached locally for usage offline. Previous versions of files and applications executed from the network that are not synchronized are automatically replaced by the latest version of the files and applications.

6 Click *OK*.

7 Click *Close*.

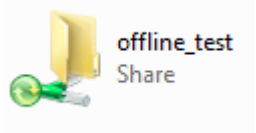
8 In Windows, navigate to *Folder options* (for users who are using Windows Vista or later, skip to step 9).

9 Check "Enable Offline Files", then click *OK*.

Note: Offline files cannot be enabled if "Use Fast User Switching" is enabled. To change the setting, open "User Accounts" in Control Panel and select "Change the way users log on or off".

10 Right-click the icon of the shared folder on the TeraStation for which you have set the offline feature, then click *Always available offline*. If the offline file wizard opens, follow the procedure on the screen.

11 When the offline settings and sync settings are completed, the files and folders set appear as shown:



12 If the computer is disconnected from the network after synchronization is completed, the offline file function can be used.

Offline files can be accessed by the original Universal Naming Convention (UNC) where the data was saved.

Note: If you cannot access offline files, try the following procedure:

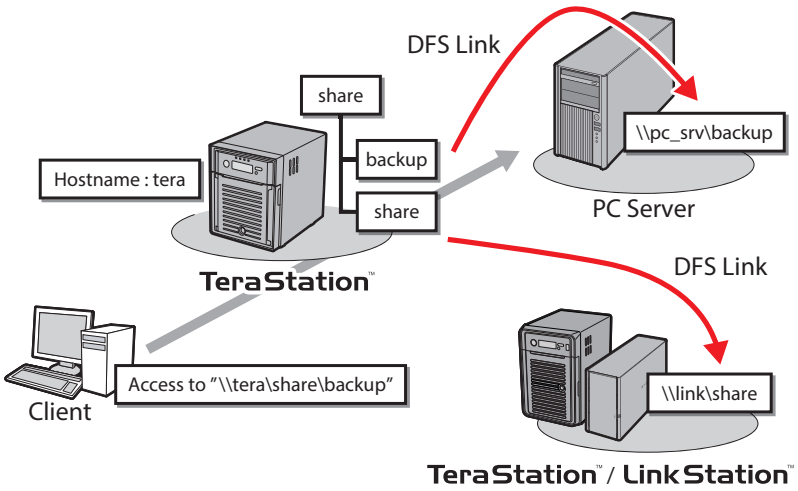
(1) Reconnect the computer to the network.

(2) In Control Panel, change the view to the icon view and click *Sync Center*. Click *Sync All* to synchronize all offline files.

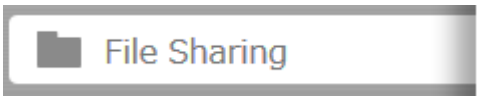
(3) Disconnect the computer from the network and verify that you can access offline files.

DFS

DFS (Distributed File System) is a set of client and server services that allows Windows users to organize many distributed SMB file shares into a distributed file system. Follow the procedure below to enable DFS on the TeraStation.



1 In Settings, click *File Sharing*.



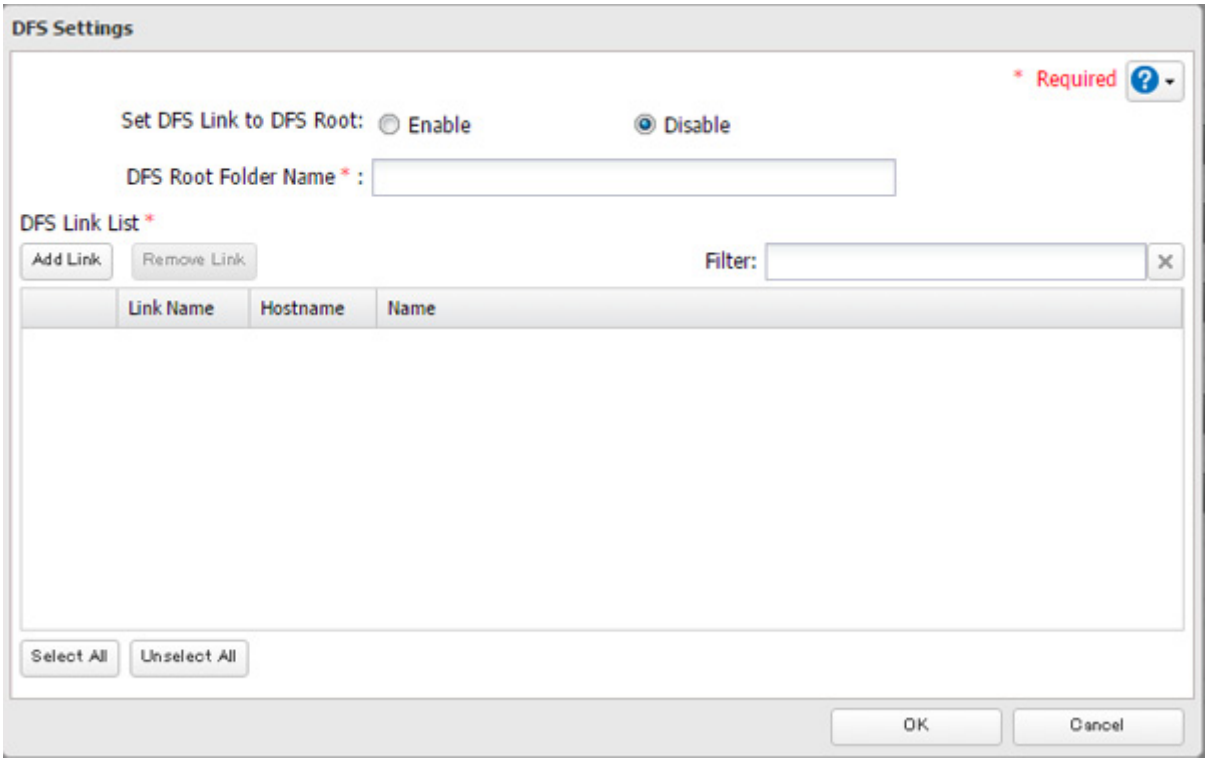
2 Click  to the right of "DFS".



3 Click *Edit*.

4 Enable or disable "Set DFS Link to DFS Root".

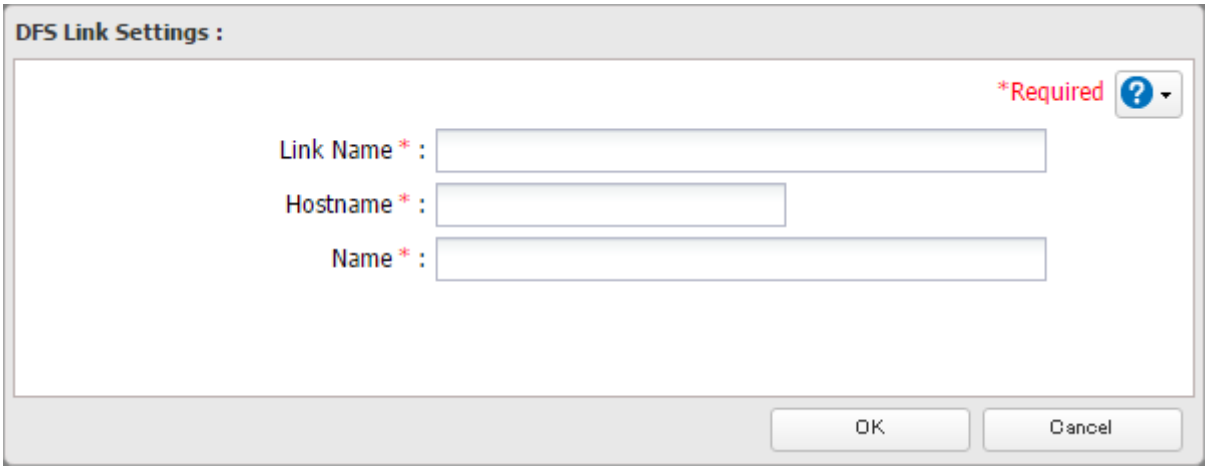
If enabled, a DFS link target shared folder is created under the DFS root. If disabled, up to 8 DFS link target shared folders can be created under the DFS root.



5 Enter *DFS Root Folder Name*.

6 Click *Add Link*.

7 Enter the link name, hostname, and shared folder name, then click *OK*.



8 Click *OK*.

9 Move the DFS switch to the  position to enable DFS.



Notes:

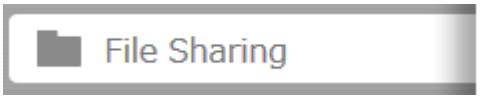
- Don't disable the SMB protocol while DFS is enabled. If you do, you will need to enable SMB again and reconfigure DFS from scratch.

- TeraStations, LinkStations, and SMB-compatible Windows computers can be specified as DFS link targets (macOS and Linux are not supported).

Accessing from an NFS Client

Note: (US customers only) Buffalo's customer support will help configure the NFS settings on your TeraStation, and will support VMware and Windows clients but will not provide support for configuring your Linux or other UNIX clients. There are many types of UNIX and the procedure for configuring NFS with them will vary considerably. For help configuring your NetWare, Linux, or other UNIX clients for NFS support, please consult each client's own documentation and support.

1 In Settings, click *File Sharing*.



2 Click  to the right of "Folder Setup".



3 Choose the shared folder that will be accessible for the NFS client.

4 Click *Edit*.

5 Under "LAN Protocol Support", select the "NFS" checkbox and click *OK*.
Note the NFS path. It will be used later for accessing data from an NFS client.

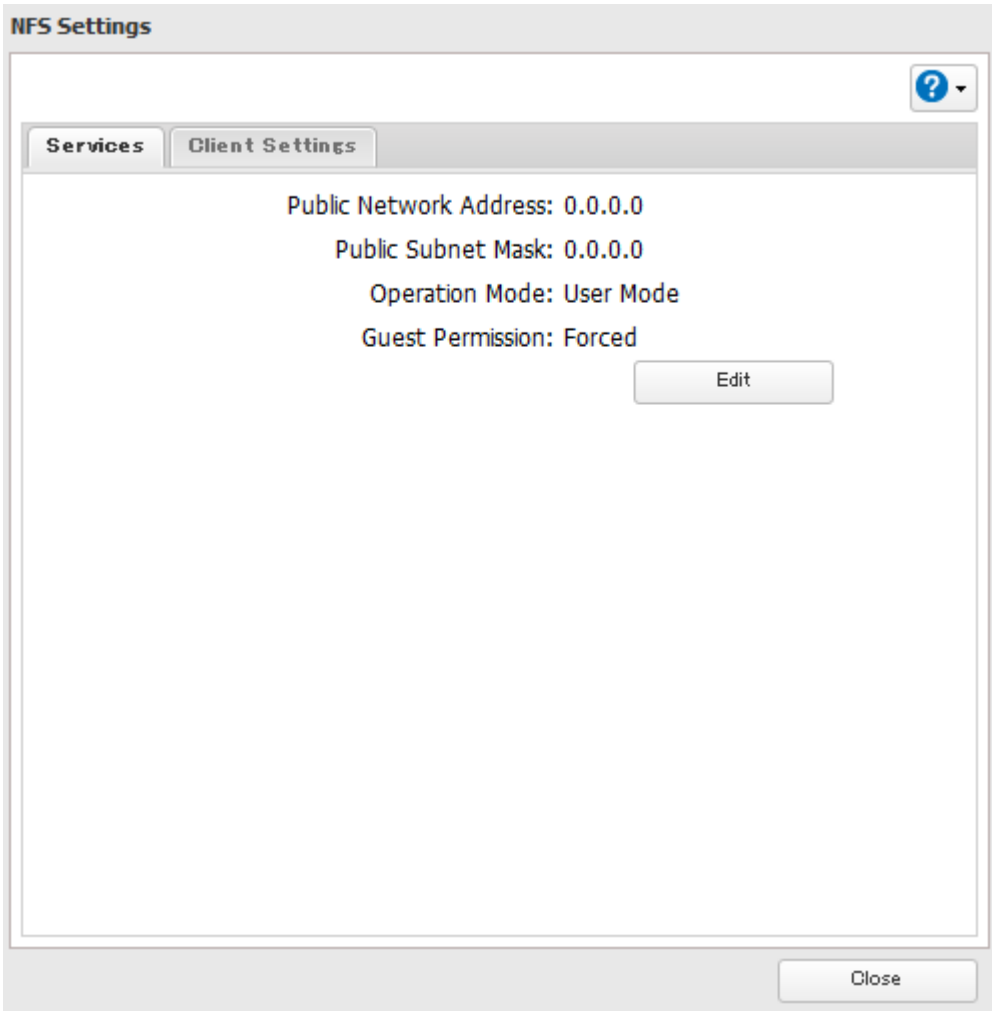
6 Click *Close*.

7 Move the NFS switch to the  position to enable NFS.

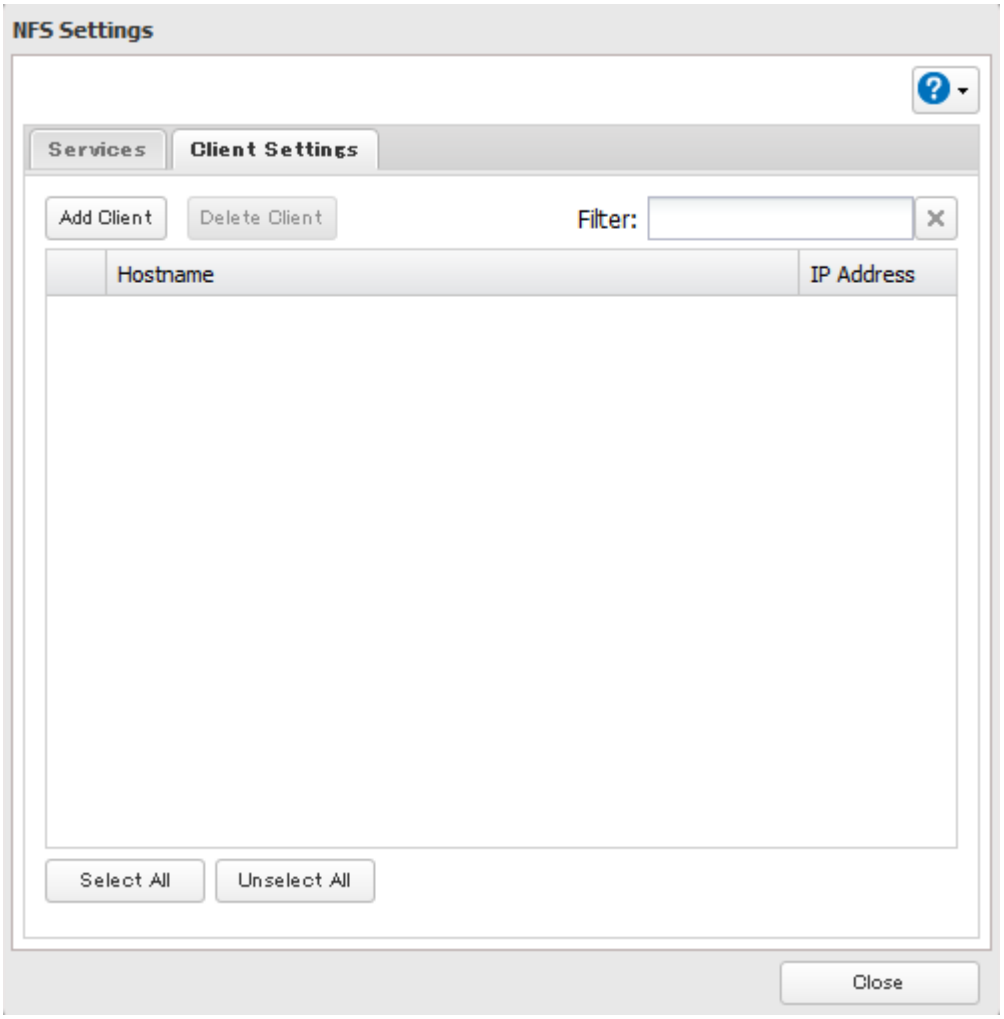


8 Click  to the right of "NFS".

9 Click the *Client Settings* tab.

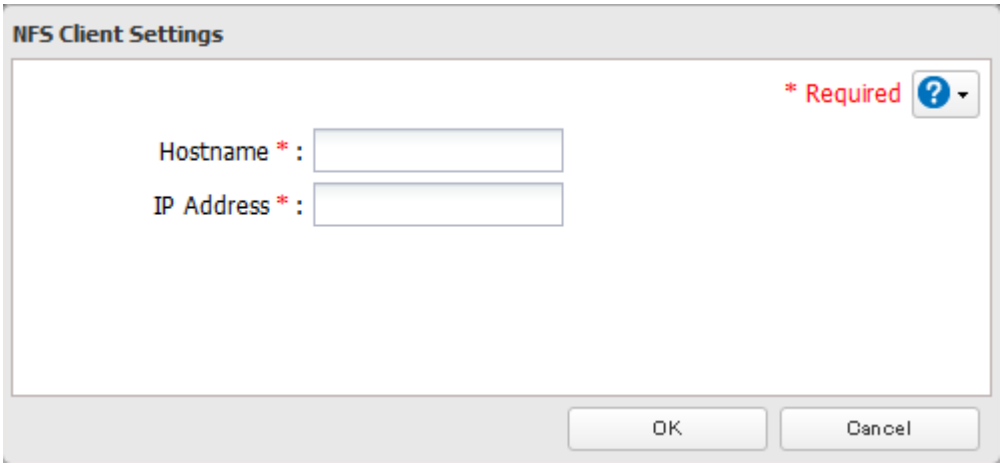


10 Click *Add Client*.



Note: To delete a client, select the checkboxes of the clients in the list and click *Delete Client*.

11 Enter the IP address and hostname of the NFS client, then click *OK*. You should add all NFS clients to access the shared folder.



Notes:

- To restrict NFS access to a specific network or client, navigate to *File Sharing - NFS - Services* and click *Edit*. Enter the address of the network. For example, if your local network subnet has a router at 192.168.1.1 and clients with IP addresses in the range from 192.168.1.2 through 192.168.1.48 with subnet mask 255.255.255.0, then the "Public Network Address" would be 192.168.1.0 and the "Public Subnet Mask" would be 255.255.255.0. This would mean that only clients on this local network would be able to access the NFS share. If the default settings are used

(0.0.0.0 for both the public network address and the public subnet mask), then access to the NFS share will not be restricted.

- To use shared folders set for NFS as drives on VMware ESX/ESXi, change the operation mode from "User Mode" (default setting) to "Kernel Mode" on the screen navigating to *Services - Edit*.
- If you configure "Guest Permission" to "Forced" on the screen navigating to *Services - Edit*, user ID and group ID should be 99 when the data is written from NFS clients; this is recommended for SMB or other protocols as well. Use "Ignored" if the TeraStation only enables NFS connection.

NFS Mount Commands

Enter the mount command to access the shared folder from the NFS client. The mount command depends on your operating system. The examples below assume that IP address of your TeraStation is 192.168.11.10, "/mnt/array1/share" is the desired NFS path, and "/mnt/nas" or drive letter "z" is the mount point.

For Linux:

mount -t nfs 192.168.11.10:/mnt/array1/share /mnt/nas

For Windows Service for Unix 3.5:

mount 192.168.11.10:/mnt/array1/share z:

For Solaris 10:

mount -F nfs 192.168.11.10:/mnt/array1/share /mnt/nas

For macOS (NFS is working in kernel mode):

mount -t nfs -o resvport 192.168.11.10:/mnt/array1/share /mnt/nas

Encrypting Data Transmission

Encrypting Settings Data

All communication with Settings can use SSL encryption if you access the Settings page by changing "http://" to "https://" in the browser address bar or click *Secure Connection* from the login window. Once you are logged in using the HTTPS connection have disabled SSL encryption, click *Normal Connection* from the login window.

Encrypting FTP Transfer Data

Using SSL/TLS Encryption

You can encrypt passwords and files using SSL/TLS for secure FTP communication. First, open a shared folder's settings and click *Edit*; under "LAN Protocol Support", select the "FTP" checkbox and click *OK*. Enable SSL security in the setup screen for your FTP client. The procedure depends on the FTP client software.

Using SSH Encryption

You can encrypt passwords using SSH for secure FTP communication. First, open a shared folder's settings and click *Edit*; under "LAN Protocol Support", select the "SFTP" checkbox and click *OK*. Also, you have to enable the SFTP service by moving the SFTP switch to the "on" position on "File Sharing".

SSL Keys

SSL keys are used during setup screen operations and FTP communication. SSL (Secure Socket Layer) is a type of encryption system called public key encryption. Generally, SSL is managed by the two files below.

server.crt (SSL Certificates)

The TeraStation sends the file to a computer, and the computer uses it to perform encryption. The TeraStation receives the encrypted data and uses server.key (the private key) to decrypt the data.
In SSL, this key contains the server certificate, and depending on your computer environment, a check may be performed to determine the trustworthiness of the certificate. The server certificate included in the TeraStation in the default settings was created by Buffalo, and in some cases the message "There is a problem with this website's security certificate" may be displayed in your browser or other software. Disregard this message and continue.

server.key (SSL Private Key)

This file is used as a pair with server.crt (server certificate). This is required for decrypting the data that was encrypted by the server certificate, and this is normally not revealed.
Note: The passphrase for the private key must be removed before importing to the TeraStation.

Updating SSL Key Files

To update a server certificate and a private key for SSL, follow this procedure.

1 In Settings, click *Management*.

2 Click *SSL*.

3 Register "server.key" for "Secret Key" and "server.crt" for "Server Certificate (.crt)", then click *Import*.

Notes:

- Place the SSL key files (server.key, server.crt) directly below the C root drive. The SSL key files may not be able to be updated if it is placed in folders or paths that contain multibyte characters.
- If Settings cannot be displayed after updating, initialize the TeraStation settings.
- Updating the firmware initializes an SSL key.

Web Server

The TeraStation can be used as a web server. In addition to HTML files, images, and JavaScript, the TeraStation also allows installation of Perl script and PHP script files.

1 In Settings, click *Services*.

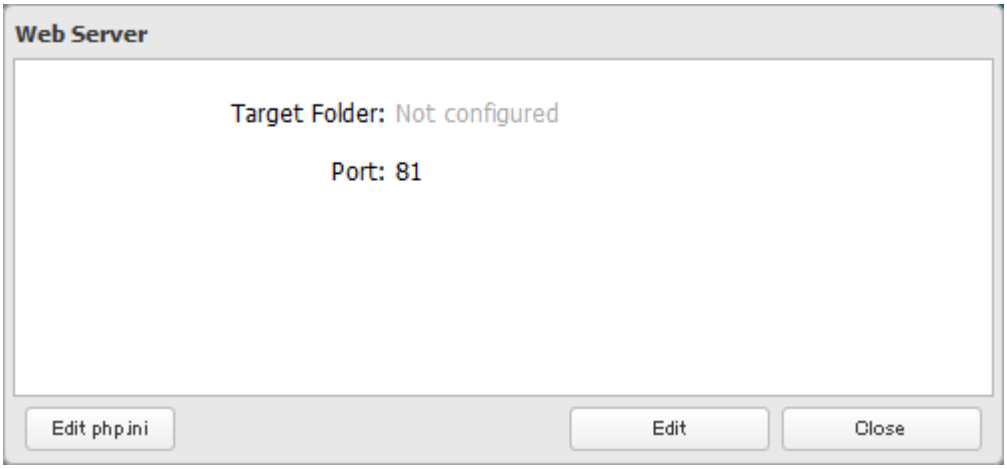


2 Move the web server switch to the  position to enable the web server.



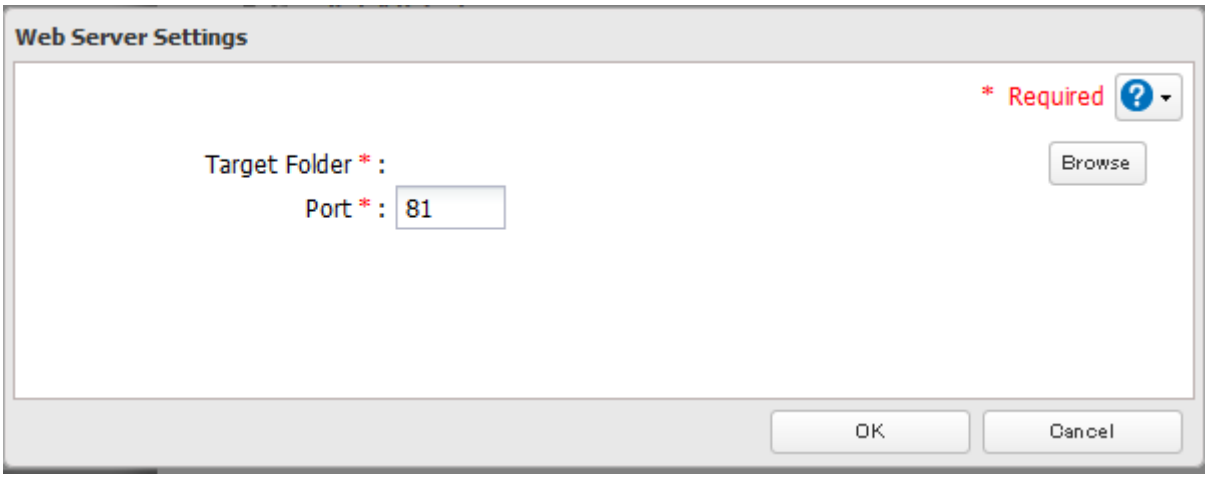
3 Click  to the right of "Web Server".

4 Click *Edit*.

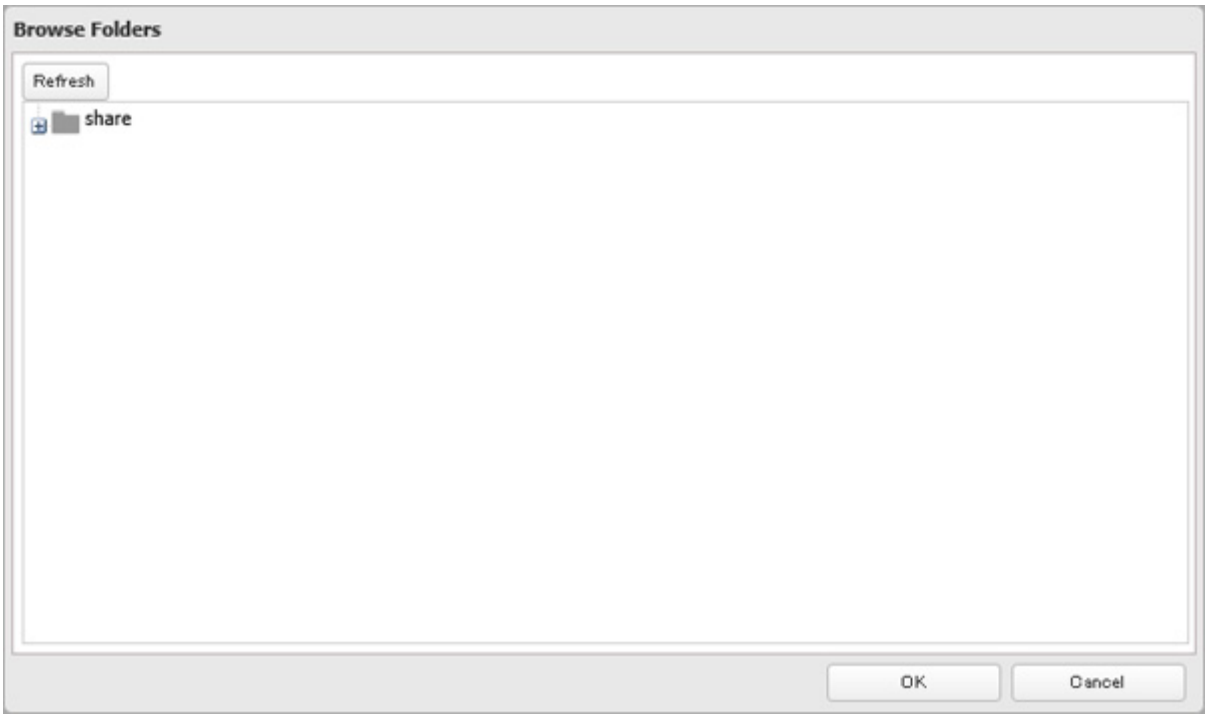


Note: The settings of the PHP language interpreter can be changed from "Edit php.ini".

5 Click *Browse*.



6 Choose a shared folder for the web server, then click *OK*.



7 Choose an external port, then click *OK*.

MySQL Server

The TeraStation can be used as a MySQL server. A MySQL database may be installed and linked with the web server.

1 In Settings, click *Services*.



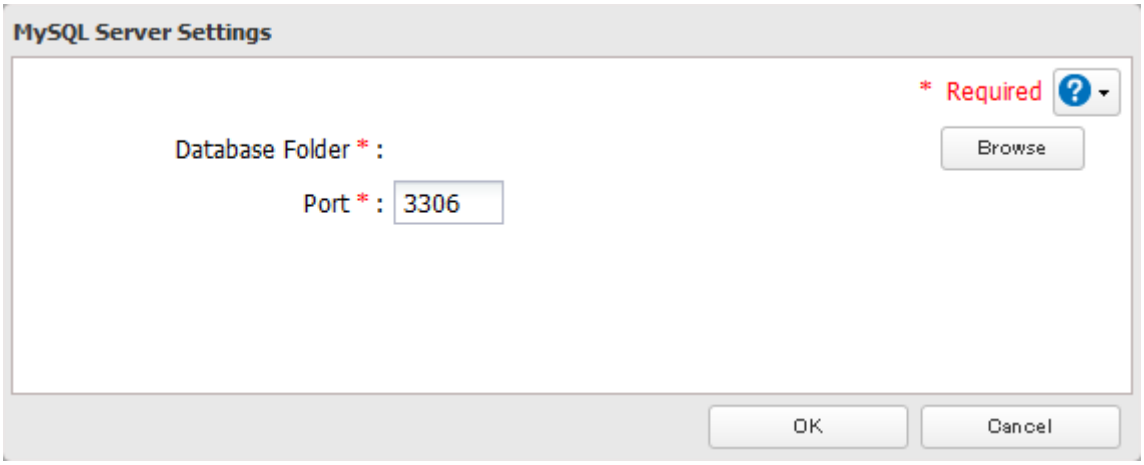
2 Move the MySQL server switch to the  position to enable the MySQL server.



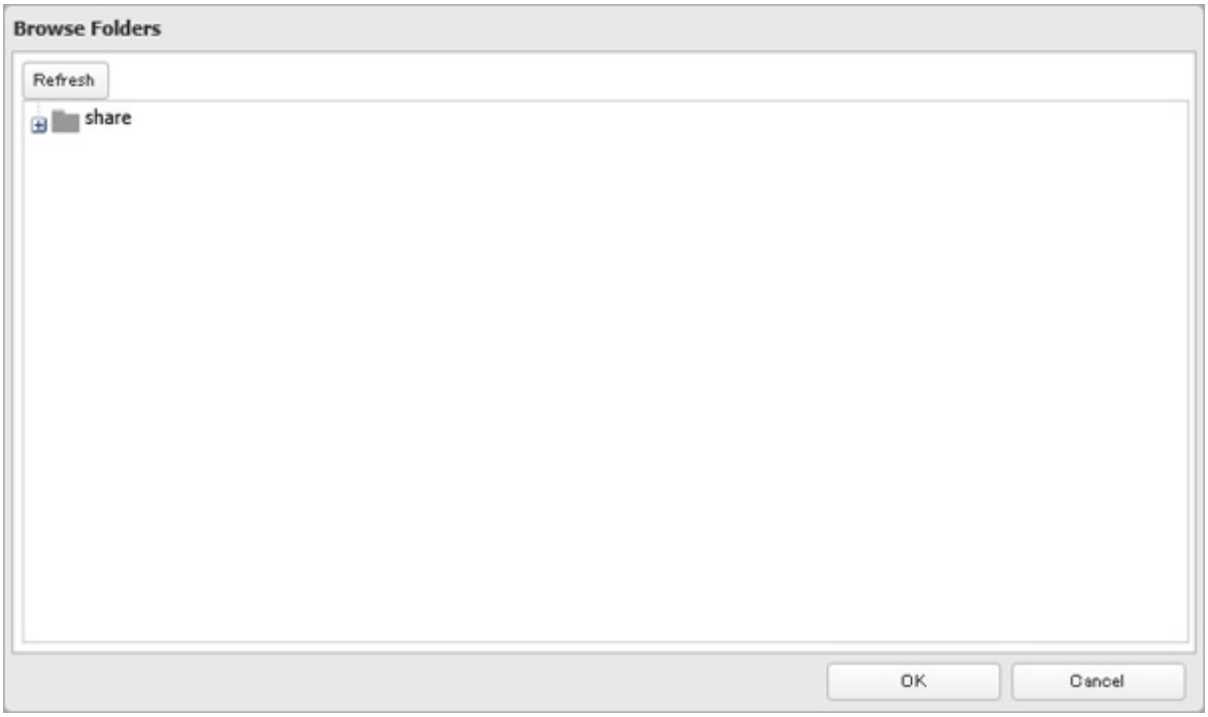
3 Click  to the right of "MySQL Server".

4 Click *Edit*.

5 Click *Browse*.



6 Choose a shared folder for the MySQL server, then click *OK*.



7 Choose an external port, then click *OK*.

SNMP

If SNMP is enabled, you can browse your TeraStation from SNMP-compatible network management software.

1 In Settings, click *Network*.

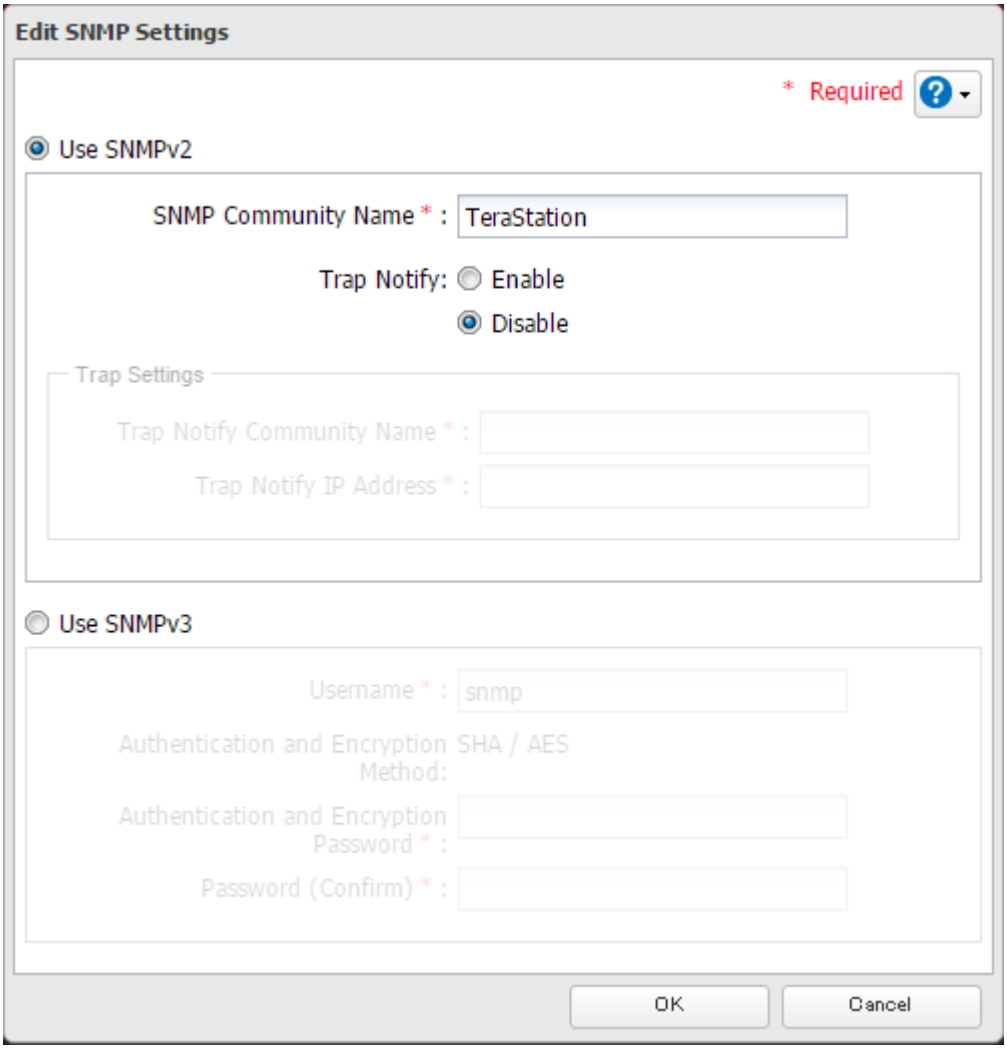


2 Click  to the right of "SNMP".



3 Click *Edit*.

4 Choose whether to use SNMP version 2 or version 3.



5 Configure the desired settings, then click *OK*.

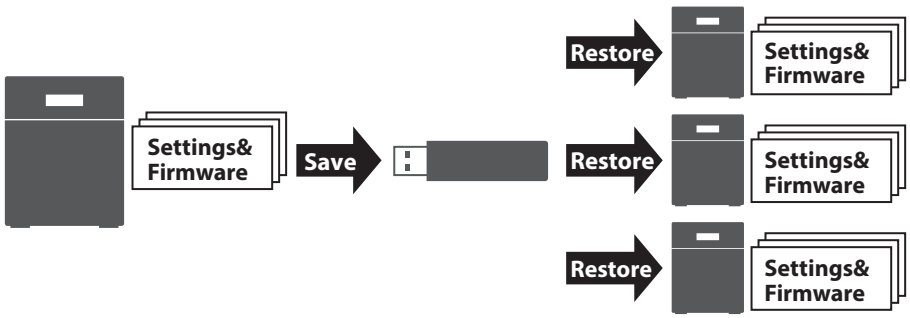
6 Move the SNMP switch to the  position to enable SNMP.

7 SNMP has been configured for the TeraStation. For further use, configure your SNMP-compatible network management software using the Buffalo-specific MIB (management information base) file. The MIB file is available from the Buffalo website.

Depending on which SNMP client software you use, the procedure for configuring the software will differ. For more detailed information on configuring the client software, refer to its help or included manual.

Saving and Applying Settings

The TeraStation's settings can be saved to a USB drive and restored to another TeraStation of the same series. Use this function to back up and copy settings to a new TeraStation.



Make a note of the hard drive configuration (number of hard drives, RAID, LVM, etc.) of the TeraStation whose the settings were saved. Make sure that any TeraStation that you apply these settings to has exactly the same hard drive configuration before you apply the settings. If the drive configuration is different, you may get unexpected results.

The following settings are not saved or restored:

Category	Settings
File Sharing	Shared folder information of the USB drive and media cartridge
Drives	All settings in "Drives"
	All settings in "LVM"
	All settings in "iSCSI"
	USB drive and media cartridge information
Web Services	Task settings of Dropbox Sync
Network	All settings except for service port restrictions, Wake-on-LAN, and Ethernet frame size settings in "IP Address"
	All settings in "Port Trunking"
Backup	All settings in "Failover"
Management	The TeraStation's hostname
	All settings in "UPS Sync"
	All settings in "SSL"
	Display language in Settings

Saving Settings

1 Insert a USB drive into a USB port on the TeraStation.

Notes:

- Use a USB 2.0 port. If your TeraStation has both USB 3.0 and USB 2.0 ports, make sure that you use one of the USB 2.0 ports.
- The USB drive should have a capacity of at least 1 GB.
- Any data stored on the USB drive will be deleted.

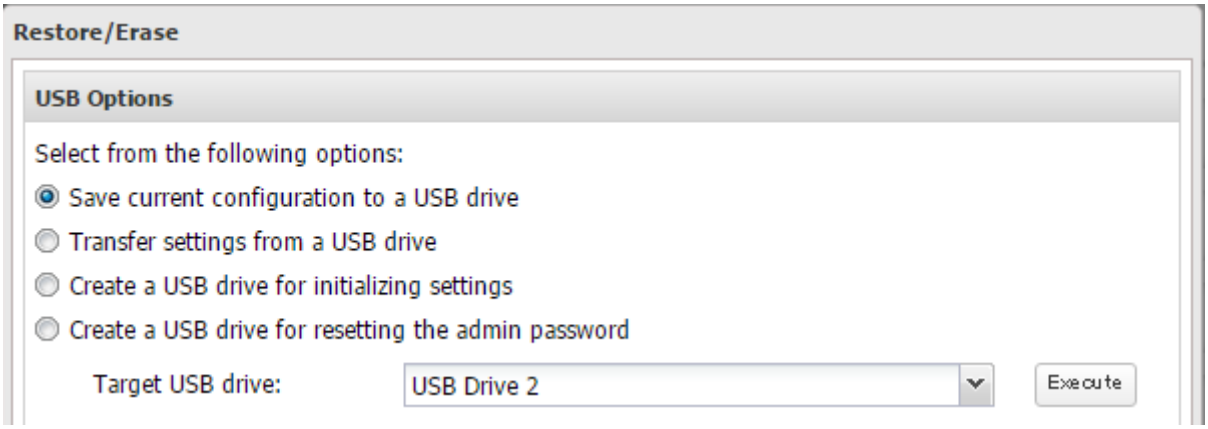
2 In Settings, click *Management*.



3 Click  to the right of "Restore/Erase".



4 From "Target USB drive", select the USB drive that is connected to the USB 2.0 port on the TeraStation.



5 Select "Save current configuration to a USB drive", then click *Execute*.

6 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*. The TeraStation will save the settings.

7 When the "finished" message is displayed, saving settings is finished. Click *OK*.

Troubleshooting:

If the settings are not saved to the USB drive successfully, you may receive the error message "The specified operation cannot be executed.". Verify:

- The USB drive is connected to a USB 2.0 port, not a USB 3.0 port.
- The USB drive has a capacity of 1 GB or larger.
- The USB drive is not write-protected.

Applying Settings

The saved settings can be applied to a different TeraStation of the same series. If applying settings to another TeraStation, the unit's current firmware version will be changed to the version used to save the settings.

1 Connect the USB drive with the saved settings to a USB 2.0 port on the TeraStation (not a USB 3.0 port).

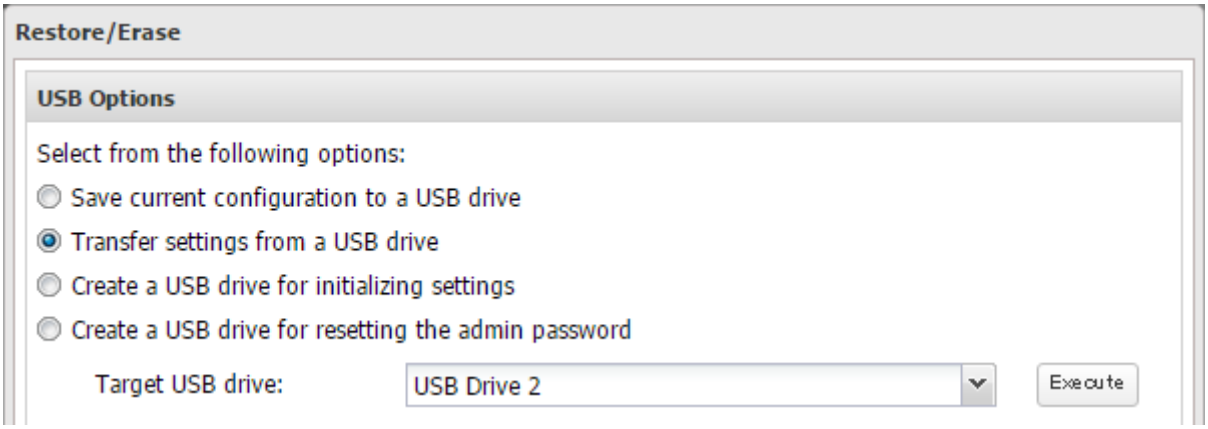
2 In Settings, click *Management*.



3 Click  to the right of "Restore/Erase".



4 From "Target USB drive", select the USB drive that is connected to the USB 2.0 port on the TeraStation.



5 Select "Transfer settings from a USB drive", then click *Execute*.

6 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*. The TeraStation will apply the settings.

7 When the "finished" message is displayed, applying settings is finished. Click *OK*.

Restoring Factory Defaults

Initializing from Settings

To initialize the TeraStation to its factory defaults from Settings, follow this procedure.

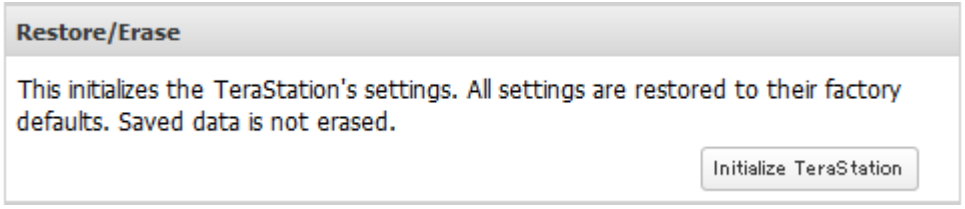
1 In Settings, click *Management*.



2 Click  to the right of "Restore/Erase".



3 Click *Initialize TeraStation*.



4 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*. The TeraStation will be restored to its factory default settings.

5 When the "finished" message is displayed, restoring settings is finished. Click *OK*.

Creating an Initialization Drive

A system initialization drive will restore the settings on your TeraStation to their factory defaults. You can initialize them without logging in to Settings. Follow the procedure below to create a system initialization drive.

Notes:

- Normally, making and using the system initialization drive will not affect data on the TeraStation. However, always back up your data regularly!
- This USB drive can be used to recover the system if your TeraStation doesn't boot at all. In this case, if the data partition is damaged, then all your data will be deleted by the recovery process.

1 Insert a 1 GB or larger USB flash drive (not included) into a USB 2.0 port on the TeraStation.

2 In Settings, navigate to *Management - Restore/Erase - USB Options*.

3 Select "Create a USB drive for initializing settings".

Note: All data on the USB flash drive will be erased!

4 Select the USB drive from "Target USB drive", then click *Execute*.

5 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*. The TeraStation will create the initialization drive. This will take about a minute.

6 When the "finished" dialog opens, the USB initialization drive is ready to use. Dismount the USB drive before unplugging it. See the "Dismounting Drives" section in chapter 4 for the procedure on dismounting drives.

Initializing with the USB Drive

To initialize the settings on your TeraStation with the USB drive as created above, follow the procedure below.

Note: If using the initialization drive to initialize, the unit's current firmware version will be changed to the version used to create the initialization drive.

1 Create a USB "initialization drive" as described above.

2 Insert the USB drive into a USB 2.0 port (not a USB 3.0 port) on the TeraStation. Make sure that no other USB drives are connected to any USB ports on the TeraStation.

3 Set the boot mode switch to "USB".

4 Press the power button to turn on the TeraStation.

5 When the I41 message appears on the LCD panel, press the function button.

6 It will take several minutes for initializing the settings. The TeraStation will shut down when it's finished.

7 After shutdown, the I39 message is displayed.

8 Set the boot mode switch to "HDD" position.

9 Press the power button to start the TeraStation.

Resetting the Administrator Password

Creating a Password Reset Drive

A password initialization drive can reset the administrator password to its default value ("password"). This could be very useful if you forget your admin password.

1. Connect a 1 GB or larger USB drive (not included) to a USB 2.0 port on the TeraStation.
2. In Settings, navigate to *Management - Restore/Erase - USB Options*.
3. Select *Create a USB drive for resetting the admin password*.

   Note: All data on the USB flash drive will be erased!
4. Select the USB drive from "Target USB drive" list, then click *Execute*.
5. The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*. The TeraStation will create the password reset drive. This will take about a minute.
6. When the "finished" dialog opens, the password reset drive is ready to use. Dismount the USB drive before unplugging it. See the "Dismounting Drives" section in chapter 4 for the procedure on dismounting drives.

Resetting with the USB Drive

To reset your admin password, follow the procedure below.

1. Create a USB "password initialization" drive as described above.
2. Insert the USB drive into a USB 2.0 port (not a USB 3.0 port) on the TeraStation.
3. Set the boot mode switch to "USB".
4. Press the power button to turn on the TeraStation.
5. When the I41 message appears on the LCD panel, press the function button.
6. The password will be reset to its factory default. The TeraStation will shut down when it's finished.
7. After shutdown, the I39 message is displayed.
8. Set the boot mode switch to "HDD" position.
9. Press the power button to start the TeraStation.

Logs

Follow the procedure to check the TeraStation's logs.

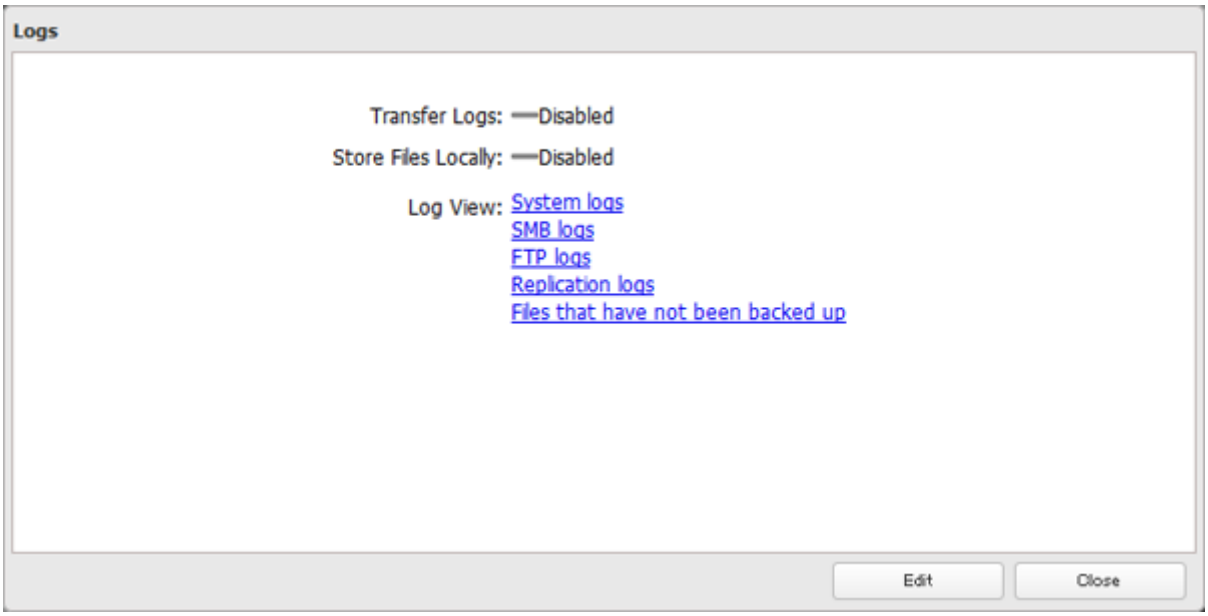
1. In Settings, click *Management*.



2 Click  to the right of "Logs".



3 Select a log to view.



The file operation log stores file operations performed on the internal hard drives. File operations on USB drives are not logged.

Note: All logs are encoded in UTF-8 format. To show them correctly, change the software encoding to "UTF-8".

Transferring Logs to the Syslog Server

1 In Settings, click *Management*.



2 Click  to the right of "Logs".



3 Click *Edit*.

4 Enable "Syslog Transfer".

5 Enter the IP address of the syslog server where you want to transfer the logs to.

6 Select the type of log that you want to transfer from "Logs to Transfer".

7 Click *OK*.

Note: FTP logs cannot be written to a syslog server.

Creating a Link to the Logs in the Shared Folder

1 In Settings, click *Management*.

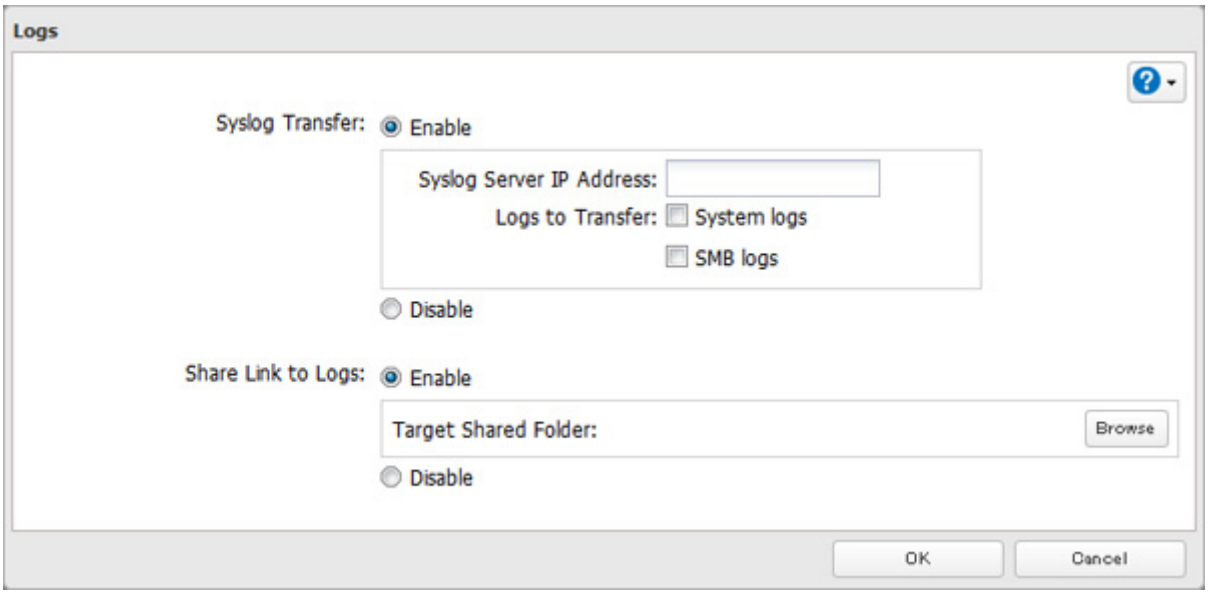


2 Click  to the right of "Logs".



3 Click *Edit*.

4 Enable "Share Link to Logs".



5 Click *Browse* and select the shared folder where the link will be created in "Target Shared Folder". Click *OK*.

6 Click *OK*.

Under the selected shared folder, a folder named "system_log" will now contain the logs.

Updating the Firmware

If a new firmware is available, a message is displayed when the TeraStation boots. You can update the firmware either manually or automatically.

Notes:

- Updating version 2.40 or earlier firmware to 2.60 will overwrite your current guest account and user accounts email address settings. The guest account will be enabled and all user accounts' email addresses will be blank. Reconfigure your desired guest and user account settings after this update.
- If all drives and RAID arrays on the TeraStation have LVM enabled but no LVM volumes have been created, you will not able to update the firmware from Settings.
- Settings is not available while the firmware is updating. Don't try to access Settings from another computer until the update is complete.

Updating Manually

1 In Settings, click *Management*.



2 Click  to the right of "Update".



3 Click *Install Update*.

You can also download the latest firmware from the Buffalo website.

Updating Automatically

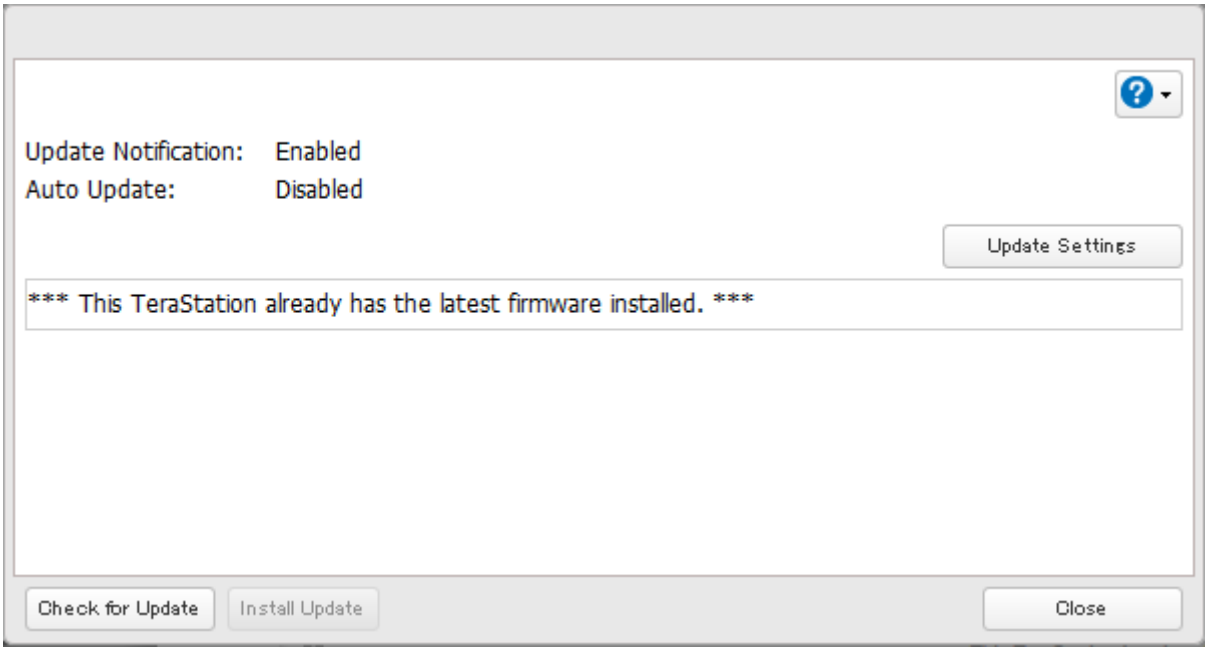
1 In Settings, click *Management*.



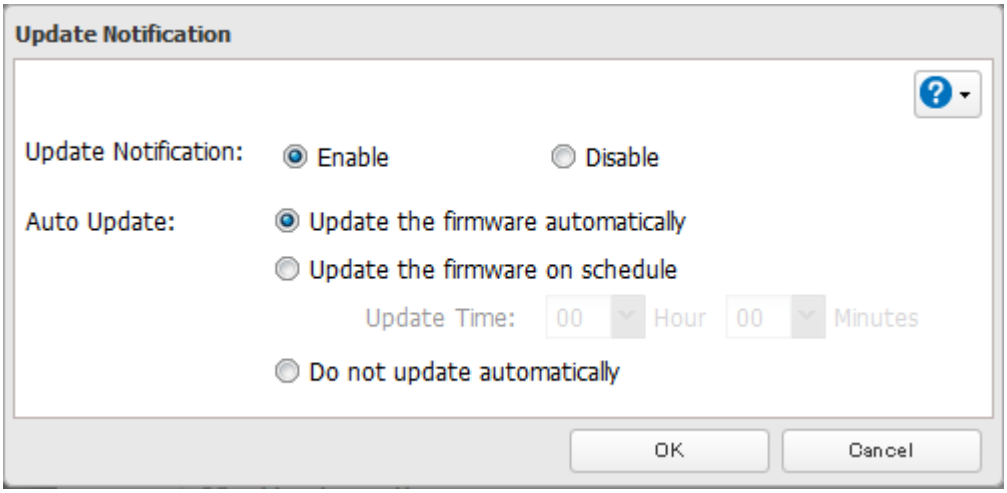
2 Click  to the right of "Update".



3 Click *Update Settings*.



4 Select "Update the firmware automatically" and click *OK*.



Alternately, you may choose to schedule updates for a specific time of day.

Name, Date, Time, and Language

Configure the TeraStation's hostname, date, time, and language as shown below.

Note: If the TeraStation is being used as an iSCSI hard drive, to change the settings, navigate to *Drives - iSCSI* in Settings and move the iSCSI switch to the "off" position temporarily before changing settings.

1 In Settings, click *Management*.

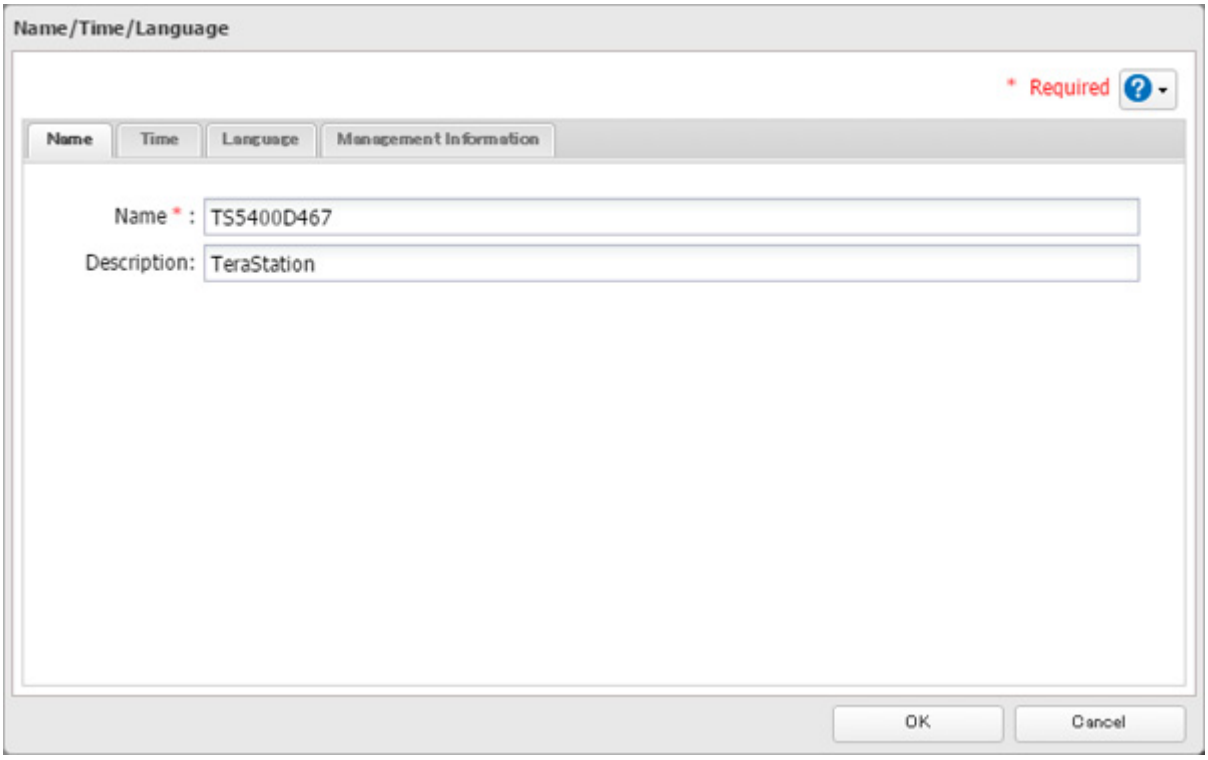


2 Click  to the right of "Name/Time/Language".



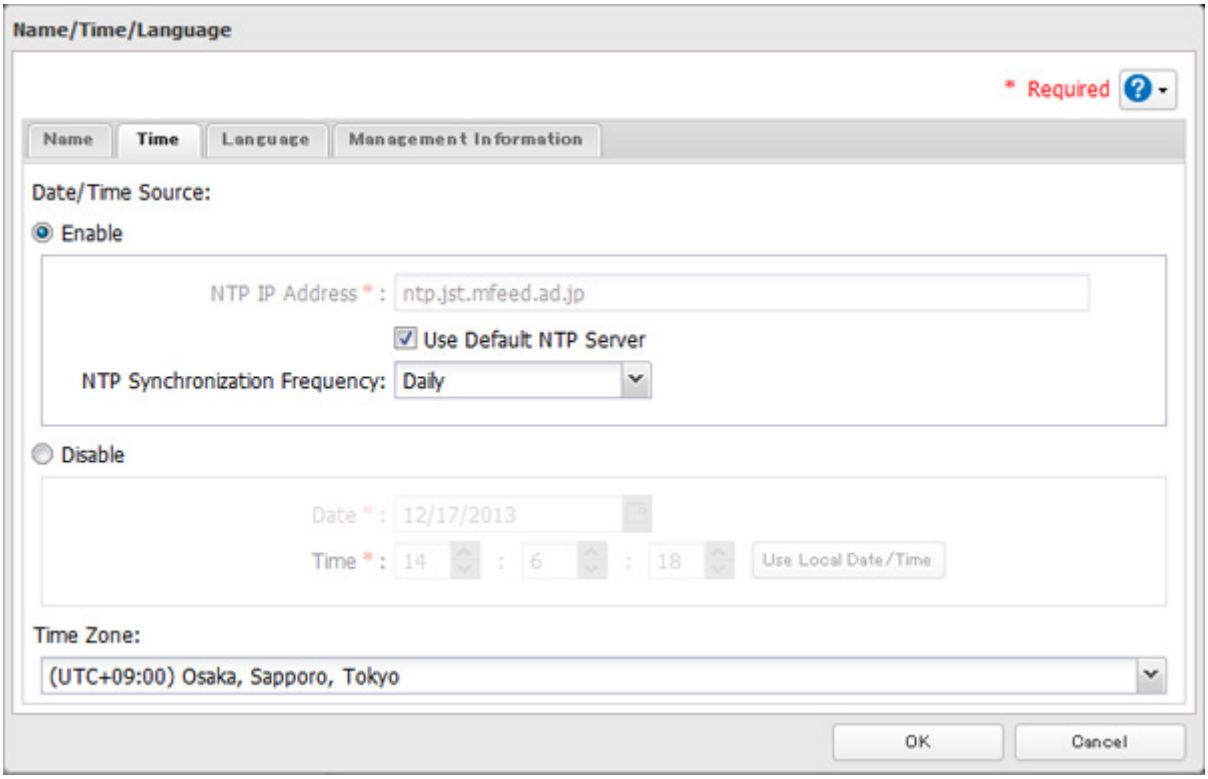
3 Click *Edit*.

4 Click the *Name* tab, then configure the TeraStation's name and description.



5 Click the *Time* tab. Enable the NTP server and select the "Use Default NTP Server" checkbox.

Click *Use Local Date/Time* to use your computer's time settings for the TeraStation.



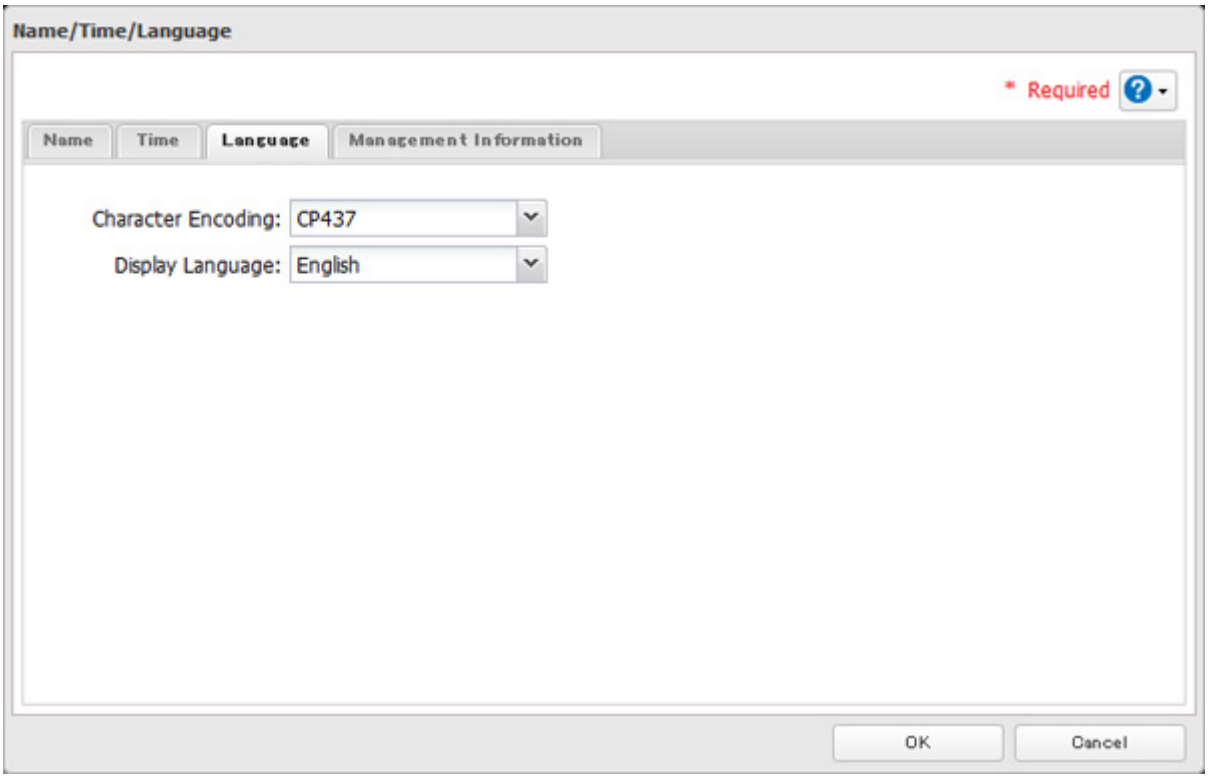
By default, the TeraStation adjusts its clock automatically by using a default NTP server. This NTP server belongs to Internet Multi Feed Inc. For more information, visit http://www.jst.mfeed.ad.jp.

To use a different NTP server, select *Name/Time/Language* from *Management*. Click *Time*, then *Edit*. Clear the "Use Default NTP Server" checkbox and enter a new NTP IP address. Click *OK*.

If an NTP server is specified by name instead of IP address, make sure that a DNS server is configured for the TeraStation.

Note: The internal clocks of the TeraStation and other devices on your network may run at slightly different speeds. Over a long period of time your network devices may show somewhat different times, which can cause network problems. If clocks on your network vary by more than 5 minutes it may cause unexpected behavior. For best results, keep all clocks on the network set to the same time by adjusting them regularly, or use an NTP server to correct them all automatically.

6 Click the *Language* tab. Select the language to be used and click *OK*.



Note: This tab changes the language used by the TeraStation for email notifications, antivirus software, DLNA, and other functions. To change the language displayed in Settings, go to Advanced Settings or Easy Admin and click *Language* from the menu bar. Choose your desired language from the drop-down list.

Beep Alerts

You can set the TeraStation to beep if certain errors occur.

1 In Settings, click *Management*.

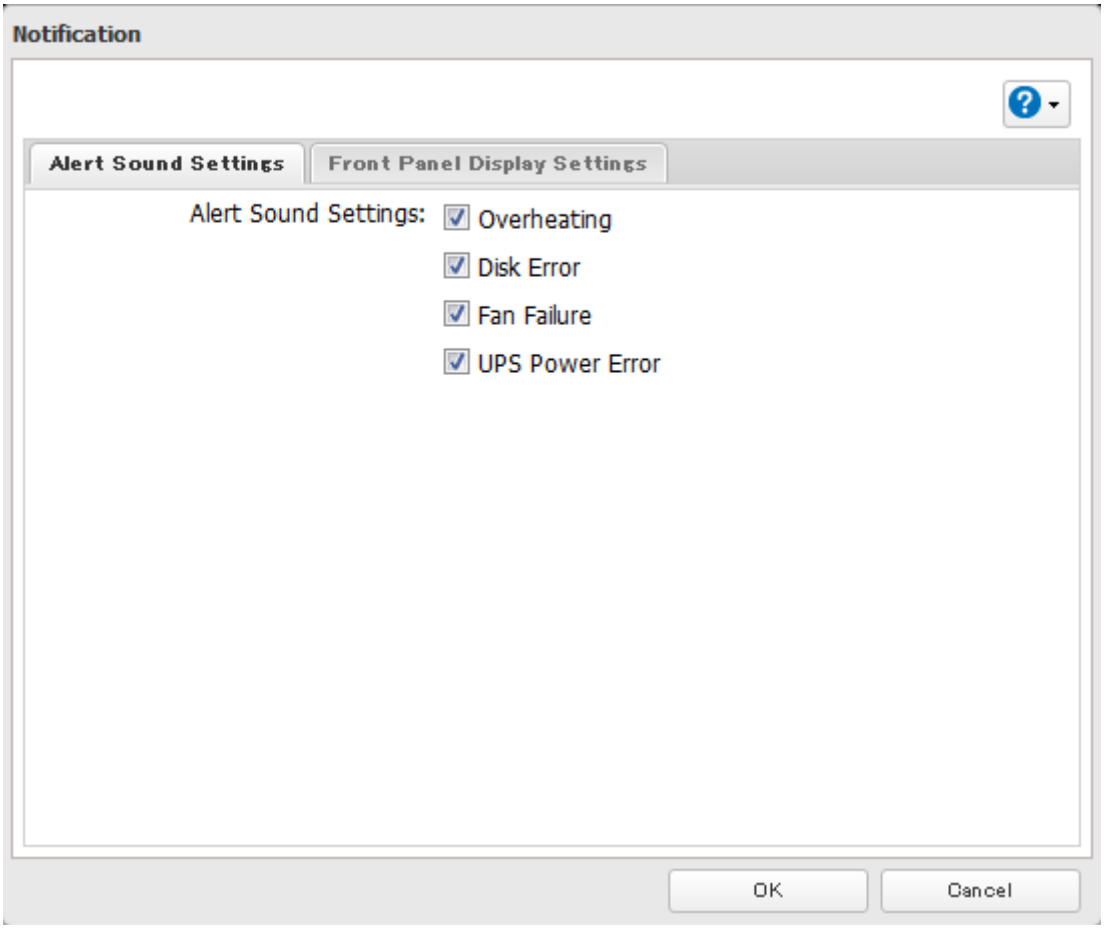


2 Click  to the right of "Notifications".



3 Click *Edit*.

4 Select the triggers to make the alert beep, then click *OK*.



LCD and LEDs

You may configure the LEDs and LCD on the TeraStation.

1 In Settings, click *Management*.



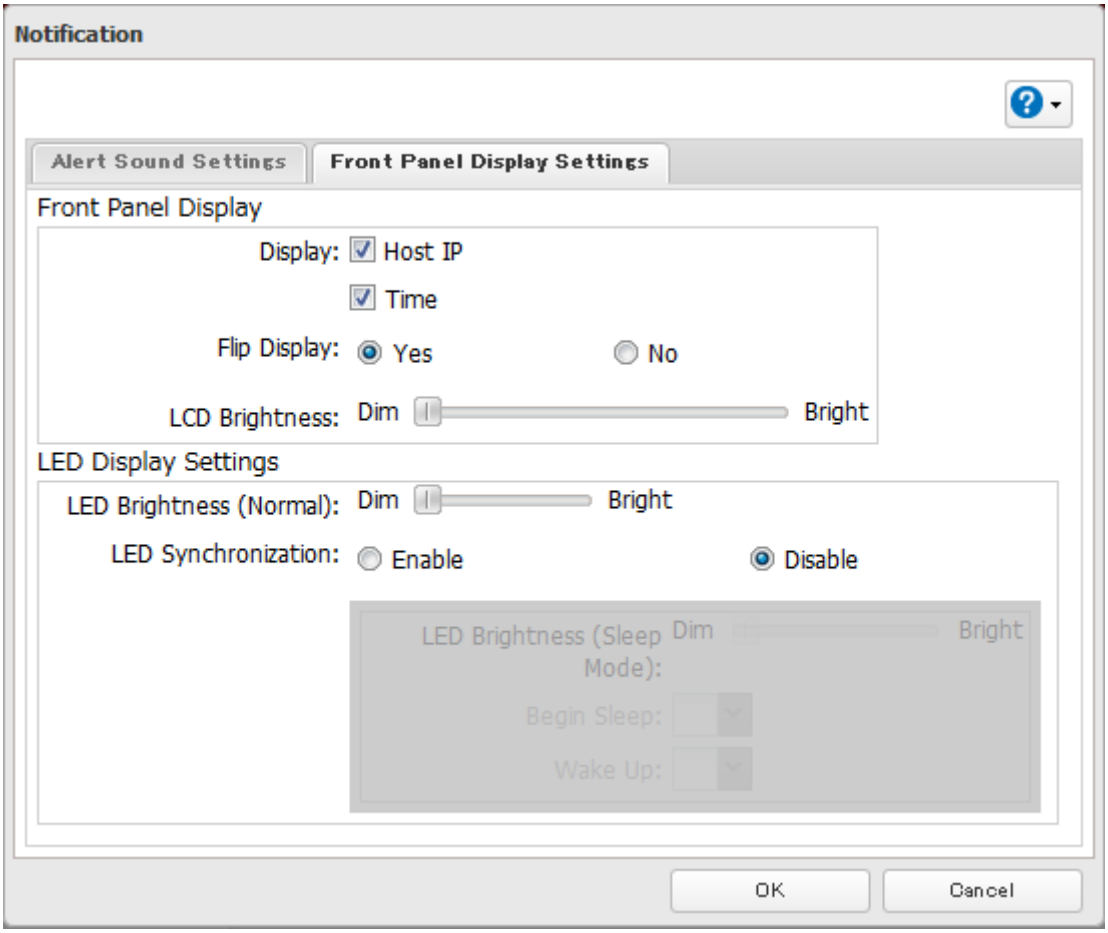
2 Click  to the right of "Notifications".



3 Click *Edit*.

4 Click *Front Panel Display Settings*.

5 Configure your settings, then click *OK*.



Jumbo Frames

If your other network devices support jumbo frames, you may be able to increase network performance.

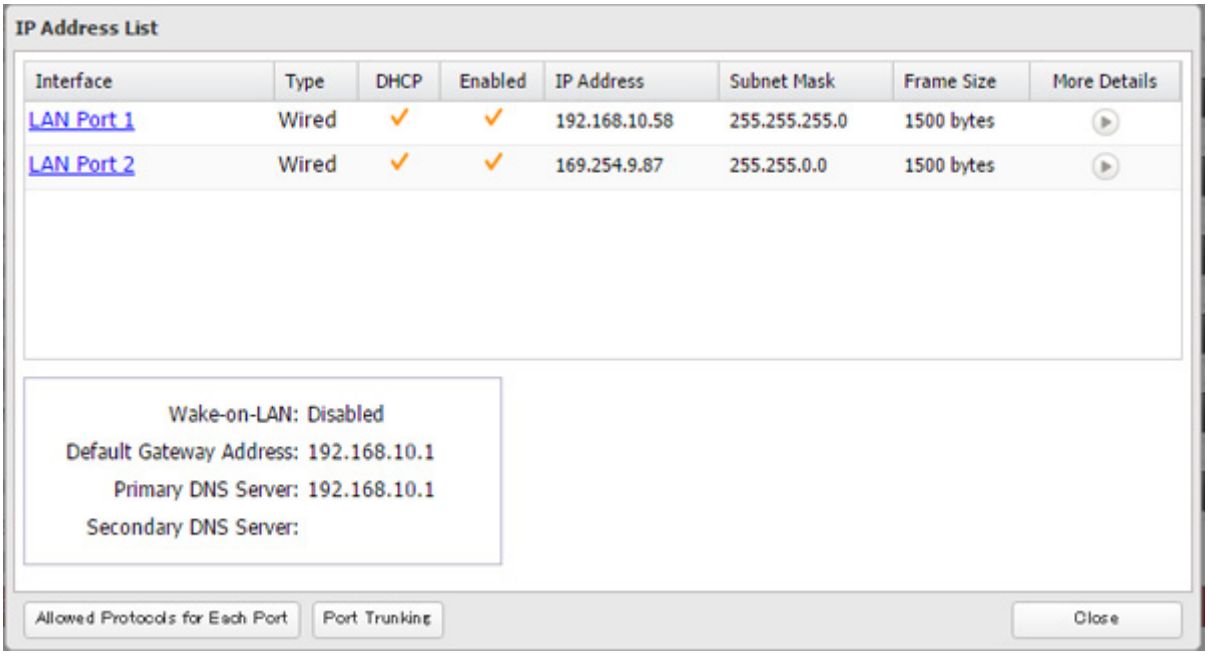
1 In Settings, click *Network*.



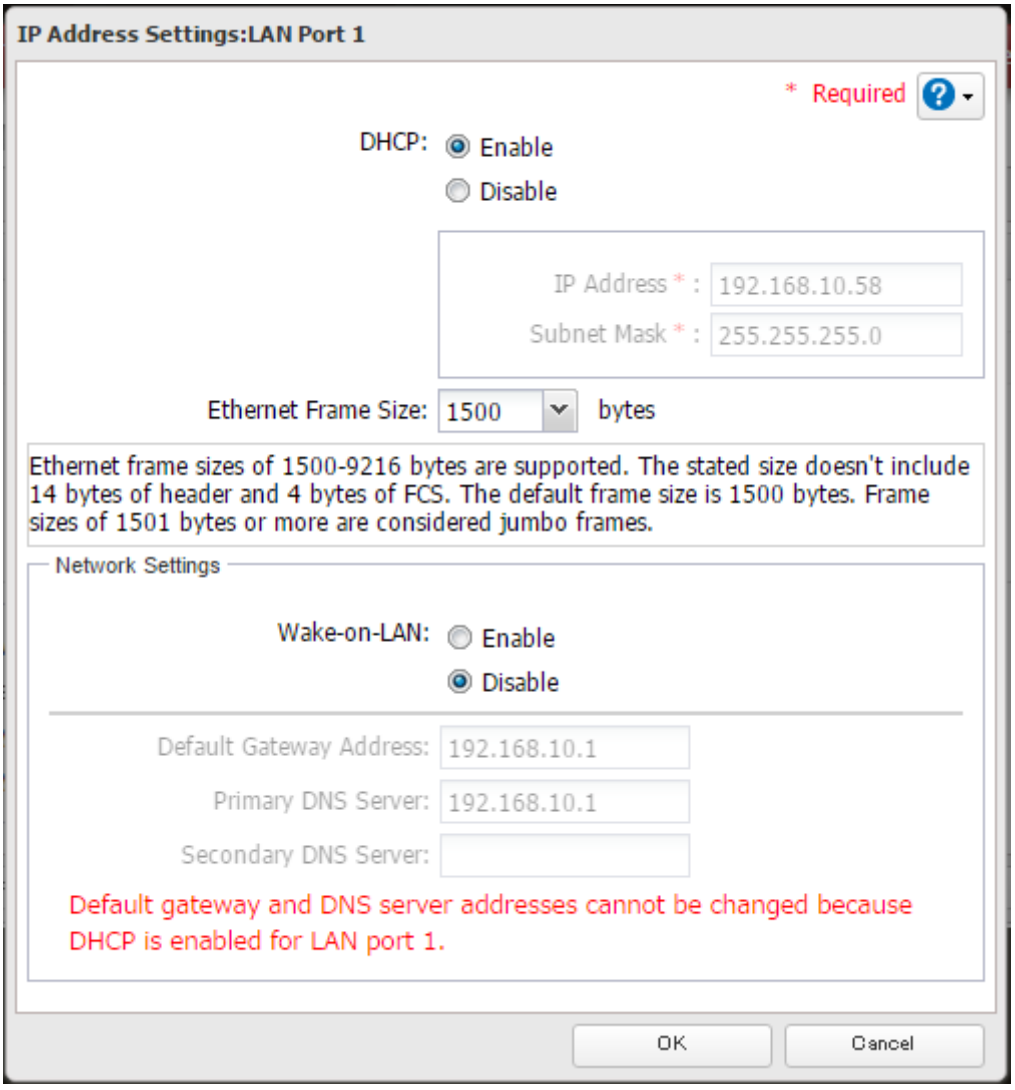
2 Click  to the right of "IP Address".

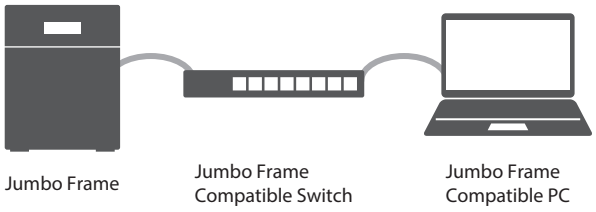
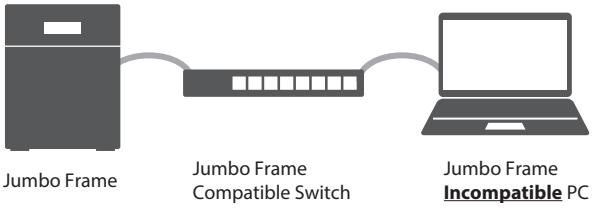
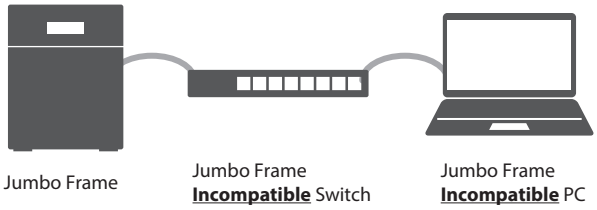
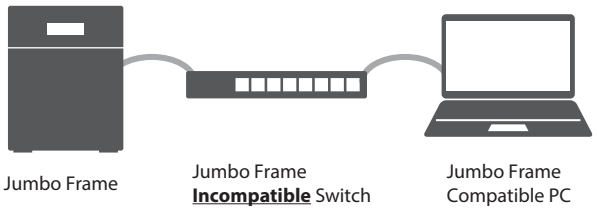


3 Click the LAN port where the jumbo frames will be used.



4 Select the desired Ethernet frame size and click *OK*.



Connection	Transmission	
	○	Transfer data in jumbo frames.
	△	Transfer data not using jumbo frames.
	△	Transfer data not using jumbo frames.
	×	Any data cannot be transferred.

Note: Make sure the TeraStation's Ethernet frame size is smaller than the hub or router's. Larger frame sizes may not transfer the data to the TeraStation correctly.

Changing the IP Address

Normally, the TeraStation's IP address is set automatically from a DHCP server on your network. If you prefer, you can set it manually. An easy way to do this is to change it from NAS Navigator2 running on a computer connected to the same router (subnet) as the TeraStation. The procedure to change the IP address in Settings is below.

Note: If the TeraStation is being used as an iSCSI hard drive, to change the settings, navigate to *Drives - iSCSI* in Settings and move the iSCSI switch to the "off" position temporarily before changing network settings.

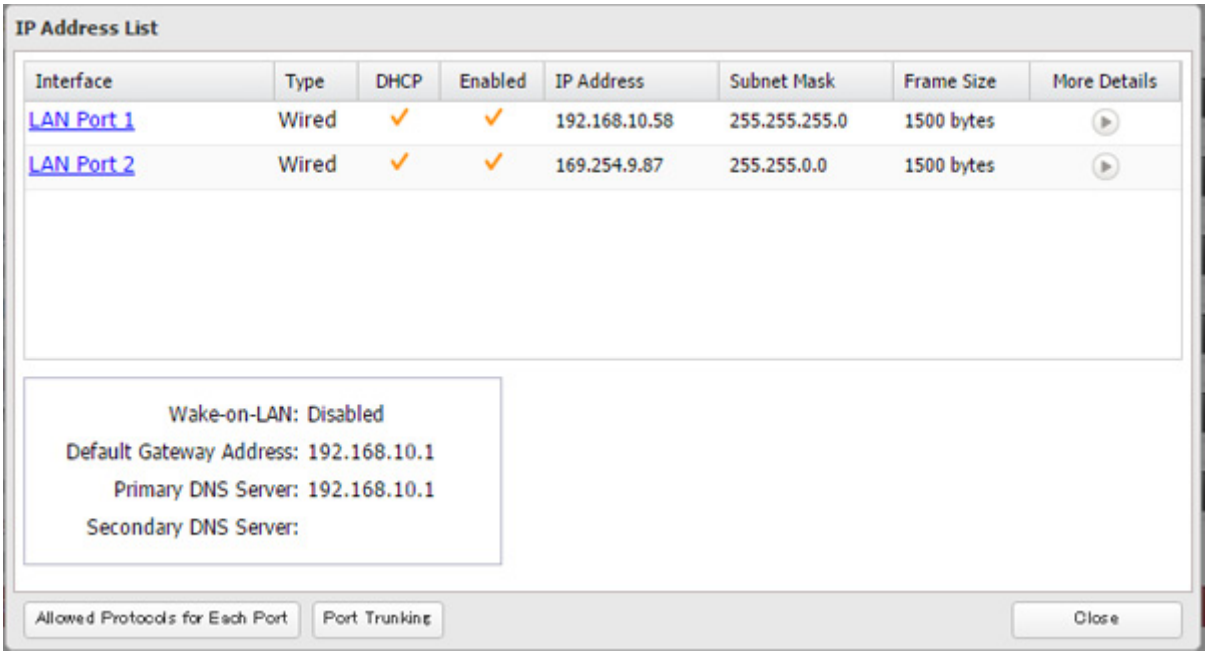
1 In Settings, click *Network*.



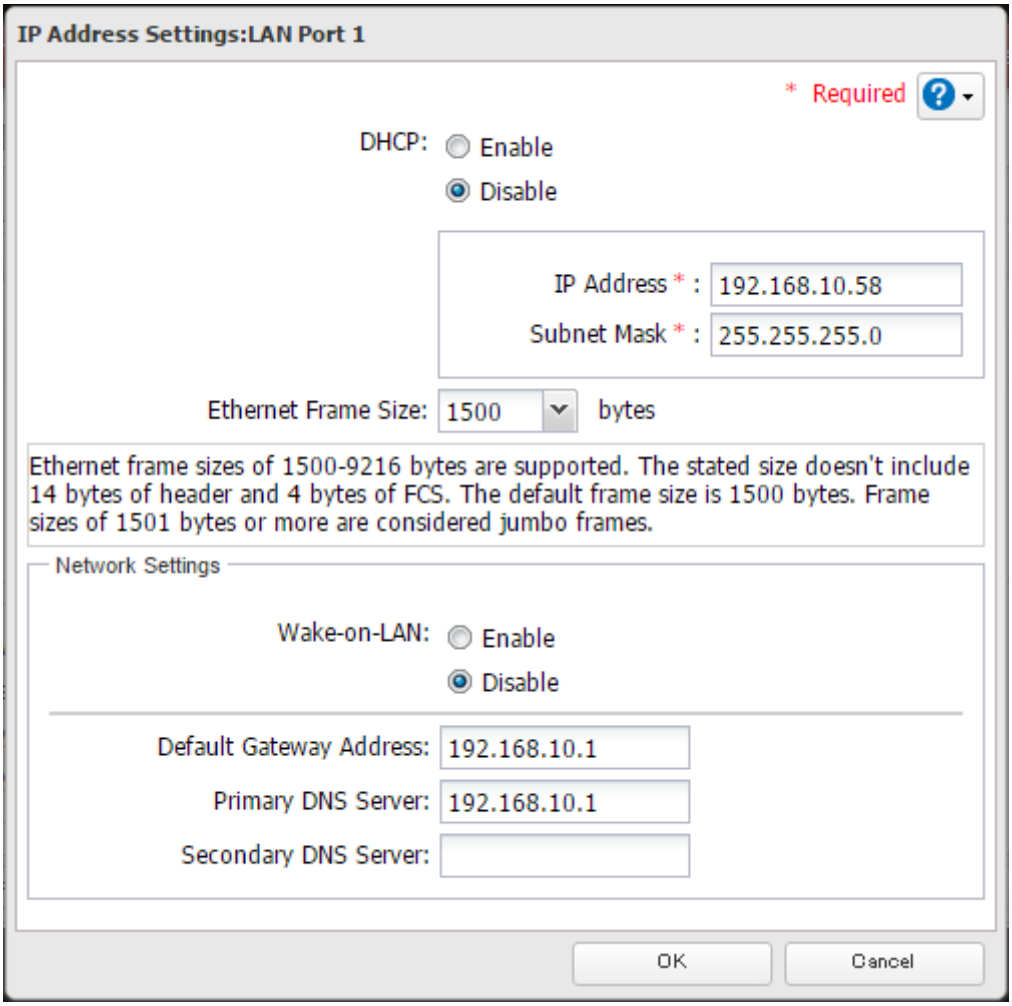
2 Click  to the right of "IP Address".



3 Click the LAN port where the IP address will be changed.



4 Disable "DHCP" and enter the desired IP address and subnet mask.



5 Under "Network Settings", enter the default gateway and DNS server addresses. If no changes are necessaries, keep them as is.

6 Click *OK*.

Notes:

- The default gateway in the "Network Settings" field will only affect LAN port 1; the DNS server addresses will affect both LAN ports 1 and 2. If you change the DNS server address on either IP address settings page, it will affect the other LAN port as well.
- Do not set the IP address of the same segment for LAN port 1 and LAN port 2. This may cause unstable network communication.
- The following IP addresses are reserved and should not be used. If you configure one of them by accident, initialize all settings by referring to the "Restoring Factory Defaults" section in chapter 10.
  Local loopback address: 127.0.0.1, 255.255.255.0
  Network address: 0.0.0.0, 255.255.255.0
  Broadcast address: 255.255.255.255, 255.255.255.0
  The IP address range from 224.0.0.0 to 255.255.255.255

Boot Authentication

Boot authentication allows you to authenticate the TeraStation while it's booting, and also prevent the TeraStation from being used in an unauthorized or unexpected manner, such as in cases of theft.
If authentication fails, the TeraStation will remain on, but all functions and services are stopped. Users will not be able to log in to Settings to make changes or access any shares.

Note Before Use

- To use boot authentication, a Windows PC is necessary to serve as the authentication server.
- When activating boot authentication, the hard drives on the TeraStation will be formatted and all data on the drives will be erased. Back up any important data to another device. Even though the data is deleted, the RAID array will be kept as is.
- Assigning the TeraStation a fixed IP address is recommended for boot authentication.
- When boot authentication settings finish, export the configuration file for backup. Refer to the "Exporting Managed TeraStations to a File" section in the Boot Authentication Tool help for the procedure.
- Boot authentication cannot be enabled if any of the following functions is enabled: drive encryption, LVM, iSCSI, and failover. Conversely, these functions cannot be enabled while boot authentication is enabled.

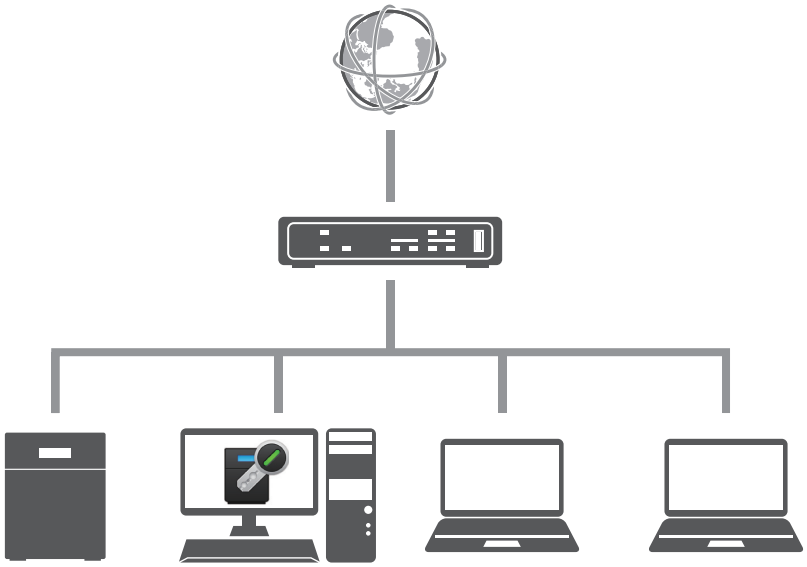
Important Notice

This feature was developed with the intention of preventing critical data leakage by rendering the TeraStation unusable in cases of misoperation or missing important setting files. Before configuring boot authentication, back up the data on the TeraStation by referring to the "Backup" section in chapter 5 and create a system initialization drive by referring to the "Creating an Initialization Drive" section above. With these preparations, a TeraStation that is unusable may be initialized and reverted to a usable state.
If any of the situations below occur, the TeraStation will stop booting and become inaccessible.

- The TeraStation is unable to communicate with the authentication server due to the server crashing or it being on another network.
- The TeraStation unit has been deleted from Boot Authentication Tool or the Boot Authentication Tool database has been erased.
- Security level is configured to "High" and the wrong passcode is entered 3 times.

Setting Up the Authentication Server on a Windows PC

To set up the authentication server, follow the procedure below. The authentication server must be on the local network or VPN.



Note: For proper operation, make sure that the TeraStation and the authentication server are on a network with only one router. If there are two or more routers on the network, the authentication server may not acquire the correct TeraStation status. For example, if the TeraStation's IP address has been changed, its status does not change to "Warning".

1 Download the application for the authentication server, "Boot Authentication Tool", from the Buffalo website and install it onto the Windows PC.

2 Register the specific port number that is used on the application as a firewall exception rule. Navigate to *Control Panel - System and Security - Windows Firewall* on the authentication server.

3 Click *Advanced settings*.

4 Right-click *Inbound Rules* and click *New Rule*.

5 Select "Port" and click *Next*.

6 Select "TCP", enter the port number that is used on the application to the right of "Specific local ports", and click *Next*. The default port number on the application is "7010". The port number can be confirmed in the "Options" tab of the application.

7 Click *Next* twice.

8 Enter a desired name for the setting and click *Finish* to complete.

Configuring Boot Authentication on the TeraStation

1 In Settings, click *Management*.

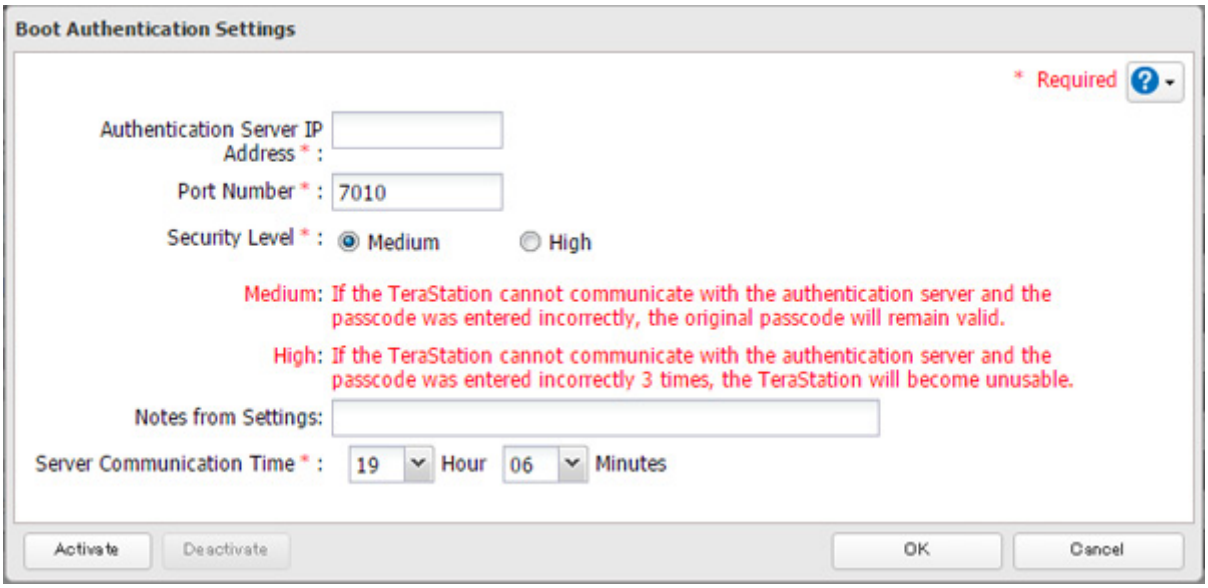


2 Click  to the right of "Boot Authentication".



3 Click *Edit*.

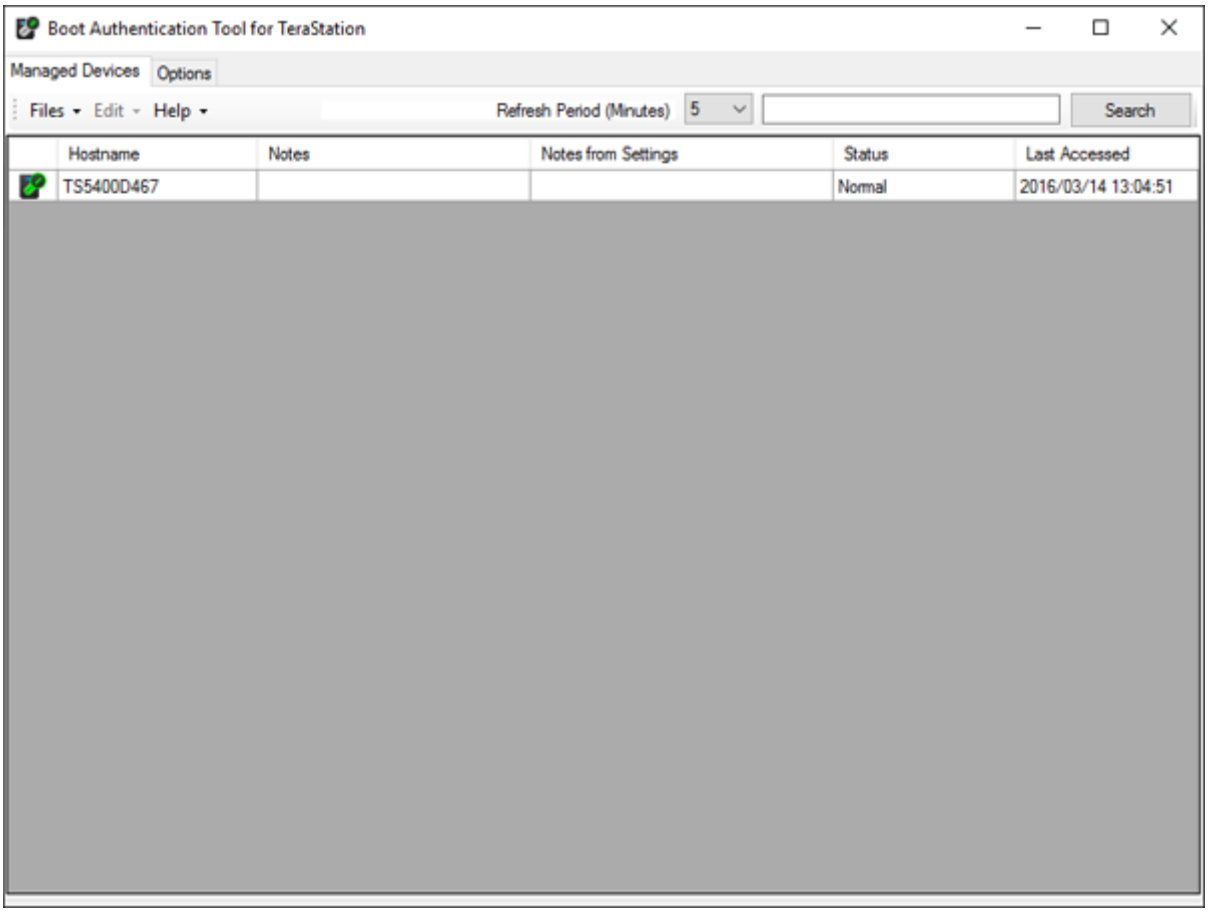
4 Enter the authentication server's IP address or hostname and port number, specify the security level and communication time settings, then click *Activate*.



5 The hard drive formatting process will start. Click *Yes*.

6 The "Confirm Operation" screen will open. Enter the confirmation number, then click *OK*.

7 The format will begin. Wait until it finishes. When the formatting finishes and the TeraStation is added to Boot Authentication Tool, boot authentication setting is completed.

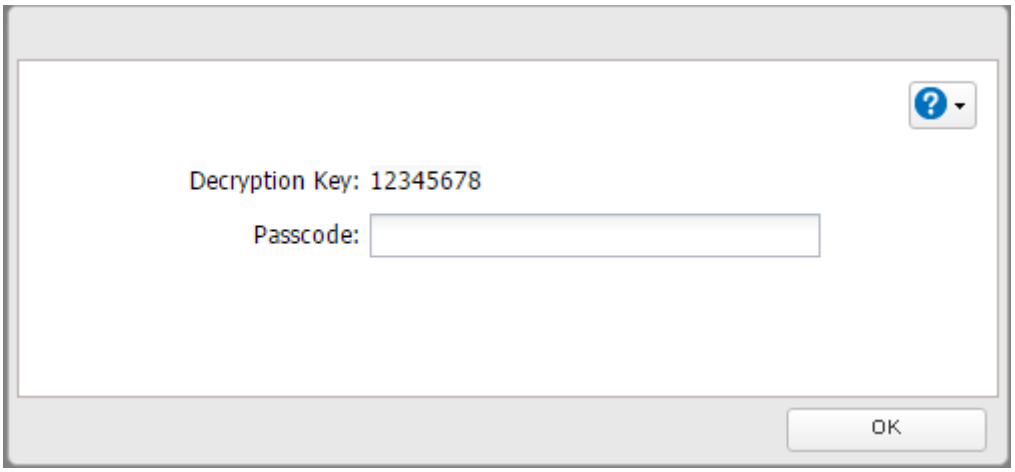


If the TeraStation Cannot Be Accessed

If the TeraStation cannot communicate with the authentication server or vice versa, such as in a case of network failure, the TeraStation will not be accessible. If the TeraStation is not accessible, manually authenticate the TeraStation by following the procedure below.

Note: The procedure defines an "authentication server administrator" as someone who manages the authentication server using Boot Authentication Tool, and a "user" as one attempting to access the TeraStation from a remote location.

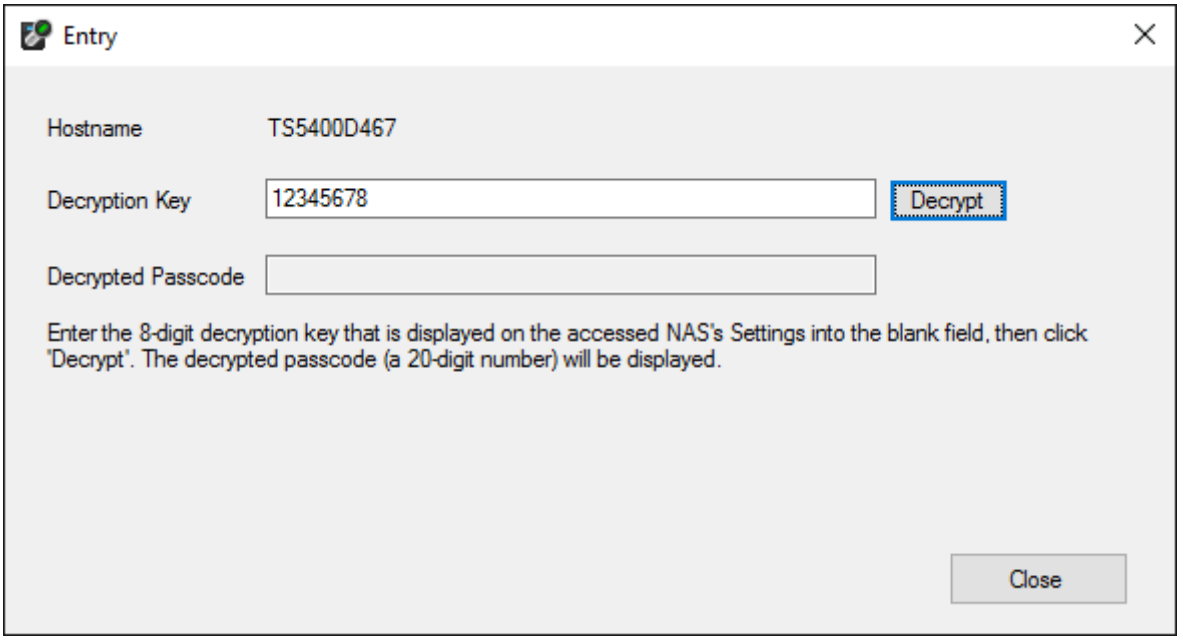
1 When the user tries to access the TeraStation's Settings and the TeraStation is not available, the screen below will be displayed. Have the user forward the decryption key to the authentication server administrator.



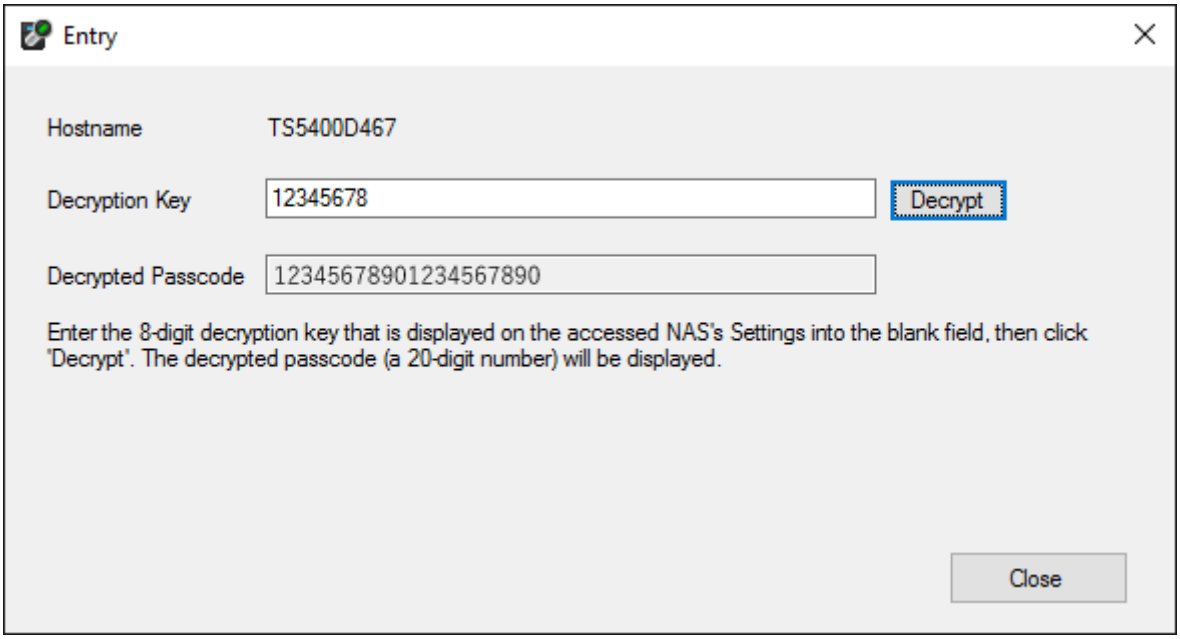
2 Open Boot Authentication Tool on the authentication server.

3 From Boot Authentication Tool, right-click on the target TeraStation from the list and click *Decrypt Passcode*.

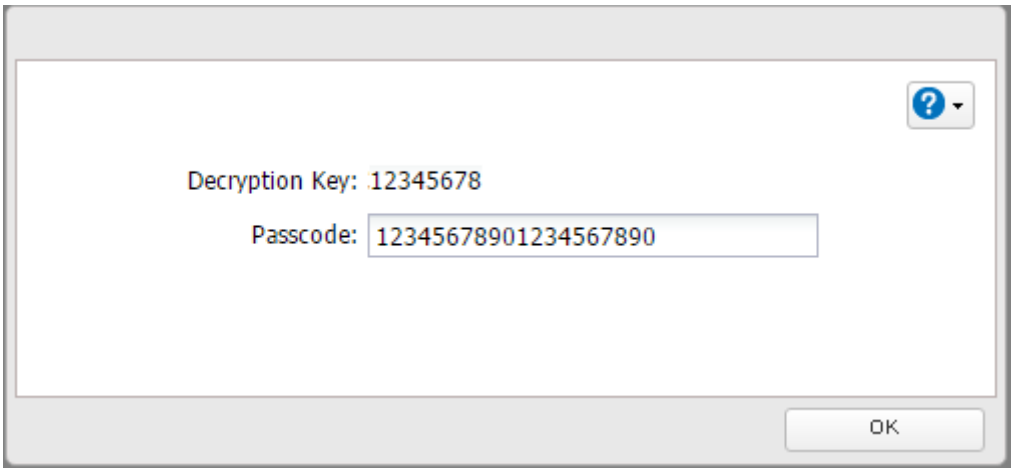
4 Enter the decryption key received from the user and click *Decrypt*.



5 The decrypted 20-digit passcode will be displayed. Send the passcode to the user.



6 The user can then enter the 20-digit passcode into Settings and click *OK*.



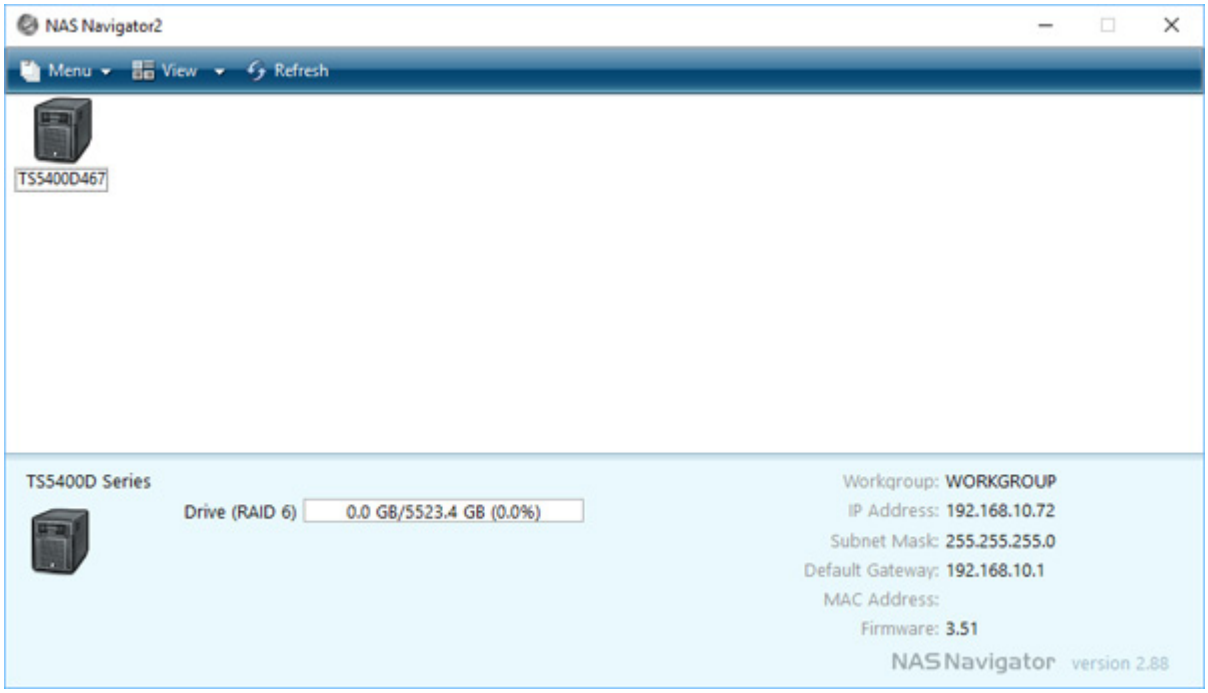
If the passcode is authenticated, the TeraStation will become available. The user can click *OK* to log in to Settings.

Chapter 11 Utilities

NAS Navigator2 for Windows

NAS Navigator2 is a utility program that makes it easy to display Settings, change the TeraStation's IP address, or check its hard drive. If you installed the TeraStation with the TeraNavigator CD, NAS Navigator2 was installed automatically.

Double-click the  icon to start NAS Navigator2.



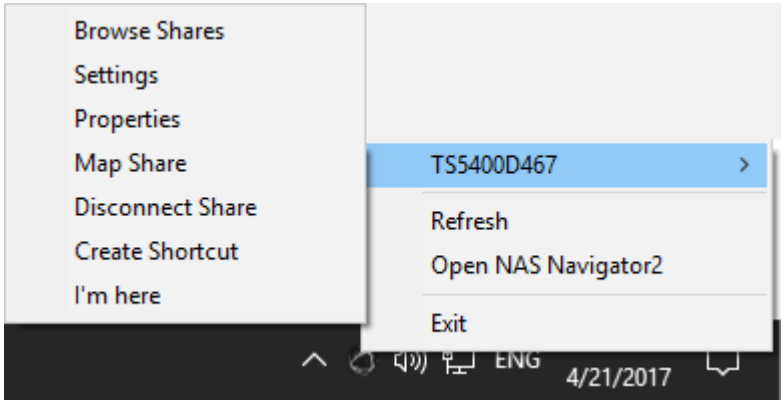
Click your TeraStation's icon to open a share on the TeraStation and display:

- Total capacity
- Capacity in use
- IP address
- Workgroup
- Subnet mask
- Default gateway
- MAC address
- Firmware version

Name		Description
Menu	Map Share*	Assigns the LinkStation's or TeraStation's shared folder as a network drive.
	Disconnect Share*	Unmaps the network drive.
	Map All Remote Shares to Drive Letters	Assigns all the LinkStations' or TeraStations' shared folders as network drives.
	Create Desktop Shortcut*	Creates a desktop shortcut to the selected LinkStation's or TeraStation's shared folders.
	Launch NAS Navigator2 on Startup	Launches NAS Navigator2 in the system tray when Windows boots.
	Display Errors	If an error occurs, an error message will pop up from the NAS Navigator2 icon in the system tray.
	Properties*	Opens the selected LinkStation's or TeraStation's properties page.
	Close	Closes NAS Navigator2.
View	View	Icons: Displays icons. Details: Displays the hostname, product name, workgroup, IP address, subnet mask, and default gateway.
	Sort by	If you have multiple LinkStations and TeraStations on the network, you may choose to display them in order of hostname, product name, workgroup, IP address, subnet mask, or default gateway.
Browse*		Opens the selected LinkStation's or TeraStation's shared folders.
Refresh		Searches for NAS devices on the network again.
I'm here*		Causes your TeraStation to beep.
Right-click your device's icon to show these options.	Browse Shares	Opens the selected LinkStation's or TeraStation's shared folders.
	Settings	Opens Settings for the selected LinkStation or TeraStation.
	Properties	Opens the selected LinkStation's or TeraStation's properties page.
	Map Share	Assigns the LinkStation's or TeraStation's shared folder as a network drive.
	Disconnect Share	Unmaps the network drive.
	Create Shortcut	Creates a desktop shortcut to the selected LinkStation's or TeraStation's shared folders.
	I'm here	Causes your TeraStation to beep.

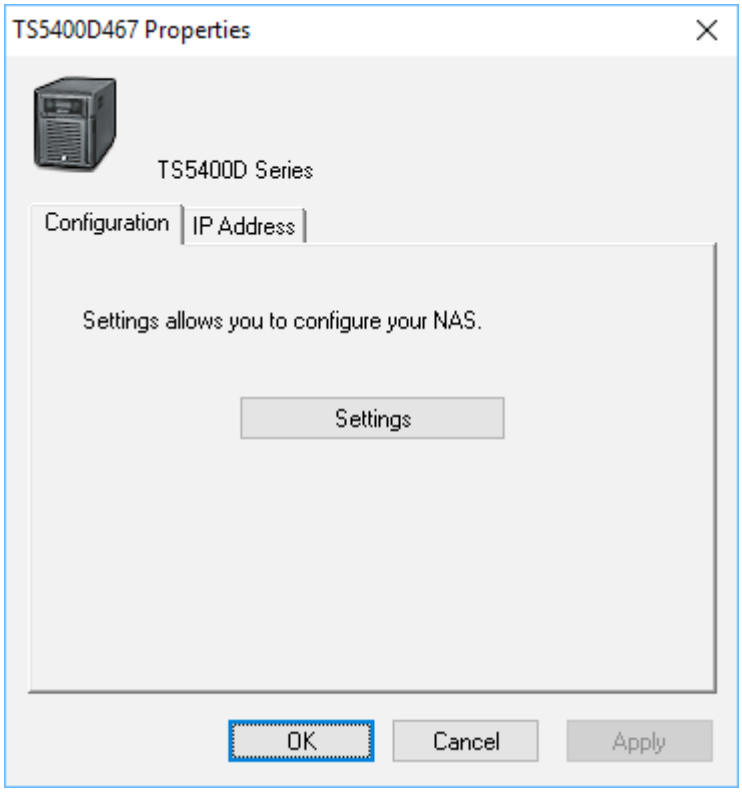
* Click on the LinkStation's or TeraStation's icon to display these options.

When NAS Navigator2 is closed, right-click on the NAS Navigator2 icon in the system tray for the following options.



Name		Description
LinkStation or TeraStation Name	Browse Shares	Opens the selected LinkStation's or TeraStation's shared folders.
	Settings	Opens Settings for the selected LinkStation or TeraStation.
	Properties	Opens the selected LinkStation's or TeraStation's properties page.
	Map Share	Assigns the LinkStation's or TeraStation's shared folder as a network drive.
	Disconnect Share	Unmaps the network drive.
	Create Shortcut	Creates a desktop shortcut to the selected LinkStation's or TeraStation's shared folders.
	I'm here	Causes your TeraStation to beep.
Refresh		Refreshes list of NAS devices.
Open NAS Navigator2		Opens the NAS Navigator2 window.
Exit		Exits NAS Navigator2.

The following tasks may be performed from the LinkStation's or TeraStation's properties page.



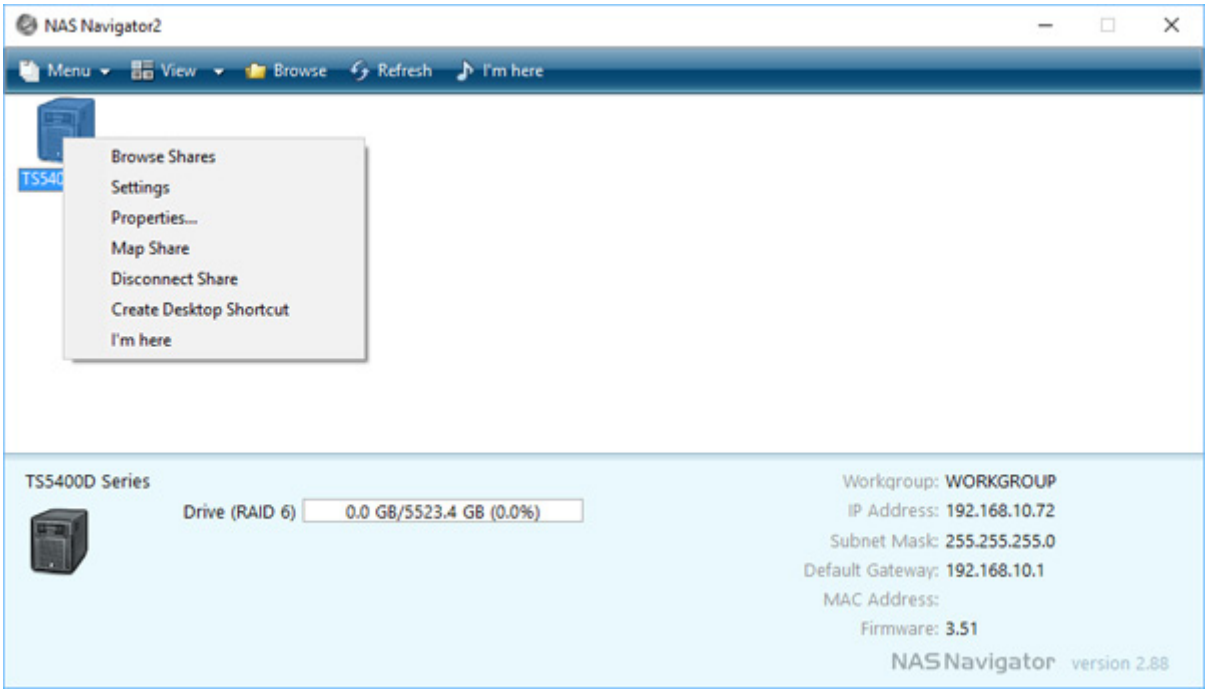
Name	Description
Configuration	Click *Settings* to open the configuration interface.
IP Address	Select the "Use DHCP" checkbox to assign an IP address from the DHCP server automatically. If there is no DHCP server on the network, you cannot use this function. Select the "Renew IP address" checkbox to obtain an IP address from the DHCP server. You can manually enter an IP address, subnet mask, and default gateway.

Mounting as a Network Drive

You can easily map a shared folder as a network drive using NAS Navigator2.

1 Double-click the icon to start NAS Navigator2.

2 Right-click on the TeraStation's icon, then click *Map Share*.



3 An icon for the mapped share will appear in Computer or My Computer. You can use this network drive just like any other hard drive.



Changing the IP Address

1 Double-click the icon to start NAS Navigator2.

2 Right-click on your TeraStation's icon and choose *Properties - IP Address*.

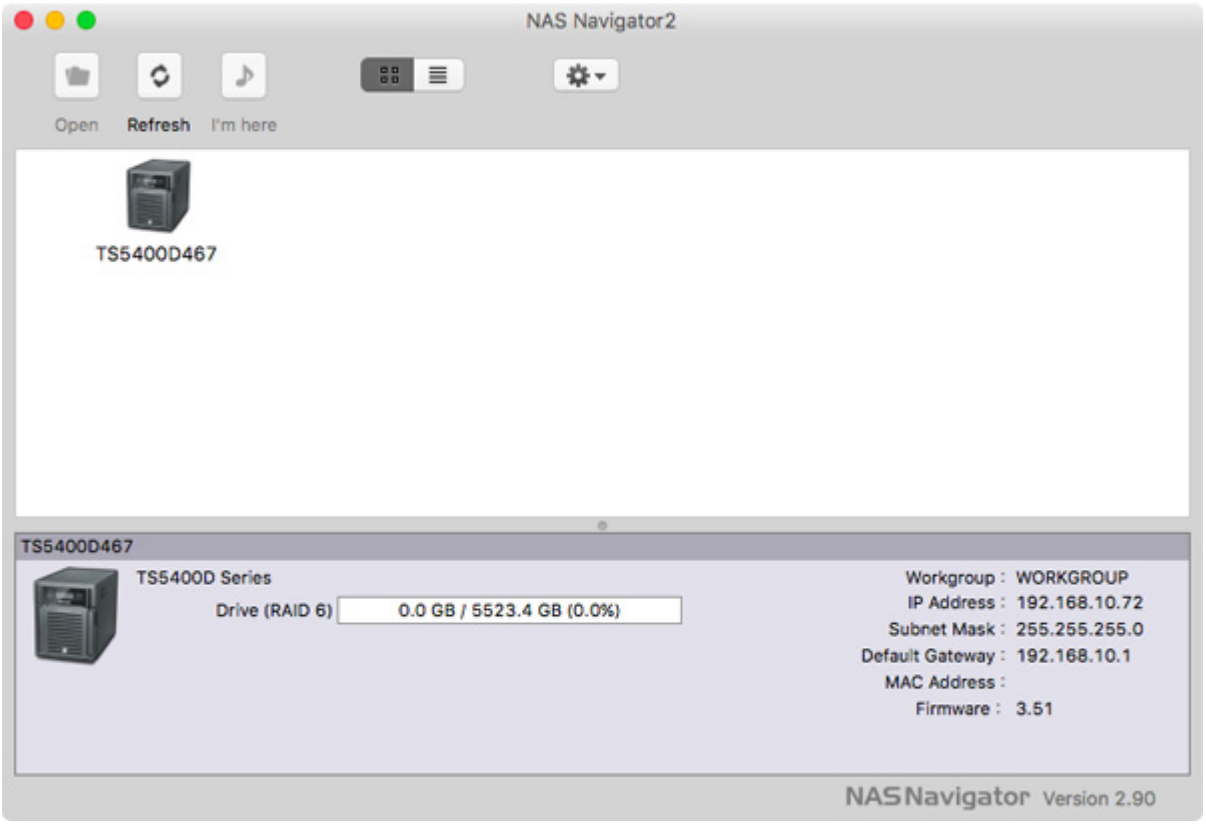
3 Clear the "Use DHCP" checkbox and enter the desired settings, then click *OK*. If the username and password prompt appears, enter the admin username and password.

Note: The following IP addresses are reserved and should not be used. If you configure one of them by accident, initialize all settings by referring to the "Restoring Factory Defaults" section in chapter 10.
Local loopback address: 127.0.0.1, 255.255.255.0
Network address: 0.0.0.0, 255.255.255.0
Broadcast address: 255.255.255.255, 255.255.255.0
The IP address range from 224.0.0.0 to 255.255.255.255

NAS Navigator2 for Mac

NAS Navigator2 is a utility program that makes it easy to display Settings, change the TeraStation's IP address, or check its hard drive.

If you installed the TeraStation with the TeraNavigator CD, NAS Navigator2 was installed automatically. To launch it, click the  icon in the Dock.



Click on a TeraStation's icon to display:

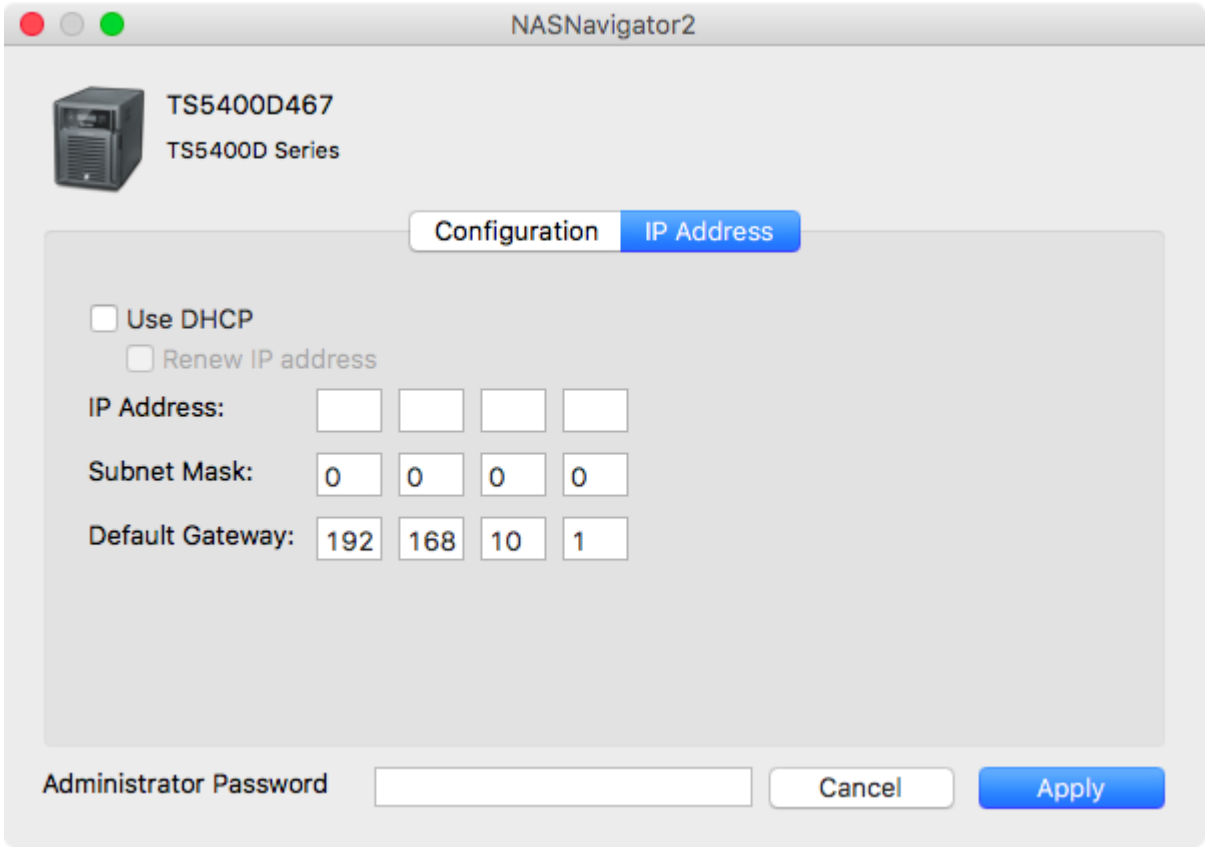
- Total capacity
- Used capacity
- Workgroup
- IP address
- Subnet mask
- Default gateway
- MAC address
- Firmware version

Double-click it to open a share on the TeraStation.

Name	Description
Open	Opens the default shared folder for a selected LinkStation or TeraStation.
Refresh	Searches for NAS devices on the network again.
I'm here	Causes your TeraStation to beep.
Settings	Opens Settings for the selected LinkStation or TeraStation.
Configure	Opens a window that lets you configure NAS's IP address or open Settings.
Label Color	Selects the color of the name displayed below the icon.
View Options	Lets you choose icon size, position, and view mode.

Name		Description
Auto Power Mode		Auto power mode can turn supported TeraStations and LinkStations on the network on and off automatically.
To display these options, hold down the control key and select your TeraStation's icon.	Open Folder	Opens the selected LinkStation's or TeraStation's shared folder.
	Settings	Opens Settings for the selected LinkStation or TeraStation.
	Configure	Opens a window that lets you configure the NAS's IP address or open Settings.
	I'm here	Causes your TeraStation to beep.
	Label Color	Selects the color of the name displayed below the icon.

The following tasks may be performed from the LinkStation's or TeraStation's properties page.



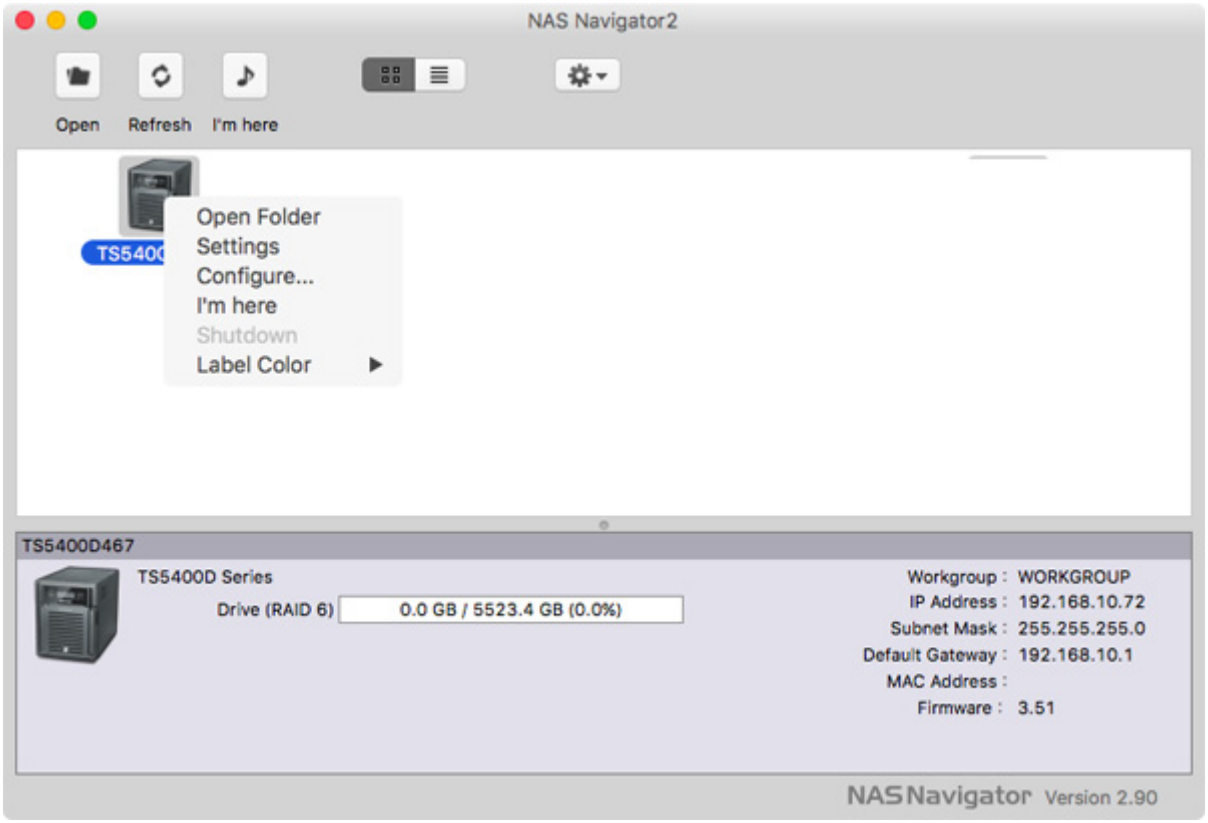
Name	Description
Configuration	Click *Settings* to open the configuration interface.
IP Address	Select the *Use DHCP* checkbox to assign an IP address from the DHCP server automatically. If there is no DHCP server on the network, you cannot use this function. Select the *Renew IP address* checkbox to obtain an IP address from the DHCP server. You can manually enter an IP address, subnet mask, and default gateway.

Mounting as a Network Drive

You can map a shared folder as a network drive using NAS Navigator2 on macOS.

1 Click the  icon in the Dock to start NAS Navigator2.

2 Double-click the TeraStation icon or click the TeraStation icon while holding down the control key, then select *Open Folder*. Enter a username and password with the rights to access the shared folder.



3 Select the shared folder that you want to mount, then click *OK*.

4 The shared folder is now mounted as a network drive.

Changing the IP Address

1 Click the  icon in the Dock to start NAS Navigator2.

2 Click the TeraStation icon while holding down the control key, then choose *Configure - IP Address*.

3 Clear the "Use DHCP" checkbox; enter the desired settings and the administrator password, then click *Apply*.

Note: The following IP addresses are reserved and should not be used. If you configure one of them by accident, initialize all settings by referring to the "Restoring Factory Defaults" section in chapter 10.
Local loopback address: 127.0.0.1, 255.255.255.0
Network address: 0.0.0.0, 255.255.255.0
Broadcast address: 255.255.255.255, 255.255.255.0
The IP address range from 224.0.0.0 to 255.255.255.255

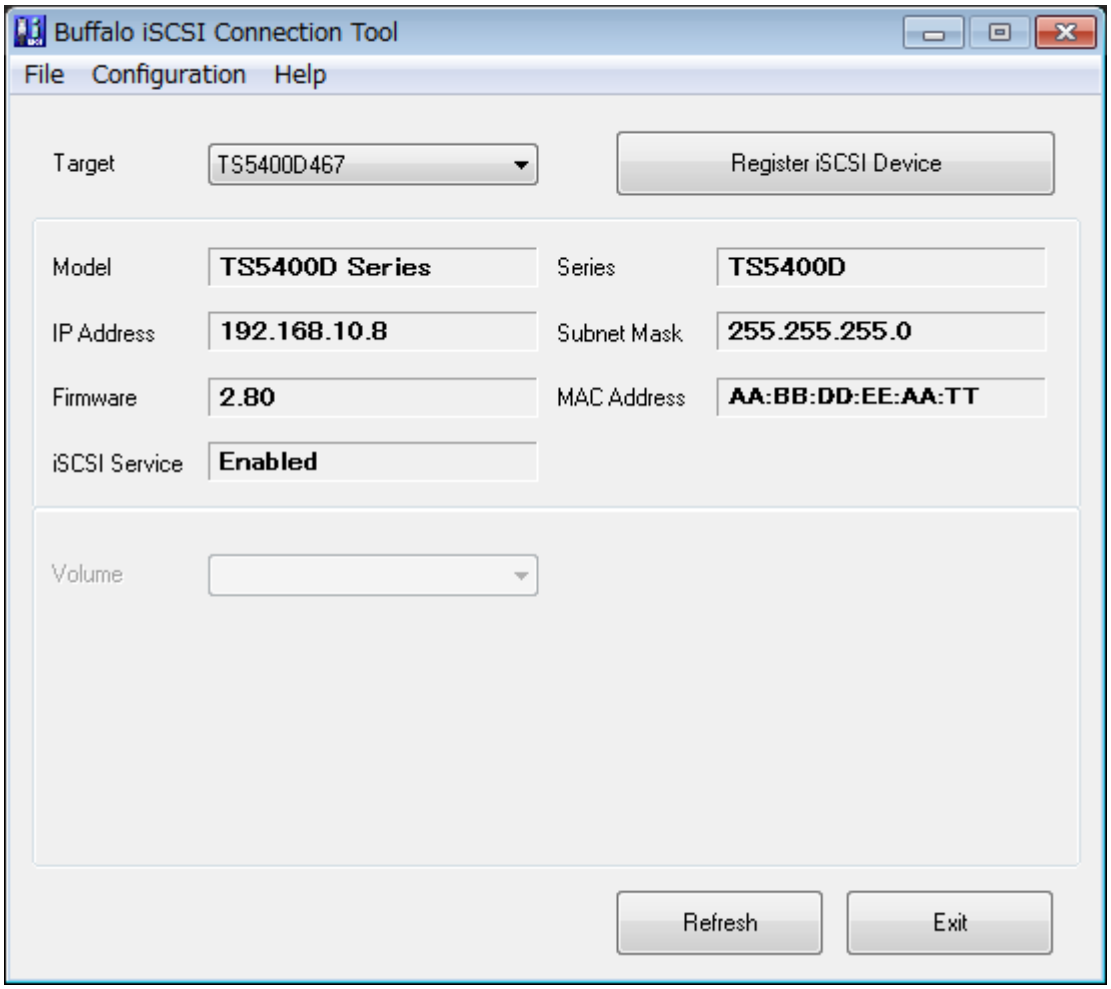
iSCSI Connection Tool

The iSCSI Connection Tool is a Windows utility that lets you use the TeraStation as an iSCSI drive.

Note: If using TeraStation 5000N series models, this software is not included with the TeraNavigator software and cannot be installed from it.

To launch it, click *Start - All Programs - BUFFALO - iSCSI Connection Tool - iSCSI Connection Tool*.

For Windows 8.1 and Windows 8, click *iSCSI Connection Tool*.



Home Screen

Name	Description
Target	If a TeraStation is selected, clicking *Register iSCSI Device* will register all the volumes in the TeraStation to the computer for enabling connection to individual volumes. If a volume is already registered, click *Unregister iSCSI Device* to unregister all volumes, disconnecting them from the TeraStation.
Model	Displays TeraStation's model name.
Series	Displays TeraStation's series name.
IP Address	Displays TeraStation's IP address.
Subnet Mask	Displays TeraStation's subnet mask.
Firmware	Displays TeraStation's firmware version.
MAC Address	TeraStation's MAC address.
iSCSI Service	Shows whether the iSCSI service of the TeraStation is running or stopped.
Volume	Select individual volumes from a registered TeraStation. Select a volume and click *Connect*, then the selected volume will be recognized as a local drive in My Computer on your computer. If a volume is connected, click *Unregister* to disconnect it.

Name	Description
Current status	Displays current status of the selected volume. Disconnected: Volume is disconnected. Connected: Volume is connected. Connected to another PC: Volume is connected to another computer. Displays the other computer's IP address.
User authorization	Disabled: No authentication. Enabled: User authentication is needed to connect to a volume.
Connect on Start Up	If selected, the computer will connect to the volume automatically at boot.
Refresh	Search for network devices on the LAN.
Exit	Exit iSCSI Connection Tool.

Menu

Name		Description
File	Refresh	Search for network devices on the LAN.
	Exit	Closes the iSCSI Connection Tool.
Setup	Configuration	Opens Settings for the selected TeraStation.
	Change IP address	You can change the IP address of the selected TeraStation.
	Unregister iSCSI device	If you disconnect the TeraStation without unregistering it or changing its IP address, the registration information stays in your computer and searches will take longer. For better performance, unregister disconnected TeraStations with this command.
	Set mutual CHAP secret	Set the CHAP password on the computer side.
	Persistent Volume	If checked, your computer will reconnect to the TeraStation whenever it's restarted.
	Connect volumes	Connect multiple volume at a time.
	Disconnect volumes	Displays the screen to disconnect multiple volume at a time.
	Disk management	Format drives.
Help	About	Displays version information.

NovaBACKUP

NovaBACKUP is a Windows utility that lets you back up the data on your computer.

Installing from CD

The installation methods are different depending on which version of TeraNavigator CD you have. If your TeraNavigator CD is version 1.60 for TeraStation 5000 series, and version 1.01 for TeraStation 5000N series or earlier, install NovaBACKUP from the included TeraNavigator CD.

1 Insert the TeraNavigator CD to your computer.

2 Launch TSNavi.exe from the TeraNavigator CD.

3 Click *Options - Additional Software Installation*.

4 Select "NovaBACKUP" and click *Install*. Follow the procedure to finish installing NovaBACKUP.

Installing from Website

If your TeraNavigator CD is version 1.70 for TeraStation 5000 series, and version 1.10 for TeraStation 5000N series or later, install the software from either http://d.buffalo.jp/TS5000/ for TeraStation 5000 series or http://d.buffalo.jp/TS5000N/ for TeraStation 5000N series. Select the region and model to go to the d.buffalo site of your specific product model.

To download the installer, you will need the serial number of your TeraStation. The serial number is printed on the label on the back or top of the unit.

Chapter 12 Appendix

LCD Panel

The LCD panel can be cycled through different modes by pressing the display button on the front of the TeraStation. Also, the items displayed can be configured at *Management - Notifications - Front Panel Display Settings* in Settings.

Modes

LCD Message		Description	Corrective Action
LINK SPEED **Note:** When an Ethernet cable is connected to LAN Port 2, "LINK SPEED 2" is displayed.	LINK SPEED No LINK	Not connected to a network.	Connect an Ethernet cable to the LAN port.
	LINK SPEED 10 Mbps HALF	Connected at 10 Mbps half duplex.	-
	LINK SPEED 10 Mbps FULL	Connected at 10 Mbps full duplex.	-
	LINK SPEED 100 Mbps HALF	Connected at 100 Mbps half duplex.	-
	LINK SPEED 100 Mbps FULL	Connected at 100 Mbps full duplex.	-
	LINK SPEED 1000 Mbps	Connected at 1000 Mbps full duplex.	-
Series Name / Firmware Version	TS5400D Ver. 3.00	Displays the series name and the firmware version. **Note:** This is an example for 4-drive TeraStation models. Depending on the unit model you are using, the series name may be displayed differently.	-
Hostname / IP Address	TSxxxxx xxx 192.168.11.150	Displays the hostname and IP address. At the end of the IP address, F (fixed IP address) or D (IP address automatically acquired from a DHCP server) is displayed. **Note:** When an Ethernet cable is connected to LAN port 2, "NETWORK2" is displayed in the hostname section.	-
Calendar / Clock	DATE TIME 2012/1/1 11:11	Displays the date and time set in the TeraStation.	-

Errors

LCD Message	Description	Corrective Action
BOOT FAIL	Hard drive not found.	Contact Buffalo technical support for assistance.
SYSTEM Error E04 Can't Load Krnl!	The firmware is corrupted.	Contact Buffalo technical support for assistance.

LCD Message	Description	Corrective Action
UPS E10 Dependent Mode	The TeraStation is running on the UPS battery due to a power outage.	Shut down the TeraStation safely and wait until the power outage ends. If certain settings are configured, the TeraStation may shut down automatically when the error is detected.
	If the setting to use the UPS connected to this TeraStation has been configured, the UPS cable may be disconnected.	Verify that the UPS cable or LAN cable is connected properly.
	If the setting to use the UPS connected to another TeraStation on the same network has been configured, the LAN cable of this TeraStation may be disconnected.	
SYSTEM Error E11 Fan Failure	An error occurred in the fan speed.	Check that no foreign objects or dust are clogging the fan. If any foreign objects or dust are found, use a pair of tweezers, air duster, or other tool to remove them. If the error is displayed again, contact Buffalo technical support for assistance.
SYSTEM Error E12 Cooling Failure	A rise in the system temperature may have exceeded the allowable safety value.	Do not place objects in the area around the TeraStation. Also, move the TeraStation to a cool location.
RAID Arrayx E14 Can't Mount	RAID array x cannot be mounted.	Run the RAID array disk check in Settings.
HDx Error E16 HDx Not Found	Unable to find hard drive x.	Hard drive x may be disconnected or may have failed. After shutting down, reinstall the hard drive.
HDx Error E22 HDx Can't Mount	Unable to mount drive x.	Format the hard drive. After formatting, if the error still appears after rebooting, replace the hard drive. If the error is displayed again, contact Buffalo technical support for assistance.
FailOver E27 LostBackupTarget	Unable to find the backup TeraStation.	In the main TeraStation's Settings, navigate to *Backup - Failover* to reconfigure the backup TeraStation for failover.
HDx Broken E30 Replace the DISK	An error occurred, so hard drive x was removed from the RAID array.	Replace hard drive x.

Status

After you change settings or format a hard drive, the current status is displayed on the LCD.

LCD Message	Description	Corrective Action
SYSTEM I10 TOO HOT !	A rise in the system temperature may have exceeded the allowable safety value.	Move the TeraStation to a cool location. Do not place objects in the area around the TeraStation.
HDx Warning I11 Bad Sectors	Drive x has too many bad sectors.	Replace hard drive x.
Operation I12 DEGRADE MODE	Operating in degraded mode.	-
RAID I13 ARRAYxFormatting	Formatting RAID array x.	-

LCD Message	Description	Corrective Action
RAID I14 ARRAYx Checking	Checking RAID array x.	-
RAID I15 ARRAYx Scanning	Examining the error status of RAID array x. **Note:** Transfer speeds are slower during the examination process.	-
RAID I16 ARRAYx Creating	Creating RAID array x.	-
RAID I17 ARRAYx Resyncing	Resynchronizing RAID array x. **Note:** Transfer speeds are slower during resynchronization.	-
RAID I18 ARRAYx Rebuilding	Rebuilding RAID array x. **Note:** Transfer speeds are slower during the rebuilding process.	-
RAID I19 ARRAYx 0 Filling	Writing 0s to RAID array x and erasing all data.	-
RAID I20 DISKx Formatting	Formatting hard drive x.	-
RAID I21 DISKx Checking	Checking hard drive x.	-
RAID I22 DISKx 0 Filling	Writing 0s to hard drive x and erasing all data.	-
SYSTEM I25 F/WUPDATING	Updating the TeraStation firmware. **Note:** Do not turn off the power during the updating process.	-
Web Setting I26 Initializing	Initializing all settings.	-
USB Diskx I27 Checking	Checking USB hard drive x.	-
USB Diskx I28 Formatting	Formatting USB hard drive x.	-
Press FuncSW I31 New Diskx ready	Displays when pressing the function button to rebuild the RAID after replacing hard drive x.	Press the function button to rebuild the RAID array.
Set From Web I32 New Diskx ready	Displays after replacing hard drive x when the RAID needs to be rebuilt in Settings or formatting is necessary.	In Settings, either rebuild the RAID array or format the hard drive.
Replication I33 ReplicateFailure	An error occurred in replication, or synchronization between the main TeraStation and the backup TeraStation failed during failover configuration.	In Settings, navigate to *Backup - Replication* and click *Resync* to execute resynchronization. If the error is displayed again, contact Buffalo technical support for assistance.
Virus alert I34 Virus detected	A virus scan found a virus.	Once the virus is removed from the quarantine folder, the message is no longer displayed. If the antivirus software is configured to delete viruses from the quarantine folder automatically, then the message will not be displayed.
Cartridgex I35 Location error	A hard drive set as a media cartridge has been installed in the drive x slot.	Connect to the slot that was set as a media cartridge.

LCD Message	Description	Corrective Action
Cartridgex I36 Decryption error	The media cartridge cannot be decrypted. The media cartridge may have been encrypted by a TeraStation other than this product.	Connect the drive to the TeraStation that performs encryption to decrypt the drive.
Recovery I37 SystemRecovering	System recovery in progress.	-
Recovery I38 RecoveryFinished	System recovery is complete.	-
Recovery I39 Change Boot	System recovery from the USB recovery device is complete.	Change the boot mode switch on the rear to "HDD".
Recovery I40 DataWillDeleted	Beginning recovery. All data on the drive will be deleted.	-
Recovery I41 PushFuncToStart	Press the function button on the front to start the recovery process.	-
Recovery I42 Preparing	Preparing to start the recovery process.	-
Recovery I43 Unsupported HW	The TeraStation was started from the USB recovery device, but the system cannot be recovered from this USB recovery device.	-
Recovery I44 Disk1 not found	Recovery from the USB recovery device was initiated, but drive 1 was not detected.	Make sure that drive 1 is present and fully inserted in its slot.
Recovery I45 Recovery Failed	Recovery failed.	-
RAID ARRAY I46 RMM+Processing	Data migration or conversion (RAID migration) is in progress.	Do not turn off the TeraStation's power.
SYSTEM I47 Don't Power Off		
FailOver I48 PushFuncToStart	This TeraStation is ready to become the failover backup for the main TeraStation.	Hold down the function button on the front of the target TeraStation until it stops beeping to accept failover backup status.
FailOver I49 LostMainTarget	The main TeraStation in the failover configuration cannot be found.	Make sure that the main TeraStation is on, working, and connected to the network.
FailOver I50 Maintenance mode	Failover maintenance is in progress.	Do not turn off the TeraStation's power.
FailOver I51 Initializing	Initializing the failover configuration.	Do not turn off the TeraStation's power.
New Firmware I52 Available	A new firmware version has been released.	Update the firmware.
BackupTask xx I54 Backup Failure	The xxth backup job failed.	Make sure that the backup job is configured correctly. Make sure that the NAS is on and not in standby mode. If the backup job still fails, check the status of NAS, network, and backup source and destinations.

LCD Message	Description	Corrective Action
Recovery I55 RecoveryAuthFail	Authentication during recovery of settings failed.	Settings can only be restored for the TeraStation whose settings were originally saved. To restore settings, insert the USB memory device, move the Boot Mode switch on the rear of the TeraStation to the USB position, and restart the TeraStation. Or, settings can be restored from Settings with the TeraStation powered on.
Surveillance I56 Lack of License	There are not enough surveillance camera server licenses.	Purchase and register an additional license.
Surveillance I57 No free space	There is not enough space to record additional surveillance videos.	Delete or move some of the stored videos.
Surveillance I58 Recording Failure	Video not recorded.	Check your settings. Also, use the utilities provided with your camera to check that the camera is operating correctly.

Default Settings

Administrator's Name	admin	
Password	password	
Shared Folders	"share" (for both Windows and Mac computers). The recycle bin is enabled on "share" by default.	
DHCP Client	Normally, the TeraStation will get its IP address automatically from a DHCP server on the network. If no DHCP server is available, then an IP address will be assigned as follows: IP Address: 169.254.xxx.xxx (xxx is assigned randomly when booting the TeraStation.) Subnet Mask: 255.255.0.0	
Registered Groups	"hdusers", "admin", and "guest" You cannot edit or delete these default groups.	
Microsoft Network Group Settings	WORKGROUP	
Ethernet Frame Size	1500 bytes (not including 14 bytes of header and 4 bytes of FCS)	
SMB	Enabled	
	SMB2 Protocol	Enabled
	Recycle Bin Permissions	All users
	Exclude Mac OS temp files from recycle bin	Yes
DFS	Disabled	
AFP	Enabled	
FTP	Disabled	
SFTP	Disabled	
WebAccess	Disabled	
NFS	Disabled	
RAID Scanning	Disabled	
iSCSI	Disabled	
DLNA Server	Disabled	
iTunes Server	Disabled	
Squeezebox Server	Disabled	

Print Server	Enabled
Web Server	Disabled
MySQL Server	Disabled
WebAccess Remote	Disabled
Cloud Storage	Disabled
Dropbox Sync	Disabled
BitTorrent	Disabled
TeraSearch	Disabled
Surveillance Cameras	Disabled
Antivirus	Disabled
SNMP	Disabled
Time Machine	Disabled
Direct Copy	Disabled
NTP	Enabled
Email Notification	Disabled
Boot Authentication	Disabled
RAID Mode	TS5200D, TS5200DN, TS5200DWR: RAID 1 TS5400DN, TS5400DWR, TS5400R, TS5400RH, TS5400RN, TS5400RWR, TS5600D, TS5600DN, TS5800D, TS5800DN, TS5800DWR: RAID 5

Specifications

Check the Buffalo website for information about the latest products and specifications.

LAN Interface	Standards Compliance	IEEE 802.3ab (1000BASE-T), IEEE 802.3u (100BASE-TX), IEEE 802.3 (10BASE-T)
	Data Transfer Rates	10/100/1000 Mbps (auto sensing)
	Number of Ports	2
	Connector Type	RJ-45 8-pin (auto MDI-X)
	Supported Protocols	TCP/IP
	Network File Services	SMB/CIFS, AFP, FTP/SFTP, NFS
	Jumbo Frames	1500, 4084, 7404, and 9216 byte modes are supported. (not including 14 bytes of header and 4 bytes of FCS)
USB Interface	Standards Compliance	USB 3.0/2.0
	Data Transfer Rates	USB 3.0: Max. 5 Gbps USB 2.0: Max. 480 Mbps
	Number of Ports	TS5200D, TS5200DN, TS5200DWR, TS5400D, TS5400DN, TS5400DWR: 2 x USB 3.0, 2 x USB 2.0 TS5400R, TS5400RH, TS5400RN, TS5400RWR, TS5600D, TS5600DN, TS5800D, TS5800DN, TS5800DWR: 3 x USB 3.0, 2 x USB 2.0
	Connector Type	Type A
Other Interfaces	1 x D-sub 9 pin (male) port	

Internal Hard Drives	Number of Drive Bays	TS5200D, TS5200DN, TS5200DWR: 2 TS5400DN, TS5400DWR, TS5400R, TS5400RH, TS5400RN, TS5400RWR: 4 TS5600D, TS5600DN: 6 TS5800D, TS5800DN, TS5800DWR: 8
	Drive Interface	SATA 3 Gbps
	Supported RAID Levels	TS5200D, TS5200DN, TS5200DWR: 0, 1, JBOD (individual drives) TS5400DN, TS5400DWR, TS5400R, TS5400RH, TS5400RN, TS5400RWR: 5, 6, 10, 1, 0, JBOD (individual drives) TS5600D, TS5600DN: 5, 51, 50, 6, 10, 1, 0, JBOD (individual drives) TS5800D, TS5800DN, TS5800DWR: 5, 51, 50, 6, 61, 60, 10, 1, 0, JBOD (individual drives)
	Replacement Drive	TeraStation 5000WR and 5000N series: Buffalo OP-HDWR series drive TS5400RH: Buffalo OP-HDH series drive TeraStation 5000 series: Buffalo OP-HDS series drive **Note:** The new drive should be the same size or larger as the replaced drive. The drives listed above are available from the Buffalo website.

Other	Power Supply	AC 100–240 V, 50/60 Hz
	Dimensions (D x W x H, excluding protruding parts)	TS5200D, TS5200DN, TS5200DWR: 230 x 170 x 170 mm; 9.1 x 6.7 x 6.7 in TS5400D, TS5400DN, TS5400DWR: 230 x 170 x 215mm; 9.1 x 6.7 x 8.5 in TS5400R, TS5400RH, TS5400RN, TS5400RWR: 430 x 45 x 430 mm; 16.9 x 1.7 x 16.9 in TS5600D, TS5600DN: 230 x 170 x 260 mm; 9.1 x 6.7 x 10.2 in TS5800D, TS5800DN, TS5800DWR: 230 x 300 x 215 mm; 9.1 x 11.8 x 8.5 in
	Weight	TS5200D, TS5200DN, TS5200DWR: Approx. 4.0 kg; 8.8 lb TS5400D, TS5400DN, TS5400DWR: Approx. 7.5 kg; 16.5 lb TS5400R, TS5400RH, TS5400RN, TS5400RWR: Approx. 9.0 kg; 19.8 lb TS5600D, TS5600DN: Approx. 10.0 kg; 22.1 lb TS5800D, TS5800DN, TS5800DWR: Approx. 12.0 kg; 26.5 lb
	Power Consumption (Max.)	TS5200D, TS5200DN, TS5200DWR: 47 W TS5400D, TS5400DN, TS5400DWR: 86 W TS5400R, TS5400RH, TS5400RN, TS5400RWR: 140 W TS5600D, TS5600DN: 120 W TS5800D, TS5800DN, TS5800DWR: 170 W
	Operating Environment	Temperature: 5–35°C; 41–95°F Humidity: 20–80% (no condensation)
	Compatible Devices	Windows PCs, tablets, and Mac computers with wired or wireless Ethernet connection. **Note:** The TeraStation requires an Ethernet connection with your computer for operation. It cannot be connected via USB.
	Supported OS	Windows 10*, 8.1*, 8*, 7*, Vista*, XP, XP Media Center Edition (2004 or 2005) Windows Server 2012 R2, 2012, 2008 R2, 2008, 2003 R2, 2003 Windows RT 8.1, Windows RT macOS 10.12, 10.11, 10.10, 10.9, 10.8, 10.7, 10.6, 10.5, 10.4**, 10.3.9** * 32-bit and 64-bit ** TeraStation 5000 series only.

Chapter 13 Regulatory Compliance Information

For Customers in the United States

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.
Only use the cables and accessories that are included in the package. Don't use other accessories or cables unless specifically instructed to in the documentation.

UL and MET

CAUTION: Slide/rail mounted equipment is not to be used as a shelf or a work space.
Ne déposez jamais des instruments au dessus de l'appareil et ne l'utilisez jamais comme un tiroir.

Proposition 65

WARNING:
This product and its components contain chemicals known to the State of California to cause cancer and birth defects, or reproductive harm. Wash hands after handling.

For Customers in Europe

CE

Dansk
Dette er et Klasse A-produkt. I et hjemmemiljø kan dette produkt skabe radiointerferens, hvormed det kan være nødvendigt for brugeren at tage passende forholdsregler.
Dette produkt kan forårsage interferens hvis det bruges i beboelsesområder. En sådan anvendelse skal undgås, medmindre brugeren tager specielle foranstaltninger for at reducere elektromagnetiske emissioner for at forhindre interferens med modtagelse af radio- og tv-udsendelser.

Der må kun bruges de kabler og det tilbehør der er inkluderet i pakken. Der må ikke bruges andet tilbehør eller kabler, medmindre det er udtrykkeligt beskrevet i dokumentationen.
Brug ikke USB-kabler, der er 3 meter eller længere for at tilslutte USB enheder til denne TeraStation serie.

Deutsch
Dies ist ein Produkt der Klasse A. In einer häuslichen Umgebung kann dieses Produkt Funkstörungen verursachen. Um diese zu beheben, müssen ggf. entsprechende Maßnahmen ergriffen werden.
Bei einer Nutzung in Wohngebieten können bei diesem Produkt Störungen auftreten. Eine solche Nutzung soll vermieden werden, außer der Nutzer ergreift bestimmte Maßnahmen, um elektromagnetische Strahlung zu reduzieren und Störungen der Radio- und Fernsehübertragung zu vermeiden.
Verwenden Sie ausschließlich die Kabel und Zubehörteile, die im Lieferumfang enthalten sind. Andere Zubehörteile oder Kabel dürfen nur dann verwendet werden, wenn dies in der Dokumentation ausdrücklich vorgeschrieben ist.
Verwenden Sie keine USB-Kabel, die 3 Meter lang oder länger sind, um USB-Geräte an TeraStation dieser Serie anzuschließen.

English
This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.
This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.
Only use the cables and accessories that are included in the package. Don't use other accessories or cables unless specifically instructed to in the documentation.
Do not use USB cables that are 3 meters or longer to connect USB devices to this TeraStation series.

Español
Este es un producto de Clase A. En una situación domestica, este producto puede producir interferencias de radio, en ese caso el usuario deberá tomar las medidas adecuadas.
Este producto puede causar interferencias al utilizarlo en áreas residenciales. Debe evitarse utilizarlo así, salvo si el usuario adopta medidas especiales para reducir las emisiones electromagnéticas e impedir que se produzcan interferencias con la recepción de emisiones de radio y televisión.
Utilice únicamente los cables y accesorios incluidos en el paquete. No utilice otros accesorios ni cables a menos que así se indique en la documentación.
Utilice cables de una longitud inferior a 3 metros para conectar los dispositivos USB a este tipo de TeraStation.

Français
Cet appareil est un produit de Classe A. Dans un environnement domestique, ce produit est susceptible de provoquer des interférences radio, auquel cas l'utilisateur peut être mis en demeure de prendre des mesures appropriées.
Utilisé dans un environnement domestique, cet appareil génère des interférences. Ce type d'utilisation est donc à éviter si l'utilisateur n'a pas pris de mesures spécifiques visant à réduire les émissions électromagnétiques pour éviter les interférences avec la réception de programmes de radio et de télévision.
Utilisez uniquement les câbles et accessoires inclus dans ce package. N'utilisez aucun autre accessoire ou câble sauf instruction spécifique de la documentation.
Utilisez des câbles d'une longueur de moins 3 mètres pour connecter les périphériques USB à ce type de TeraStation.

Italiano
Questo è un prodotto di Classe A. In ambienti domestici il prodotto può causare radiointerferenza, nel qual caso potrebbe rendersi necessaria l'adozione di opportune misure.

Questo prodotto può causare interferenze se usato in zone residenziali. Evitare l'uso in queste zone a meno che l'utente non intraprenda azioni specifiche per ridurre le emissioni elettromagnetiche e impedire le interferenze alla ricezione di trasmissioni radio-televisive.
Utilizzare esclusivamente i cavi e gli accessori inclusi nell'imballaggio. Non utilizzare altri accessori o cavi a meno che non sia specificamente indicato nella documentazione.
Non utilizzare cavi USB lunghi 3 metri o più per collegare dispositivi USB a questa TeraStation.

Nederlands
Dit is een Klasse A product. Dit product kan in een huishoudelijke omgeving radiostoring veroorzaken in welk geval de gebruiker adequate maatregelen dient te nemen.
Dit product kan storing veroorzaken wanneer gebruikt in woongebieden. Dergelijk gebruik dient te worden vermeden tenzij de gebruiker speciale maatregelen treft om de elektro-magnetische uitstraling te beperken zodat storing van de ontvangst van radio- en televisieuitzendingen wordt voorkomen.
Gebruik alleen de kabels en toebehoren die zich in de verpakking bevinden. Gebruik geen ander toebehoren of kabels tenzij dit uitdrukkelijk in de handleiding wordt aangegeven.
Gebruik geen USB-kabels die 3 meter of langer zijn om USB-apparaten met deze TeraStation series te verbinden.

Norsk
Dette er et produkt i klasse A. I et hjemmemiljø kan dette produktet forårsake radiointerferens, noe som gjør at brukeren i så fall må foreta passende tiltak.
Dette produktet kan forårsake interferens dersom det brukes i boligområder. Slik bruk må unngås med mindre brukeren tar spesielle tiltak for å redusere elektromagnetisk stråling for å unngå interferens med mottak av radio- og TV-sendinger.
Bruk kun kabler og tilbehør som er inkludert i pakken. Ikke bruk annet tilbehør eller kabler med mindre spesielt instruert til å gjøre det i dokumentasjonen.
Bruk ikke USB-kabler på tre meter eller mer for å koble USB-enheter til denne TeraStation-serien.

Português
Este é um produto de Classe A. Num ambiente doméstico, este produto pode provocar interferências de rádio, pelo que o utilizador poderá ter de tomar medidas adequadas.
Este produto poderá causar interferências se utilizado em áreas residenciais. A utilização deverá ser evitada, salvo se o utilizador tomar medidas especiais para reduzir as emissões electromagnéticas e assim prevenir interferências na recepção de rádio e televisão.
Utilizar apenas cabos e acessórios incluídos na embalagem. Não utilizar outros acessórios ou cabos, salvo se especificamente indicado na documentação.
Não usar cabos USB de 3 metros ou mais para ligar dispositivos USB a esta série TeraStation.

Suomi
Tämä on luokan A tuote. Tämä tuote voi aiheuttaa radiohäiriöitä kotikäytössä, jolloin käyttäjän on ehkä ryhdyttävä tarvittaviin toimenpiteisiin.
Tämä tuote saattaa aiheuttaa häirintää, jos sitä käytetään asuinalueella. Sellaista käyttöä on vältettävä, ellei ryhdytä erityistoimenpiteisiin sähkömagneettisen säteilyn vähentämiseksi häiriöiden estämiseksi radio- ja televisiolähetyksissä.
Käytä ainoastaan pakkauksen mukana toimitettuja kaapeleita ja varusteita. Älä käytä muita varusteita tai kaapeleita ellei näin ole erityisesti ohjeistettu asiakirjoissa.
Älä käytä 3m tai pitempiä USB-kaapeleita USB-laitteiden liittämiseen näille TeraStation-sarjoille.

Svensk

Detta är en Klass A-produkt. I en hushållsmiljö kan denna produkt orsaka radiostörningar, och användaren kan i så fall begäras att vidta lämpliga åtgärder.
Den här produkten kan oraka störningar om den används i bostadsområden. Sådan användning måste undvikas om inte användaren vidtar speciella åtgärder för att minska elektromagnetiska sändningar för att förhindra störningar i mottagningen av radio- och tv-sändningar.
Använd bara kablar och tillbehör som ingår i förpackningen. Använd inte andra tillbehör eller kablar om du inte får uttryckliga instruktioner om det i dokumentationen.
Använd inte USB-kablar som är 3 meter eller längre för att ansluta USB-enheter till den här TeraStation-serien.

Türk
Bu, A Sınıfı bir üründür. Evde kullanım sırasında bu ürün radyo girisimine yol açabilir ve bu durumda kullanıcının gerekli önlemleri alması gerekebilir.
Bu ürün yerleşim bölgelerinde kullanılırsa parazite neden olabilir. Kullanıcı radyo ve televizyon yayınlarında paraziti önlemek üzere elektromanyetik salınımları azaltacak özel önlemler almadıkça bu şekilde kullanımdan kaçınılmalıdır.
Yalnızca pakette bulunan kablo ve aksesuarları kullanın. Belgelerde özellikle belirtilmedikçe başka aksesuar ve kablolar kullanmayın.
USB aygıtları bu TeraStation serisine bağlamak için 3 metre ve daha uzun USB kabloları kullanmayın.

CB

The socket-outlet shall be installed near the equipment and shall be easily accessible.

Norsk
Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare.
For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet.

Svensk
Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrusningen och kabel-TV nätet.

For Customers in Russia

TR-CU

Country of Origin	Made in China or Made in Japan
Manufacturer	Buffalo Inc. Akamondori Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315, Japan
For manufacturing date and country, refer to the product package. Дату изготовления и страну-производителя см. на упаковке. Өнімнің шығарылу мерзімі мен мемлекеті бойынша ақпараттықаптамадан қараңыз. Дату и краіну вырабу гл. на ўпакоўцы.	

For Customers in China

CCC

插座应当装在设备的附近,而且应当便于触及到
产品标准号: GB4943.1-2011 GB9254-2008 (CLASS A) GB17625.1-2012

警　告
此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

For Customers in Taiwan

BSMI

警告使用者：
此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

For Customers in Korea

KC

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