TeraStation User Guide

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Chapter 1
Diagrams and Layout

TeraNavigator Setup

To configure your TeraStation, follow the procedure described below.

1 Insert the TeraNavigator CD into your computer. TeraNavigator will launch. Click [Begin Installation]. The wizard will guide you through installation.


Follow the steps on the screen to connect the TeraStation's Ethernet and power cables and turn it on.

Notes:
- If TeraNavigator does not open automatically, navigate to the TeraNavigator CD and double-click the ⬤ icon [TSNavi.exe].
- Use LAN port 1 for initial setup. After setup, you may connect a second cable to LAN port 2. If used, configure the IP address of LAN port 2 at [Network] - [Setting] - [IP Address Settings] in the Web Admin interface or NAS Navigator2.
- If you are using Windows 7 or Vista, the autoplay screen may appear. Click [Run TSNavi.exe].
- If "Do you want to allow the following program to make changes to this computer ?" is displayed in Windows 7, click [Yes].
- If "A program needs your permission to continue" is displayed in Windows Vista, click [Continue].
- For Mac OS, open the CD and double-click on the [TeraNavigator] icon.
- Disable your anti-virus software and firewall before continuing. You may not be able to install the software if anti-virus software or a software firewall are enabled. After you've finished setup, re-enable your firewall and antivirus software.

TS-8VHL, TS-6VHL
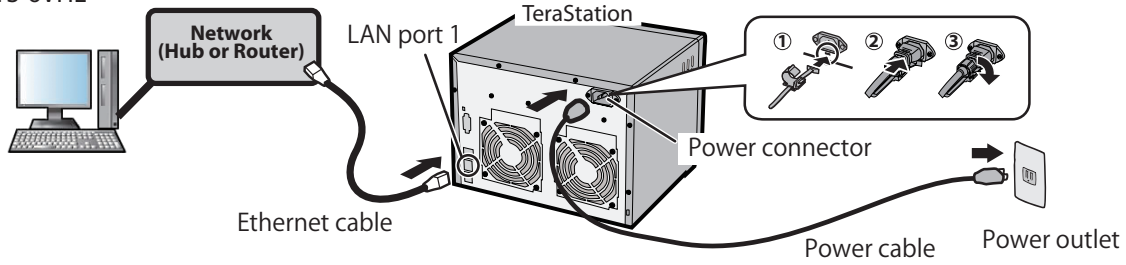
TS-QVHL
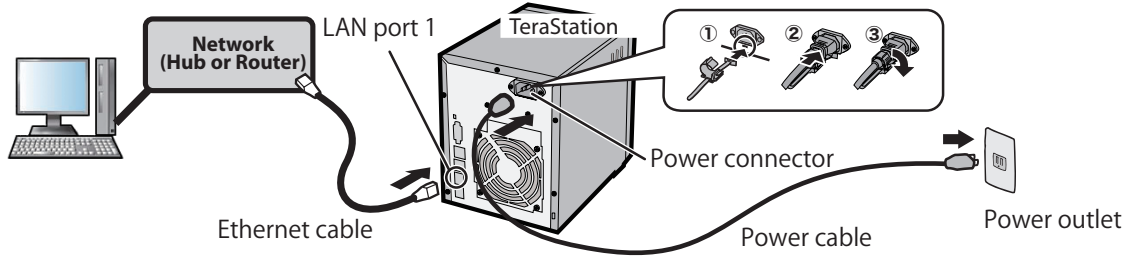
TS-WVHL

TS-RVHL

2 Click [Complete]. NAS Navigator2 will start automatically.

3

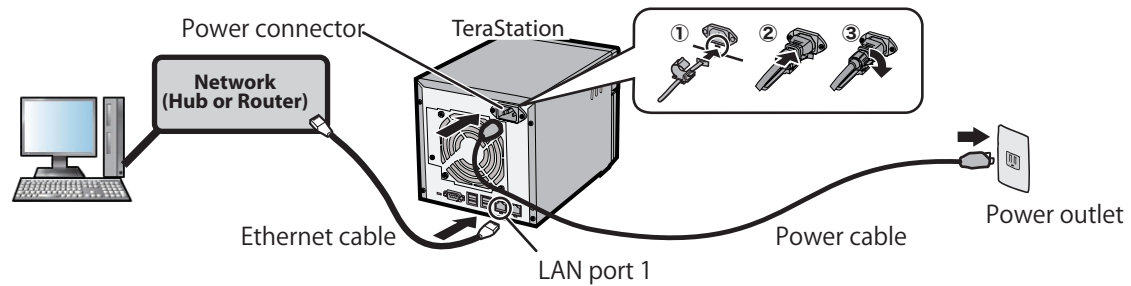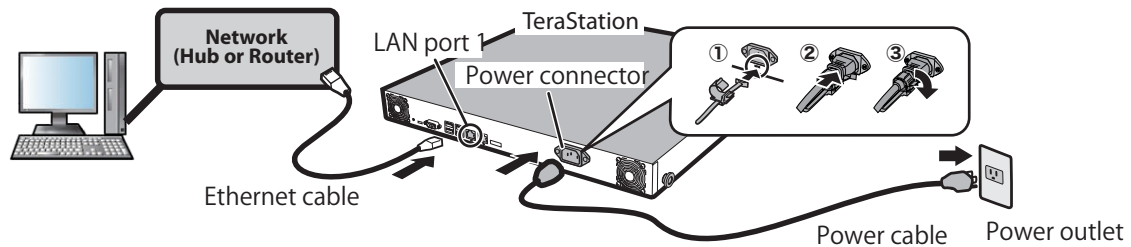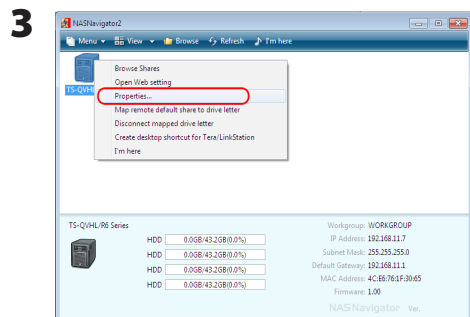Right-click on your TeraStation's icon, then choose [Properties] - [IP Settings].

Note:
For Mac OS, hold the Control key, click on the TeraStation icon, then click [Configure] - [IP Address].

4
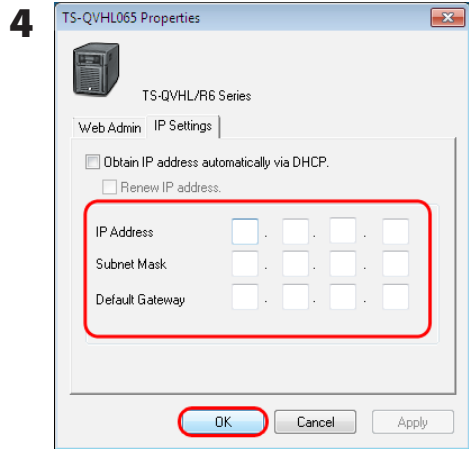
1 Enter the desired settings.

Note:
If you don't know how to configure these settings, click [Obtain IP address automatically via DHCP] to check the box. For Mac OS, click [Use DHCP].

2 Click [OK].

Note:
If you are prompted to enter the administrator's password, enter the TeraStation's password (it is set to "password" by factory default).

Continue to set the TeraStation's clock.

5 Right-click on the TeraStation icon in NAS Navigator2 and choose [Open Web setting].
Notes:
• For Mac OS, hold the Control key, click the TeraStation icon, and click [Open Web setting].
• The Web Admin interface requires Firefox 1.5 or later, Internet Explore 6.0 Service Pack 2 or later, or Safari 3 or later.

6
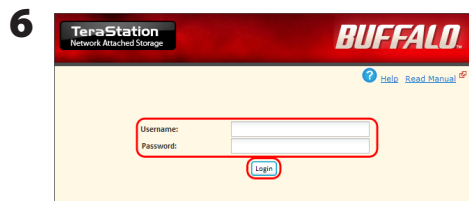
Enter your username and password, then click [Login].
Note: The default settings are:
Username: **admin**
Password: **password**

Note:
• The default language for the Web Admin interface is English. To change the display language, click [System] - [Settings] - [Language] - [Modify Settings], select [Display Language], and click [Save].

7 In the Web Admin interface, navigate to [System] - [Settings] - [Date and Time], then click [Modify Settings].

8
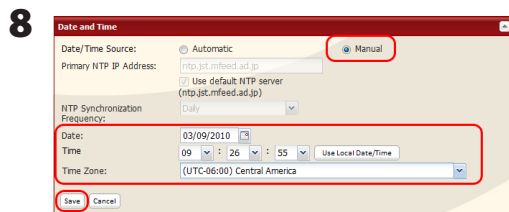
1 To manually configure the date and time, select [Manual] and adjust [Date], [Time], and [Time Zone].

Note:
Click [Use Local Date/Time] to use your computer's time (or Time Zone) for the TeraStation's time.

2 Click [Save].

Notes:
- By default, the TeraStation will attempt to use an NTP server to set the time.
- NTP may not be usable in some network environments.
- Please read the terms of use for Internet Multifeed Co. at www.jst.mfeed.ad.jp. Internet Multifeed Co. is the group that manages this NTP Server. Internet Multifeed Co. is not responsible for any loss or damages caused by this service.
- Buffalo Technology is not responsible for any loss or damage caused by using of this service, stopping the service, or missing service.
- If your TeraStation fails to automatically obtain the time from an NTP Server, verify the TeraStation's DNS server address settings. You must set a primary DNS server address to specify an NTP server by host name. Otherwise you will have to specify the DNS server by IP address. You can change the DNS server settings at [Network] - [Settings] - [IP Address Settings] in the Web Admin interface.

9 The following settings changes are recommended.

Change your administration password

We recommend that you change the default password to a secure password.

1 In the Web Admin interface, navigate to [Users/Groups] - [Local Users] .

2 Select [admin] from the user list and click [Edit User].

3 -1 Enter a new password (twice).
   -2 Click [Save].

Your administrator password is now changed.

Configure RAID Scanning

RAID Scanning checks your RAID arrays for problems and automatically fixes any errors it can. To configure:

1 In the Web Admin interface, navigate to [System] - [Storage] - [RAID Scanning] - [Modify Settings].
2 Click [Enable] for [RAID Scanning].
3 Select the schedule to perform RAID Scanning.
 Note: With [Immediate] checked, RAID Scanning will run immediately.
4 Click [Save].

You have completed the settings for RAID Scanning.

10
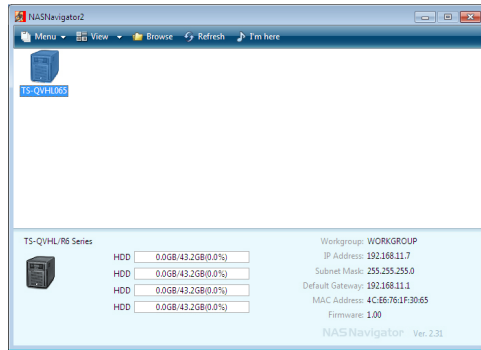
Double-click on your TeraStation's icon.

Note:
This example show a TS-QVHL TeraStation model. Your screen may be slightly different.

11 The TeraStation's shared folders are displayed.
Note: In OS X, your TeraStation is mounted as a drive icon on the desktop and displayed in the sidebar of the Finder.

Setup is now complete. You can now use the TeraStation's shared folders to save files just like any other folders.

Note:
• Keep the TeraStation updated with the latest firmware. You can download the latest firmware from *www.buffalotech.com*. The currently installed firmware version is displayed on the main screen of NAS Navigator2.

Diagrams and Layout

TS-8VHL, TS-6VHL

Front View
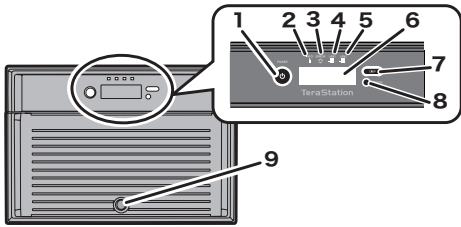
Rear View

with cover removed

TS-QVHL

Front View

Rear View

TS-WVHL

Front View

Rear View

TS-RVHL

Front View

with cover attached

with cover removed
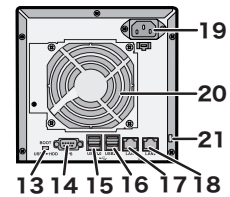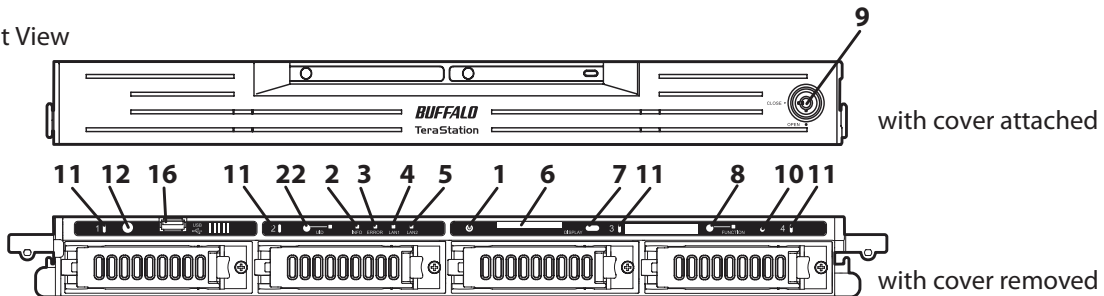
Rear View
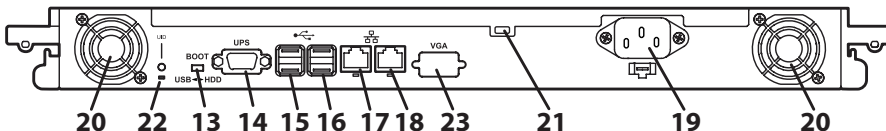
1 Power Button

Power on: Press the power button to turn on.
Power off: Press the power button twice in 3 seconds.
Note: To power on, connect the power cable and wait for 10 seconds. Then press the power button.
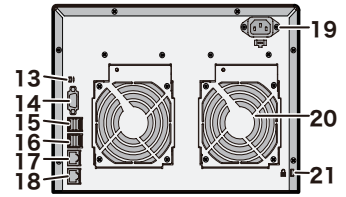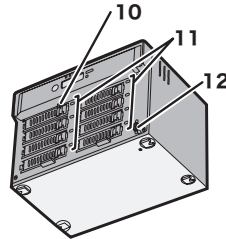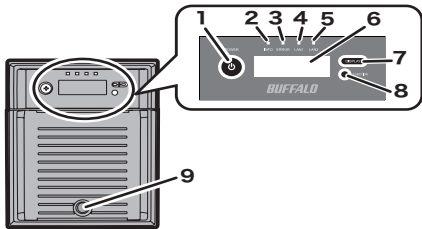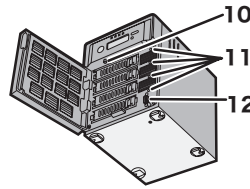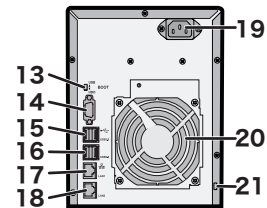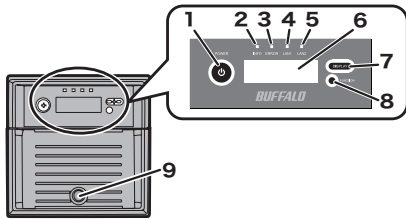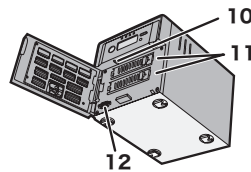
2 Info LED

If there is a message about the current status, the amber info LED is illuminated. Check the LCD panel for current status.

3 Error LED

The red error LED is illuminated when an error occurs. Check the LCD panel for more information.

4 LAN1 LED

When LAN port 1 is connected to a network, it is illuminated in green. The light next to LAN port 1 will be illuminated as well.

5 LAN2 LED

When LAN port 2 is connected to a network, it is illuminated in green. The light next to LAN port 2 will be illuminated as well.

6 LCD Panel

Displays the status of the TeraStation.

7 Display Button

Switches between the different display modes.

8 Function Button

Use this button to perform the following operations:
• DirectCopy
• Removal of USB devices
• Rebuild RAID array after replacing hard drives
• Failover (Backup TeraStation)

9 Drive Lock

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

10 Reset Button

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

11 Status LEDs

LEDs 1 through 8 will glow green when the corresponding hard drives are accessed. If a drive fails, the corresponding LED will glow or flash red (or just flash amber).

12 Factory Use Only

13 Boot Mode Switch

This is a switch used for the TS-6VHL/E, TS-8VHL/E, TS-QVHL/E, TS-WVHL/E, and TS-RVHL/E TeraStation models. Normally, use this switch at the default setting of [HDD]. Do not change the switch to the [USB] position.

14 UPS Port

Connect a UPS (Uninterruptible Power Supply).

15 USB 3.0 Port

Compatible Buffalo USB 3.0 hard drives can be connected. USB hubs are not supported.
Note: TS-8VHL TeraStation models do not have this port.

16 USB 2.0 Port

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

17 LAN Port 1

Connect to a router, hub, or switch on your Ethernet network.

18 LAN Port 2

Use this second Ethernet port for redundancy or backup. For backup, a second TeraStation may be connected directly.

19 Power Connector

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

20 Fan

Do not block the fan while the unit is running.

21 Anti-Theft Security Slot

You can connect an off-the-shelf wire lock to this slot.

22 UID Button

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

23 Factory Use Only

Only TS-RVHL TeraStation models have this port.

Chapter 2
Using your TeraStation

Opening a Shared Folder

1   Launch NAS Navigator2.

      Notes:

        • For Windows, double-click the [Buffalo NAS Navigator2] icon on your desktop.

        • For a Mac, double-click on the [NAS Navigator2] icon in the Dock.
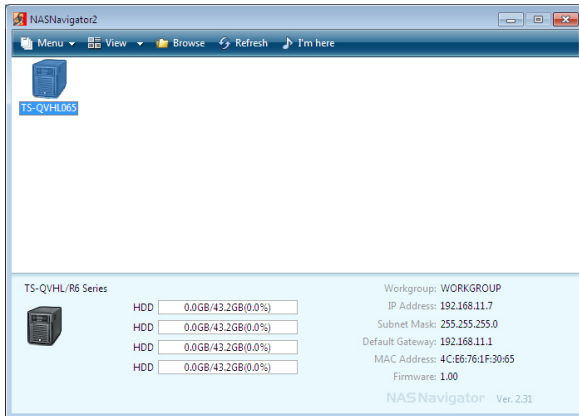
2   Double-click on the TeraStation icon.

3   The TeraStation's Shared folders are displayed.

      Note:

      With a Mac, the TeraStation is mounted as a drive icon on the desktop, and displayed in the sidebar of the [Finder].

You can now use the TeraStation's shared folders to save files just like other hard drives.

Opening a Shared Folder from a Second PC

Once you've connected the first computer to the TeraStation, you don't have to run the setup program again to connect additional computers. Just install NAS Navigator2 on each additional computer and use it to open the TeraStation's shared folder as necessary.

1   Insert the TeraNavigator CD into your computer. TeraNavigator will launch.

Notes:

• For Windows 7/Vista, click [Run TSNavi.exe] when the auto-play screen is displayed.

• If [A program needs your permission to continue] is displayed, click [Continue].

• For Mac OS, double-click on the [TeraNavigator] icon in the utility CD.

2   Click [Install NAS Navigator].

Note:

If this screen doesn't open, open the CD and double-click on the icon (TSNavi.exe).

3   Step through the wizard to install NAS Navigator2.

4   After NAS Navigator2 is installed, click the in the right top right corner of the window to close the installer. Then, use NAS Navigator2 to open the TeraStation's shared folder.

5   Launch NAS Navigator2.

    Note:

    • For Windows computers, double-click the [Buffalo NAS Navigator2] icon on the Desktop.

    • For a Mac, double-click the [NAS Navigator2] icon in the Dock.

6   Double-click on the TeraStation icon.
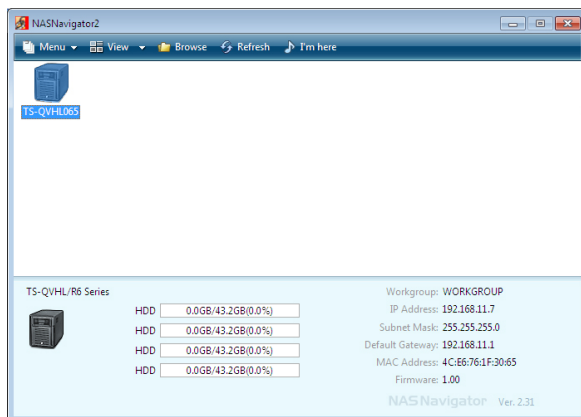
7   The TeraStation's Shared folders are displayed.

    Note:

    With a Mac, the TeraStation is mounted as a drive icon on the desktop, and displayed in the sidebar of the [Finder].

You can now use the TeraStation's shared folders to save files just like other hard drives.

Adding Additional TeraStations

Run the TeraNavigator installation program from the CD for each TeraStation that you add to the network. You cannot set up multiple TeraStations at the same time.

Opening the Web Admin interface

To configure your TeraStation, use the Web Admin interface from a browser on a computer connected to the same network.
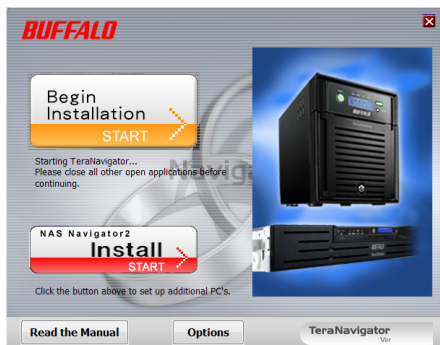
1 Launch NAS Navigator2. For Windows, click on the [BUFFALO NAS Navigator2] icon on your desktop. For Mac OS X, double-click on the [NAS Navigator2] icon in the Dock.

2
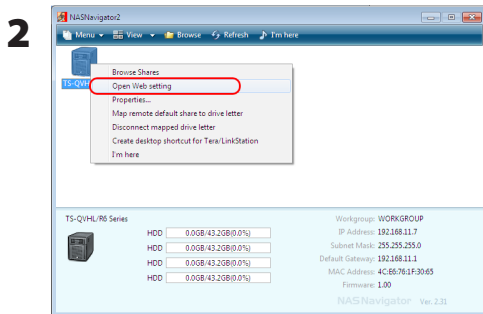
Right-click on the TeraStation icon (on Mac OS X, click the icon while holding down the control key) and select [Open Web setting] from the menu.

Notes:

• If multiple TeraStations and TeraStations are connected to the network, multiple icons will be displayed. Click on the correct TeraStation.

• Record the TeraStation's IP address from the bottom right of the NAS Navigator2 window.

3
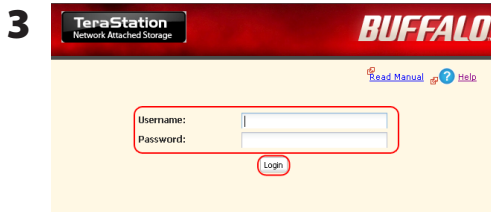
1 Enter your username and password, and click [Login]. Initially, use the default username and password:
Username: **admin**
Password: **password**

2 After you log in, change the password for security.

Note:

• To login as a guest, type "guest" for the Username, leave the password blank, and click [OK]. Guests can check the TeraStation's name, IP address, workgroup, and disk status. Regular users can change their login passwords as well as check the TeraStation name, IP Address, workgroup, and disk status. Administrator user, "admin" by default, can configure all options.

4
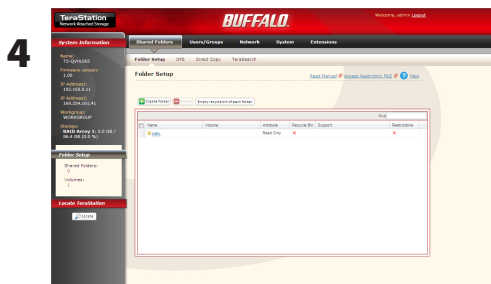
This is the Web Admin interface. This page displays the TeraStation's current status, including name, IP address, workgroup, and hard disk settings.

Notes:

• The Web Admin interface supports Firefox 1.5 or later, Internet Explorer 6.0 with SP2 or later, and Safari 3 or later. It may not display properly in other browsers.

• The Web Admin interface may not display correctly in Internet Explorer due to your browser security settings. If this happens, navigate to [Tools] - [Internet Options] - [Security] on Internet Explorer, and set the Security Settings to [Local intranet].

The Web Admin interface is organized by tabs across the top. The following tabs are available.
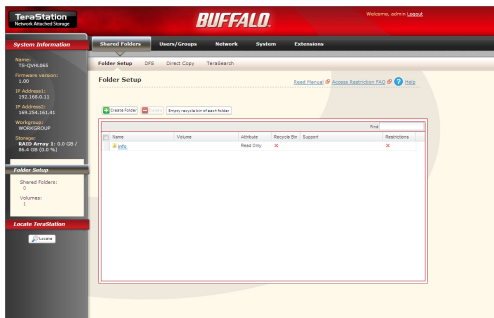
- [Shared Folders]
  Add or delete Shared Folders; configure Access Restrictions, DirectCopy, DFS and TeraSearch.

- [Users/Groups]
  Add, delete, and configure Users and Groups.

- [Network]
  Configure Network, Workgroup, and NFS settings.

- [System]
  Configure Name, Date and Time, RAID setup, RAID Scanning, Check Disk/Format Disk, Backup, Replication, Email Notification, Sleep Timer, UPS Settings, Restore/Erase.

- [Extensions]
  Configure Web Access, Print Server, and Time Machine.

Notes:

• You may also open the Web Admin interface by typing the IP address that you wrote down in step 2 into the address field of your browser. Press the <Enter> key and bookmark this page in your browser so that you can return to it easily.

•With Mac OS X 10.4 or later, you can open the Web Admin interface from within Safari with Bonjour.

1 Launch Safari.

2 Select [View] - [Show Bookmarks Bar] from Safari's menu.

3

Select [Bonjour] from the left-side menu, then click on your TeraStation in the bookmark list.

4
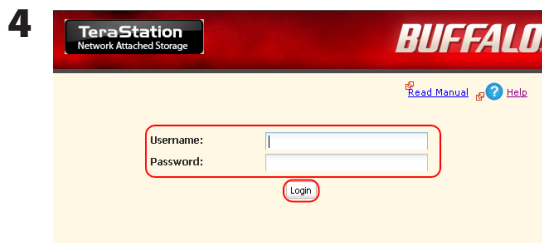
1 Enter your username and password.

2 Click [Login].

Note: To log in as a guest, type "guest" as the username and leave the password blank.

5
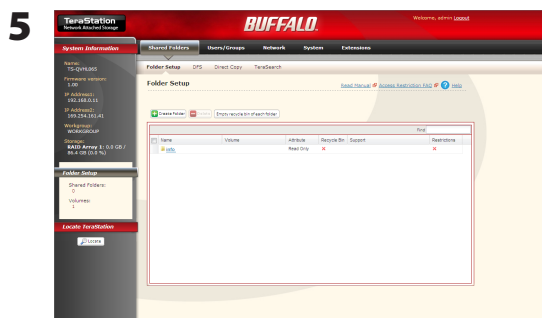
The Web Admin interface opens.

The TeraStation's name, IP address and disk information are displayed on the left.

Chapter 3
Configuring Access Restrictions

TeraStation allows you to set permissions for users or groups to access specific shared folders. Four types of Access Restrictions are available:

• Access Restrictions for Users and/or Groups on the TeraStation
> Follow the procedure on page 23 to configure.

• Access Restrictions on NT Domain
> Follow the procedure on page 25 to configure.

• Access Restrictions on Active Directory
> Follow the procedure on page 27 to configure.
> **Notes:**
> • This chapter describes the procedure to use Active Directory with Windows 2000 Server, Server 2003, and Server 2008.
> • Depending on the security settings, the TeraStation may not be able to join, or may be able to join but may not be authenticated by a domain. In such a case, it is recommended to restrict access by delegating authority.

• Restrict access by delegating authority
> Follow the procedure on page 29 to configure.

Notes:

• Access restrictions on the TeraStation are configured for shared folders in the root folder. Subfolders inherit their permissions from their parent folder and may not be configured separately.

• Permissions on the TeraStation are configured from within the Web Admin interface. Changing TeraStation permissions on the fly from within Windows or OS X is not supported.

Adding a Shared Folder

1
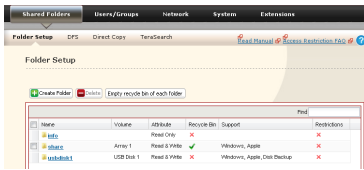
1 In the Web Admin interface, click [Shared Folders] - [Folder Setup].

2 Click [Create Folder].

2
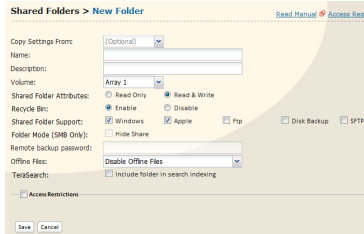
1 Configure the desired settings for the new folder.

2 Click [Save].

Notes:
• Shared folder names can contain up to 27 bytes (UTF-8). Alphanumeric characters, multi-byte characters, -(hyphen), and _(underscore) may be used. Do not use a symbol as the first character.
•Shared folder descriptions can contain up to 75 bytes (UTF-8). Alphanumeric characters, multi-byte characters, -(hyphen), _(underscore), and spaces may be used. Do not use a symbol as the first character.
• You may create up to 400 shared folders on the TeraStation.

You have created a new shared folder.

[Recycle Bin]

Each shared folder on the TeraStation that is connected by SMB may have the recycle bin enabled or disabled from within the Web Admin interface. If enabled, deleted data from a shared folder will be temporarily moved to a [Trashbox] subfolder. To recover deleted data, open the [Trashbox] folder and move files.

Notes: To delete all files in the Recycle Bin, click [Shared Folders] - [Folder Setup] - [Empty recycle bin of each folder] on the Web Admin interface.

[Read Only] Shares

A folder may be configured as read-only by selecting [Read Only] from [Shared Folder Attributes].

Notes: The default setting is [Read & Write].
A shared folder whose attribute is set to [Read Only] is read-only for all users, even if they are assigned write permissions on the share.
When a shared folder is configured to [Read Only], the message "(Read Only)" is added to the description of that share folder.

[Hide Share]

In the Web Admin interface, click [Shared Folders] and select [Hide Share] on [Folder Mode (SMB Only)]. Click [Save].

Only SMB shares may be hidden. If other protocols are checked for the share, such as [Apple], [Ftp], or [SFTP], you cannot select [Hide Share].

To open a hidden share, click [Start] - [Run] and enter \\TeraStation Name\Shared Folder name$\. Example: If your TeraStation is named "TS-XL001" with the default share "share" hidden, enter \\TS-XL001\share$\.

Technical Restrictions

- Windows does not support some characters that OS X and the TeraStation allow. So, if you create a filename on a Mac with any of the following characters, it will not display correctly on a Windows computer. With Mac 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 as a Username or Group Name: root, bin, daemon, sys, adm, tty, disk, lp, sync, shutdown, halt, operator, nobody, mail, news, uucp, ftp, kmem, utmp, shadow, users, nogroup, all, none, hdusers, admin, guest, man, www, sshd, administrator, ftpuser, apache, mysql.

- Do not use any of the following words as a shared folder name: info, spool, usbdisk1, usbdisk2, usbdisk3, usbdisk4, usbdisk5, lost+found, global, printers, homes, lp, auth, ram, disk1, disk2, disk3, disk4, disk5, disk6, disk7, disk8, array1, array2, array3, array4.

- When using multi-byte characters (such as Japanese), make folder and file names with 80 bytes or less. Total pathlength is limited to 1024 bytes. You may not be able to copy a folder or file whose name is more than 80 bytes characters long, or whose pathname is more than 1024 bytes total.

- You cannot set hidden or read-only attributes to folders or files on a TeraStation from Windows. To set an attribute for a share on the TeraStation, use the Web Admin interface. In [Shared Folders] - [Folder Setup], click the shared folder you want to configure. Select [Read Only] or [Read & Write] from [Shared Folder Attributes], and [Hide Share] from [Folder Mode (SMB Only)].

- If local characters aren't displayed properly in a Shared Folder or Workgroup name, use alphabetical character.

- If you access a shared folder from a Macintosh computer, information files for Macintosh may be automatically generated. Do not delete these files from a Windows computer. Otherwise, you may no longer access folders from Macintosh.

- A volume name mounted by [Finder] from Mac OS X 10.3.9 may be corrupted when connected via SMB. File names and data should be fine.

- On Mac OS X 10.5 - 10.5.6, you cannot search by Spotlight while connected via AFP. In such a case, use SMB connection or use Mac OS X 10.5.7 or later.

- TeraStation belongs to the default zone specified by an AppleShare Server. You cannot specify a zone.

- Date and Time stamp information stored on a TeraStation's hard disk or a USB hard disk connected to the TeraStation may be updated by an attached OS, and its accuracy cannot be guaranteed.

- If you display size of hard drives through the Web Admin interface, it will show a larger value than that shown by Windows' drive properties.

- If you change a TeraStation's settings or add a USB hard drive while transferring files, the file transfer may be aborted.

- Copying files to TeraStation is protected by the Journaling File System. However, if power is suddenly disconnected in the middle of a file copy, the following events may occur:

  - Data configured (TeraStation, User or Group names) may be lost.

  - The copied file may be incomplete and it may not be deleted. In such a case, restart TeraStation and delete the file, and try copying the file again.

- Although you format TeraStation's hard disk, [Percent Used] or [Amount Used] in the Web Admin interface will not show 0 (zero). This is because some space is used for the system.

- Set the TeraStation's username and password the same as the user's username and password for logging into the Windows network. If they are different, you may not be able to access share folders with access restrictions.

- Click [Shared Folders] - [Folder Setup] - [Empty recycle bin of each folder] in the Web Admin interface to delete all of the contents of the [Recycle Bin] folder in the shared folder.

- Do not set the same network address for LAN port 1 and LAN port 2, or data transmission may be unstable.

- If you want to access a different network from the TeraStation, use LAN port 1. LAN port 2 cannot access beyond the local subnet as it doesn't have a default gateway.

Examples: You cannot use Mail Notification (cannot find the mail server), or you cannot find a TeraStation by IP address to configure as a backup destination.
To resolve, place the TeraStation on the same subnet as the device that you are trying to connect to via LAN port 2.

Adding Users

1
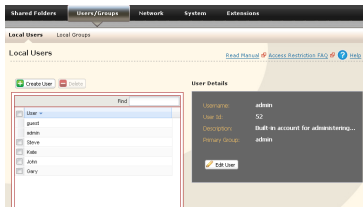
1 Click [Users/Groups] - [Local Users].

2 Click [Create User].

2
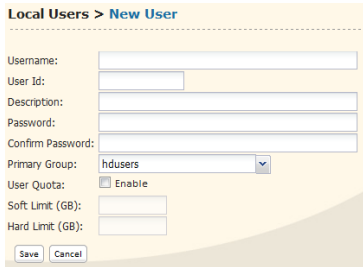
1 Enter [Username], [Description], and [Password].

2 Click [Save].

Notes:

• Usernames can contain up to 20 bytes (UTF-8). Do not use multi-byte characters. Alphanumeric characters, -(hyphen), _(underscore), .(dot), !, #, &, @, $, *, ^, % may be used. Do not use a symbol as the first character.

• User descriptions can contain up to 75 bytes (UTF-8). Alphanumeric characters, multi-byte characters, -(hyphen), _(underscore), and spaces may be used. Do not use a symbol and space as the first character.

• You may register up to 300 local users with the TeraStation.

• Passwords can contain up to 20 bytes (UTF-8). Do not use multi-byte characters. Alphanumeric character and the following characters may be use: - _ @ ! # $ % & ' ( ) * + , . / ; < > = ? [ ] ^ { } | ~   Do not use a symbol except -(hyphen) as the first character.

• Set the TeraStation's username and password the same as the user's username and password for logging into the Windows network. If they are different, the user may not be able to access shared folders with access restrictions.

• Repetitive deletions and additions of users may cause the Quota feature to not work properly. Even though the data is copied by the backup function of the TeraStation, the Quota feature may not work properly if a user ID/group ID is duplicated. In such a case, use a user name/group name of an unused user ID or group ID.

• To assign Quotas for users, check [Enable] for User Quota and enter a limit in GB. Refer to "TeraStation Hard Drive Operating Guide" for details.

• If the user ID is left blank, a user ID will be automatically assigned. When using the Quota feature, use numbers between 1000 and 1999 to set a group ID manually. Make sure that user ID are unique.

Importing Users

To import many users at once, enter the following information in the [Input CSV format data] field on [Users/
Groups] - [Local Users] on the Web Admin interface, and click [Import].

Format of the user information: Username (required), Password (required), and Description (optional)

Example)
username1, password1, description1
username2, password2, description2
username3, password3, description3
…
…
…

Notes: • It may take about 1 hour depending on the number of users you import. Please note that you cannot use
the Web Admin interface while the system is busy.

• Use commas as separators. Do not use spaces before or after the commas.

• If a line is incorrectly formatted, then the user in that line will not be registered.

• If a username is already registered on the TeraStation, that user will be overwritten.

• Commas should not be used in usernames, passwords, or user descriptions

Adding Groups

1
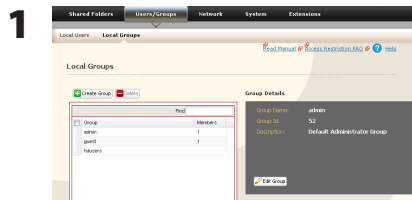
1. Click [Users/Groups] - [Local Groups] in the Web Admin interface.
2. Click [Create Group].

2
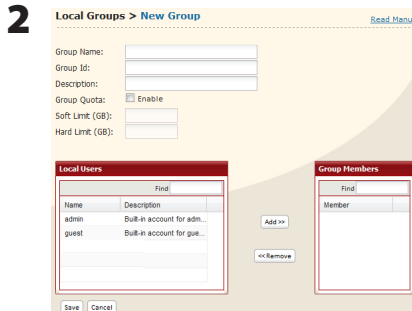
1. Enter [Group Name] and [Description].
2. Select users who join a group, click [Add].
3. Click [Save].

Notes:

• Group names can contain up to 20 bytes (UTF-8). Do not use multi-byte characters. Alphanumeric characters, -(hyphen), _(underscore), and .(dot) may be used. Do not use a symbol as the first character.

• Group descriptions can contain up to 75 bytes (UTF-8). Alphanumeric characters, multi-byte characters, -(hyphen), _(underscore), and spaces may be used. Do not use space as the first character.

• You may register up to 300 groups with the TeraStation.

• Repetitive deletions and additions of groups may cause the quota feature to not work properly. Even though the data is copied by the backup function of the TeraStation, the Quota feature may not work properly if a user ID/group ID is duplicated. In such a case, use a user name/group name of an unused user ID or group ID.

• If the Group ID is left blank, a Group ID will be automatically assigned. When using the Quota feature, use numbers between 1000 and 1999 to set a group ID manually. Make sure that a user ID does not duplicate to other users.

• To set a Quota for a group, check [Enable] for Group Quota, and enter the maximum disk space allotted in GB. Refer to "TeraStation Hard Drive Operating Guide" for details.

Access Restrictions

Setting Access Restrictions for Users/Groups

The TeraStation allows you to specify which groups and users can access specific shared folders.

1   Register Users and Groups to the TeraStation as described in the previous sections.

2

1   In the Web Admin interface, click [Shared Folders] - [Folder Setup].

2   Click the shared folder you want to set Access Restrictions for.

3
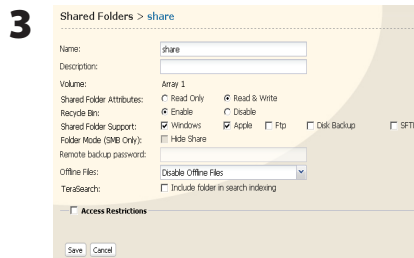
Click [Access Restrictions].

4
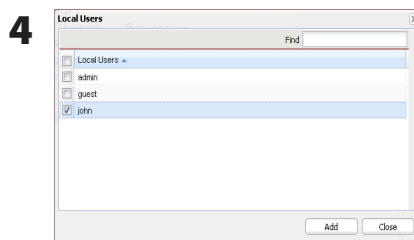
Click [Add].

Note:
The procedure described here shows an example of how to set the access restrictions for local users. To set the access restrictions on Local Groups bases, click [Local Groups] - [Add].

5
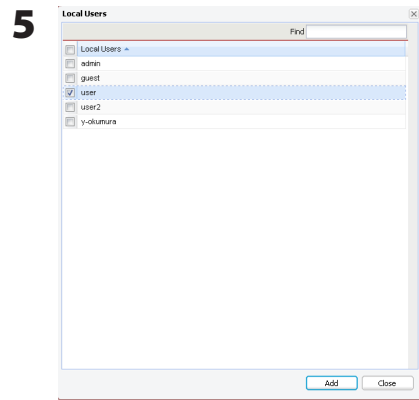
1 Check users or groups that you want to allow to access to the share.

2 Click [Add].

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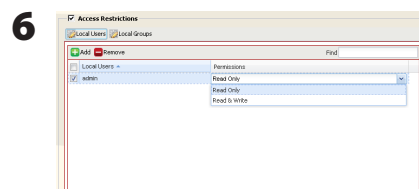
Select the level of privilege for the user or group you added.

7 Click [Save].

You have completed configuring access restrictions.

Notes:

• If you log on from a Microsoft Network Domain, you can set the access restrictions with the user names/group names which are registered on the domain.

• If a specific user is assigned both Read Only and Read & Write, they will have Read Only access. The most restrictive access is always used.

Access Restrictions on NT Domain

The TeraStation can download users, groups, and passwords from an NT Domain server. This procedure is recommended for system administrators only.

1 Create an account on the Domain Controller for the TeraStation.
Note: If there is an option to "Accept accounts for computers with Windows 2000 or earlier", then select it.

2 Click [Network] - [Workgroup/Domain] - [Modify Settings] in the Web Admin interface.

3
1 Select [NT Domain].

2 Enter [NT Domain Name].

3 Enter [NT Domain Controller Name].

4 Enter [Administrator Name].

5 Enter [Administrator Password].

6 Enter [WINS Server IP Address] (Optional)

7 Click [Save].

4 Follow the instructions in the previous section to add access restrictions to the domain.

Notes:

• You can enter up to 23 bytes (UTF-8) for [NT Domain Name]. Alphanumeric characters, multi-byte characters, -(hyphen), _(underscore), and .(dot) may be used. Do not use a symbol as the first character.

• You can enter up to 63 bytes (UTF-8) for [NT Domain Controller Name]. Do not use multi-byte characters. Alphanumeric characters, -(hyphen), and _(underscore) may be used. Do not use a symbol as the first character.

Notes:

- If you change the TeraStation's name, you will no longer be able to use domain users and groups or access restrictions. Rejoin the domain.

- If a domain user name contains more than 20 bytes, the TeraStation truncates it to 20 bytes.

- The TeraStation only downloads the first 1000 users or the first 1000 groups from a domain controller.

- If you operate TeraStation as a member server of an NT Domain or an Active Directory 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. If you need to reflect changes on the domain controller immediately, reboot TeraStation.

- If your TeraStation is a member server in an NT Domain or an Active Directory domain and you change the [Authentication Method] to [Workgroup] in [Network] - [Workgroup/Domain] - [Modify Settings] of the Web Admin interface, the computer account on the domain controller will not be deleted automatically.

- If it has joined a domain network, you cannot connect to the TeraStation via FTP.

- In some environments you may not be able to log in to NT domains. In this case, use an Active Directory domain instead.

Access Restrictions on Active Directory

The TeraStation can download users, groups, and passwords from an Active Directory domain server. This procedure is recommended for system administrators only.

1

1 Click [Network] - [Workgroup/Domain] - [Modify Settings] in the Web Admin interface.

2
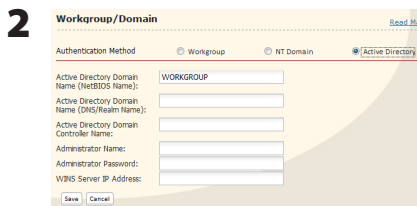
1 Select [Active Directory].

2 Enter [Active Directory Domain Name (NetBIOS Name)].

3 Enter [Active Directory Domain Name (DNS/Realm Name)].

4 Enter [Active Directory Domain Controller Name].

5 Enter [Administrator Name].

6 Enter [Administrator Password].

7 Enter [WINS Server IP Address] (Optional)

8 Click [Save].

3 Follow the instructions on page 23 to 24 to add Access Restrictions to Domain Users/Domain Groups.

You have completed the settings for this feature.

Restrictions When Administrating in Active Directory Domain

- When you have the TeraStation joined to an Active Directory domain, you must specify the DNS Server which can resolve names for Active Directory domain.

- After building an Active Directory domain, the administrator's password which is needed to join the Active Directory domain must be changed at least once, or joining the Active Directory domain will fail.

- Active Directory domain's DNS name and NetBIOS name must be identical.

- If there are more than 5 minutes difference between the TeraStation's clock and the domain controller's clock, joining the domain or authenticating domain users or groups may fail.

Access Restrictions through Delegate Authority to External SMB Server

To permit access to the TeraStation by administrating all user accounts and passwords together using a delegate server, follow procedures below. This is recommended for network administrators only.

Notes:

For Windows 7/Vista, Windows Server 2003/Server 2008 Users

When setting Access Restrictions via Delegate Authority to External SMB Server, you need to change the security setting on Windows 7/Vista and Windows Server 2003/Server 2008.

You can download the File Sharing Security Level Change Tool from www.buffalotech.com.

Select [Start] - [BUFFALO] - [File Security Tool] - [File Security Tool] and select [Change security level] to change the security level (when changing back again, select [Recover default security level]).

During the initial setup, the message, [Change security level. Will you continue?] is displayed. Click [Yes] and follow the instructions on the screen to restart your PC .

Note:

Clicking [Yes] on the message for converting to Local Users which is displayed when applying changing External SMB Server Settings will convert all Local Users registered on the TeraStation to External SMB Server Users. You must set the Local user password again after resetting the External SMB Server.

1
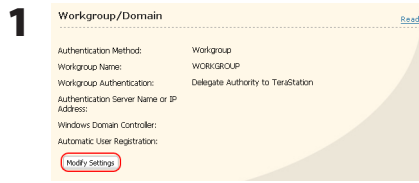
In the Web Admin interface, click [Network] - [Workgroup/Domain] - [Modify Settings].

2
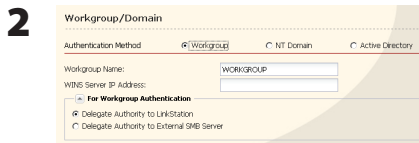
1 Select [Workgroup].

Note: Even if you will use this unit in a domain environment, select [Workgroup].

2 Select [Delegate Authority to External SMB Server].

3
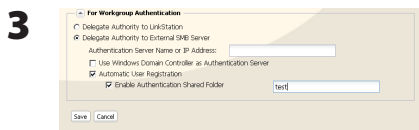
1 Click [Automatic User Registration]. Check [Enable Authentication Shared Folder]. If using Windows Domain Controller, check [Use Windows Domain Controller as Authentication Server].

2 Enter [Authentication Server Name or IP Address].

Note:

If you will be connecting using AFP and FTP, entering an IP address for the authentication server is recommended.

3 Enter an Authentication Share Folder Name in [Enable Authentication Shared Folder] field.

4 Click [Save].

Notes:

• Match the Workgroup name of this product and the Windows domain controller's domain name if you would like to specify the Windows domain controller as an external authentication server.

• You can enter up to 23 bytes (UTF-8) for [Workgroup Name]. Alphanumeric characters, multi-byte characters, hyphens (-), underscores (_), and periods (.) may be used. Do not use a symbol as the first character.

4 An Authentication Shared Folder is created on the TeraStation.
When a user who is registered to the specified External Server opens the Authentication Shared Folder, he/she will be automatically registered as a TeraStation user (you can directly register users).

Notes:
- A user who is automatically registered will belong to the "hdusers" group. They can be set to belong to any group from the Group settings.
- Access Restrictions to shared folders can be set for the User Name obtained
- User Name registered will be displayed when clicking [Users/Groups] - [External Users]. To delete a user that automatically registered, select the user and click [Delete External Users].
- When connecting using AFP and FTP, always use an IP address. Authentication may fail if a Server Name is used.
- Enter the IP address when specifying a server in a different subnet.
- AFP and FTP connections do not allow obtaining user information by delegating authority to External SMB Server.

5 Follow the instructions on pages 23 and 24 to add access restrictions to External Users/Groups.

You have completed the settings for the Authentication Server.

Restrictions When Administrating Delegate Authority Option

- If you cannot access the TeraStation while logged into Windows using the account information registered to the authentication server, you cannot access shared folders on the TeraStation or set access restrictions.
- If you use the Delegate Authority option, you cannot connect as a guest user via AFP.
- If you use the Delegate Authority option, you cannot connect as a Anonymous user via FTP.

Chapter 4
Managing your TeraStation

Name, Date and Time

Configure the TeraStation's host name, date, or time as follows:

1

In the Web Admin interface, navigate to [Modify Settings] in [System] - [Settings] - [Name].

2
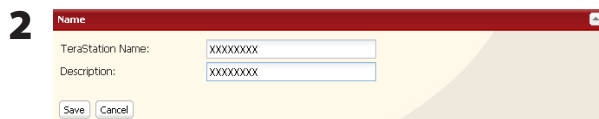
1 Enter [TeraStation Name] and [Description].

2 Click [Save].

3

In the Web Admin interface, navigate to [Modify Settings] in [System] - [Settings] - [Date and Time].

4
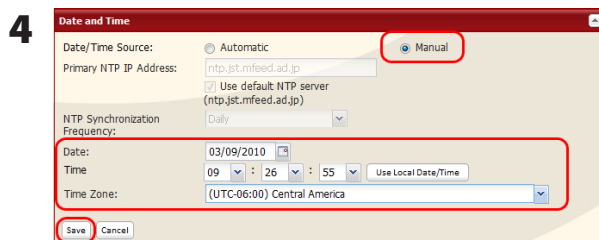
1 Select [Date] and [Time].

2 Click [Save].

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 an NTP server.

NTP
NTP may not be usable in some networks.
The default NTP Server (ntp.jst.mfeed.ad.jp) belongs to Internet Multi Feed Inc. For more information, please visit www.jst.mfeed.ad.jp.
Use NTP at your own risk. Buffalo Technology is not responsible for any loss or damage caused by using this service, stopping the service, or missing service.

You've completed hostname and time settings for the TeraStation.

Note:

The TeraStation's internal clock may run at a slightly different speed from other clocks on you network, and over a long period of time your network devices may show different times. 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.

E-mail Notification

Your TeraStation can send you daily e-mail reports. It can also send you an e-mail when settings are changed or an error occurs.

The following contents will be sent via E-mail.

- Sends the status of hard drives at specified time
- Changes to RAID configuration
- Fan error alert
- Hard drive replacement alert

- Notifies when backup jobs are completed
- RAID error alert
- Hard drive read error alert
- Notification of Quota changes or limits

1
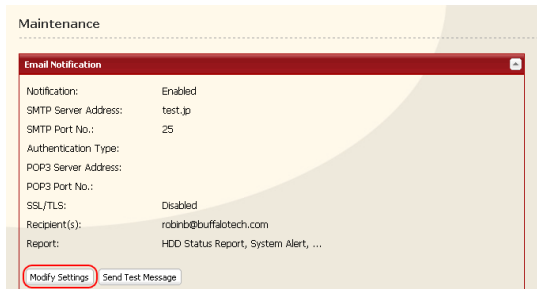
In the Web Admin interface, navigate to [System] - [Maintenance].

2 Click [Modify Settings] in [Email Notification].

3
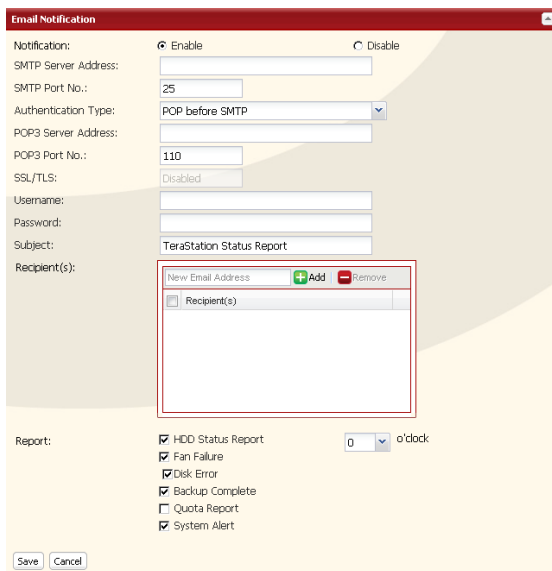
1 Click [Enable] under [Notification].

2 Type [SMTP Server Address] and [SMTP Port No.].

Note:

If using [POP before SMTP], enter [POP3 Server Address] and [POP3 Port No.].

3 Select [Authentication Type] from [Disabled], [POP before SMTP], [LOGIN(SMTP-AUTH)], or [CRAM-MD5(SMTP-AUTH / CRAM-MD5)].

4 Enter [Username].

5 Enter [Password].

6 To use a secured connection, select [SSL] or [TLS].

7 Enter [Subject] for notification e-mail.

8 Enter an e-mail address in [New Email Address] field, then click [Add] . E-mails can be sent to up to 5 addresses.

9 Select conditions for e-mails to be sent.
- [HDD Status Report]   Sends the condition of the hard drives at the specified time.
- [Fan Failure]   Sends when the fan error is recognized.
- [Disk Error]   Sends when an hard drive error is recognized
- [Backup Complete]   Sends when the backup is complete.
- [Quota Report]   Sends when the Quota Space Limitation is exceeded at the time which is specified on HDD Status Report.
- [System Alert]   Sends when system is rebooted or shut down, or RAID configuration is changed.

10 If you have selected [HDD Status Report] for sending condition, select time to send.

11 Click [Save].

4

Email Notification	
Notification:	Enabled
SMTP Server Address:	test.jp
SMTP Port No.:	25
Authentication Type:	
POP3 Server Address:	
POP3 Port No.:	
SSL/TLS:	Disabled
Recipient(s):	robinb@buffalotech.com
Report:	HDD Status Report, System Alert, ...

Modify Settings   Send Test Message

Click [Send Test Message] to send a test message.

Notes:

The following examples show notification emails for each selection:

• The content of the mail which include the periodical report when [HDD Status Report] is selected
TeraStation Status Report: Periodical Report: Information
[TeraStation Information]
TeraStation Name: TS-xxxxx
Time Stamp: 2009/03/23 00:00:01
IP Address: 172.16.37.62
Configuration Scree: http://172.16.37.62/
Continuous operating time: 13:51:57

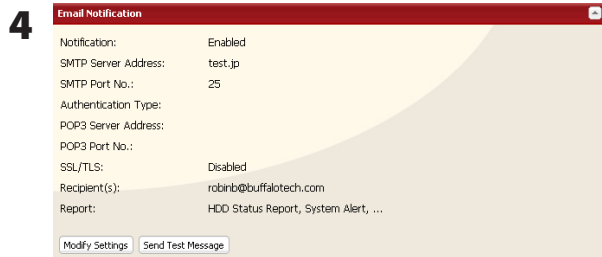• The content of mail which is sent periodically when [Disk Error] is selected
TeraStation Status Report: DISK Error Notification: Failure: Fail to mount a disk
DISK Error Notification
The error occurred on HDD.
The erroneous disk drive: Disk 1
Disk could not be mounted.

• The content of mail which is sent periodically when [Fan Failure] is selected
TeraStation Status Report: FAN Error Notification: Failure: FAN stopped.
FAN Error Notification
The FAN has stopped.
The internal temperature is now over the threshold. Shut down the system.
System temperature: 52 [°C]

UPS Settings

An UPS (Uninterruptible Power Supply) can protect the TeraStation from power outages and brownouts. To use the TeraStation with a UPS, proceed as follows:

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

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

3 Connect the UPS to the TeraStation with a USB or serial connection.
Note:
When using the USB cable, connect to the USB port on the rear. When using the dedicated cable, connect to the dedicated UPS port on the rear.

4 Turn on the UPS, then the TeraStation.

5 In the Web Admin interface, click [System] - [Power Management] - [UPS Settings].

6 Click [Modify Settings].

7
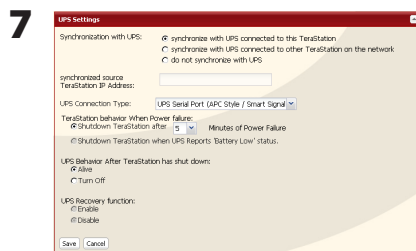
1 Configure the desired settings.
If your TeraStation is connected directly to the UPS, select [synchronize with UPS connected to this TeraStation]. To have the UPS shut down multiple TeraStations on the same network, select [synchronize with UPS connected to other TeraStation on the network] and enter the IP address of the TeraStation that is connected directly to the UPS in the field below.

2 Click [Save].

3 Reboot your TeraStation.
The settings are applied after the TeraStation is restarted.

Notes:
- If the UPS has shut down the TeraStation because of a power outage, make sure that power has been restored before restarting the TeraStation. If the TeraStation is restarted after a shutdown, but power is not available, then the UPS will not shut down the TeraStation a second time even if its battery is running low.
- If UPS recovery is enabled, the TeraStation will automatically restart when normal power is restored.

Beep Alerts

You can set the TeraStation to beep when certain errors occur.

1 In the Web Admin interface, select [System] - [Maintenance] - [Alert Sound Settings] - [Modify Settings].

2

1 Select the conditions to beep the alert from [Overheating], [Disk Error], [Fan Error], or [UPS power Error].

2 Click [Save].

You've now configured alerts.

LCD Display Settings

You may configure the LEDs and LCD screen on the front of the TeraStation here.

1 In the Web Admin interface, select [System] - [Maintenance] - [Front Panel Settings].   Click [Modify Settings].

2
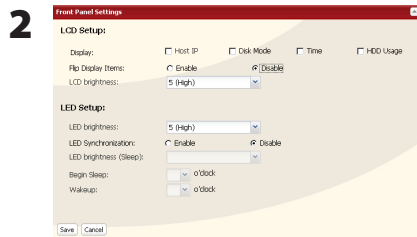
1 Configure the desired settings for [LCD Setup] and [LED Setup].

2 Click [Save].

You have completed the settings for the display panel.

Changing the Admin Username and Password

1
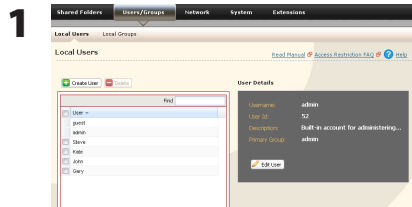
In the Web Admin interface, select [Users/Groups] - [Local Users].

2
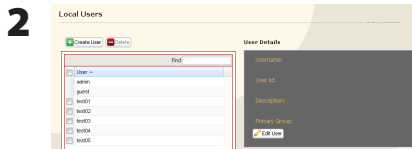
1 Click [admin] from the user list.

2 Click [Edit User].

3
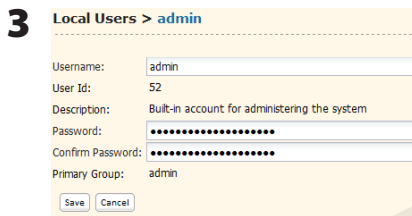
1 Enter [Username] and [Password].

2 Click [Save].

You've now changed the admin password.

Notes:

• Usernames can contain up to 20 bytes (UTF-8). Do not use multi-byte characters. Alphanumeric characters, -(hyphen), _(underscore), .(dot), !, #, &, @, $, *, ^, % may be used. Do not use a symbol as the first character.

• Passwords can contain up to 20 bytes (UTF-8). Do not use multi-byte characters. Alphanumeric character and the following characters may be use: - _ @ ! # $ % & ' ( ) * + , . / ; < > = ? [ ] ^ { } | ~   Do not use a symbol except -(hyphen) as the first character.

• You cannot assign access restrictions to the "admin" account, or use it for WebAccess.

Erase Data on the TeraStation Completely

Data on the hard drive is not completely erased by just performing "Delete" or "Format". If you want to completely delete data from a TeraStation that you are going to donate, give away, or send in for repairs, do the following.

1 In the Web Admin interface, select [System] - [Restore/Erase] - [Erase].

2 Click [Erase].

3 The [Confirm Operation] screen will appear. Enter the number from the [Confirmation Number] field within 60 seconds, then click [Apply].

4 Follow the instructions displayed on the screen.

Notes: This will erase all data on the TeraStation and replace it with zeros. When the process is complete, the TeraStation will be configured as follows:

        Hard drives in Normal mode
        Shared folders on each drive.
        All settings to factory defaults
        Logs: All deleted
        Data: All deleted

If you remove a drive and then erase all data on the TeraStation, the LCD display will show the error "HDx Error E22 HDx Can't Mount" where x is the hard drive you removed. You can still use the TeraStation.

Initialization

Initialization from within the Web Amin interface

In the Web Admin interface, you can initialize the following settings.

TeraStation Name, Description, NTP Settings, Workgroup Settings, Network Services, File Sharing Settings, Shared Folders Settings, USB Disk Settings, RAID Scanning, Sleep Timer, Restrictions on Shared Folders, User Settings, User/Group, Notification Settings, Synchronization with UPS, Backup Settings, Admin username and password, Network Settings (IP Address, Subnet Mask and etc.), Time Machine, Web Access, DFS, DirectCopy, NFS, TeraSearch, Alert Sound Settings, Front Panel Settings, RAID Array Failure Settings, Language, Syslog, PrintServer, Web Server, MySQL Server

1 In the Web Admin interface, navigate to [System] - [Restore/Erase]- [Restore Factory Defaults].

2 Click [Restore TeraStation].

3 The [Confirm Operation] screen will open. Enter the number from the [Confirmation Number] field within 60 seconds, then click [Apply].

4 Follow the instructions displayed on the screen.

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. To change the TeraStation's IP address settings, your computer should be connected to the same router (subnet) as the TeraStation and should be running NAS Navigator2 (included on your TeraNavigator CD).

1 For a PC, double-click the [NAS Navigator2] icon on your Desktop.   For a Mac, click the [NAS Navigator2] icon in the Doc. NAS Navigator2 will launch.

2 For a PC, right-click your TeraStation and choose [Properties]. Select [IP Settings]. For a Mac, hold the control key and click your TeraStation's icon, then choose [Configure] - [IP Address].
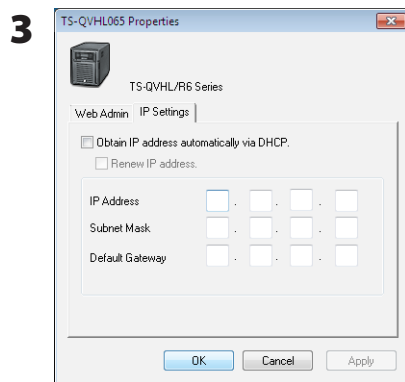
3 Uncheck [Obtain IP address automatically via DHCP.]. Enter the desired [IP Address] and [Subnet Mask]. Click [OK], or [Apply] if you're using a Mac.

You've configured a static IP address for the TeraStation. To return to using DHCP, reopen the Network Properties screen and recheck [Obtain IP address automatically via DHCP].

Network

Jumbo Frame

If your other network devices support it, you may be able to increase network performance with Jumbo Frame.

1

Ethernet Frame Size	
Ethernet 1 Frame Size:	1,518 bytes(Default)
Ethernet 2 Frame Size:	1,518 bytes(Default)
Modify Settings	

1 In the Web Admin interface, navigate to [Network] - [Settings]

2 Click [Modify Settings] in [Ethernet Frame Size].

2

Ethernet Frame Size	
Ethernet 1 Frame Size:	1,518 bytes(Default)
Ethernet 2 Frame Size:	1,518 bytes(Default)
Save Cancel	
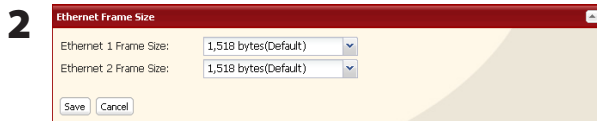
1 Select [Ethernet Frame Size].

2 Click [Save].

3

Connection	Transmission
TeraStation — Jumbo Frame (4102/7422/9694) — Jumbo Frame Supported — Jumbo Frame Supported	○ Transmit Jumbo Frame (4102/7422/9694)
TeraStation — Jumbo Frame (4102/7422/9694) — Jumbo Frame Supported — Jumbo Frame Not Supported	△ Transmit normally(1518)
TeraStation — Jumbo Frame (4102/7422/9694) — Jumbo Frame Not Supported — Jumbo Frame Not Supported	△ Transmit normally(1518)
TeraStation — Jumbo Frame (4102/7422/9694) — Jumbo Frame Not Supported — Jumbo Frame Supported	✕ No transmission

Notes:

- To benefit from using jumbo frames with the TeraStation, your router/switch/hub should support jumbo frames.
- To use jumbo frames (4102/7422/9694 bytes), your computer's NICs and all switches, hubs, and routers on the transmission route need to support jumbo frames. If any device on the route doesn't support jumbo frames, use standard transmission (1518 bytes) instead.
- If you are using jumbo frames and back up data from a LinkStation/TeraStation to another LinkStation/TeraStation, set the Ethernet frame sizes of the LinkStations/TeraStations to the same settings (or the closest available). If the Ethernet frame sizes are significantly different, the backup job may fail. If you have problems with backup jobs, select the default frame size (1518 bytes).

Port Trunking

You may use two separate LAN connections for redundancy, speed, and reliability.

Note:

To use Port Trunking, your hub or switch must support it.

The following Port Trunking modes are available:

[Off]: Port trunking is not used.
[Round-robin policy] (*1):
   Sets a round-robin policy for fault tolerance and load balancing.
[Active-backup policy]:
   Sets an active-backup policy for fault tolerance.
[XOR policy] (*1) :
   Sets an XOR (exclusive-or) policy for fault tolerance and load balancing.
[Broadcast policy]:
   Sets a broadcast policy for fault tolerance.
[Dynamic link aggregation] (*2):
   Sets an IEEE 802.3ad dynamic link aggregation policy.
[Adaptive transmit load balancing (TLB)]:
   Sets a Transmit Load Balancing (TLB) policy for fault tolerance and load balancing

*1   Your switch must support this. Configure the two ports on the switch in advance. Refer to your switch's manual for instructions on configuring it.
*2   Your switch must support this. Enable LACP (Link Aggregation Control Protocol) in the switch in advance. Refer to your switch's manual for instructions on configuring it.

Important:

After configuring [Port Trunking] in the Web Admin interface, reboot the TeraStation by holding down the power button until it shuts down, then restarting it.

To configure port trunking,

1 Connect LAN port 1 on the TeraStation to a port on the switch. Do not connect LAN port 2 yet.

2 In the Web Admin interface, navigate to [Network] - [Settings] - [Port Trunking].

3 Under [Port Trunking], click on [Modify Settings].

4 Connect LAN port 2 on the TeraStation to the switch.

5 Hold down the TeraStation's power button for 3 seconds to turn it off. Press it again to restart the TeraStation.

Port Trunking is now configured.

Online Update

When the latest firmware is released, an update can be performed to the latest firmware from the Web Admin interface. Use the procedure below to check the firmware update history and perform the update.

1
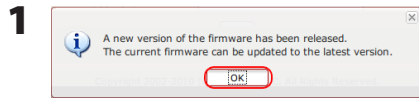
1 When the latest firmware is released, the message "A new version of the firmware has been released. The current firmware can be updated to the latest version." is displayed on the TeraStation's Web Admin interface.

2 Click [OK].

2 In the Web Admin interface, navigate to [System] - [Maintenance] - [Firmware Installation].

3
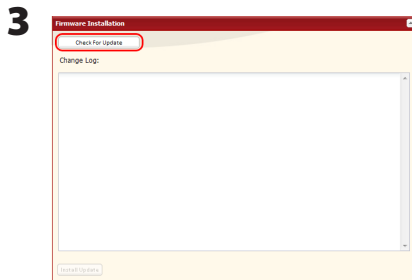
1 Click [Check For Update] to check the change log.

2 Click [Install Update] to update firmware.

4 The [Confirm Operation] screen will appear. Enter the number shown in the [Confirmation Number] field within 60 seconds and click [Apply].

The TeraStation will reboot automatically after the firmware update have completed.

You have now configured Online Firmware Installation.

Chapter 5
Extensions

Using WebAccess

What is WebAccess ?

WebAccess lets you access files on your TeraStation through the Internet. Access restrictions can be set for folders that are shared, and automatic router settings by UPnP and redirect functionality from the buffalonas.com server (similar to Dynamic DNS) make configuration easy.
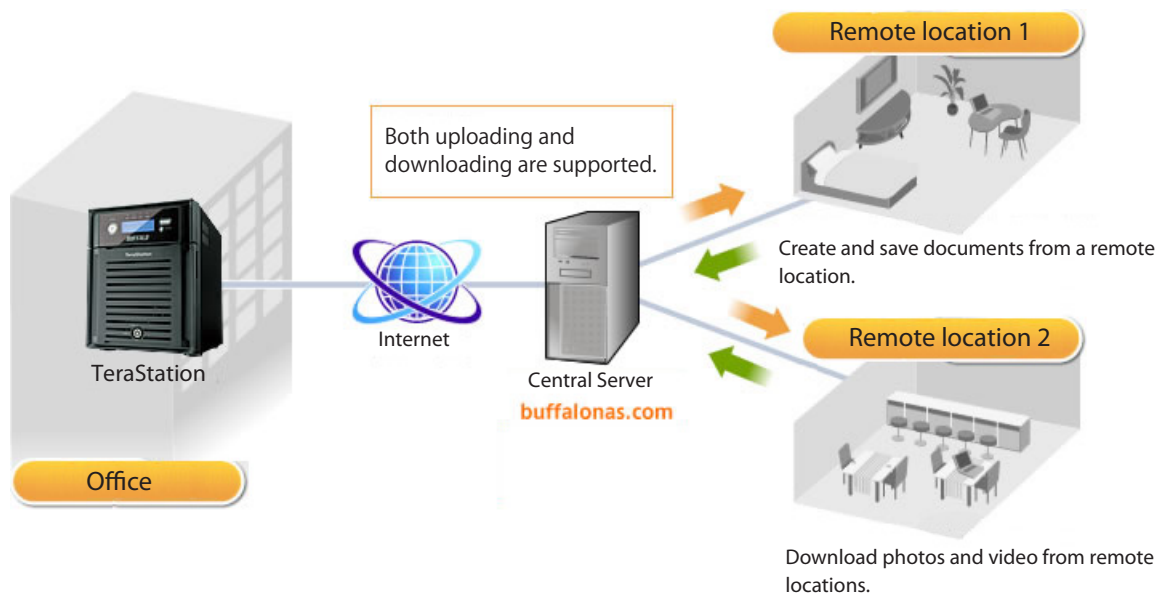
Note:

Care should be taken with configuration of WebAccess. Certain settings can make the files in the shared folder available to anyone on the Internet without any access restrictions.

For more information on WebAccess, visit http://buffalonas.com/manual/en/

PrintServer

TeraStation is equipped with USB ports on the back. You can connect a USB printer to the TeraStation

Refer to "Diagrams and Layout" for the position of the USB ports.

Notes:
• Only one printer can be connected to the TeraStation.
• The TeraStation does not support 2-way communication. For example, it cannot tell you the amount of ink left.
• Multi-function printers are not supported.
• Printers which only support 2-way communication or WPS (Windows Printing System) are not supported.
• Mac OS X cannot print to a printer connected to the TeraStation.

Setting up a printer on Windows 7/Vista

1 In the Web Admin interface, navigate to [Extensions] - [PrintServer] and click [Modify Settings].

2 Select [Enable] and click [Save].

3 Refer to your printer's manual installation instructions. You may need to install the printer driver from a software disk.

4 Click [Start] - [Network].

5 Double-click on the TeraStation's server name.

6

Double-click on the TeraStation's printer icon ("LP").

7

Click [OK].

8

1 Select your printer. Choose the manufacturer on the left and the model on the right. If your printer is not listed, click [Have Disk] and follow the printer manufacturer's directions for installation.

2 Click [OK].

You have added a printer.

Setting up a printer on Windows XP

1

In the Web Admin interface, navigate to [Extensions] - [PrintServer] and click [Modify Settings].
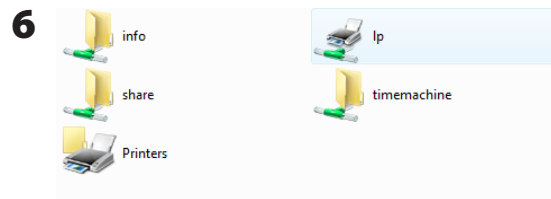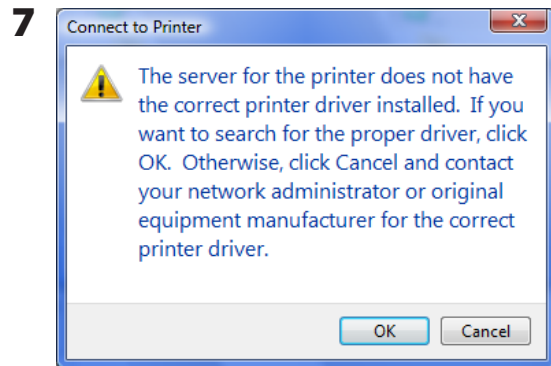
2

1 Choose [Enable] and click [Save].

3 Refer to your printer's manual installation instructions. You may need to install the printer driver from a software disk.
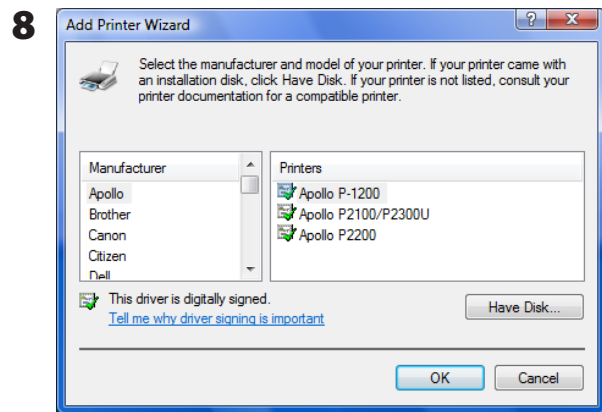
4 Click [Start] - [Control Panel].

5 Click [Network and Internet Connections] icon.

6 Double-click on [My Network Places] - [View workgroup computers] - (Name of the TeraStation Server name) in this order.

7
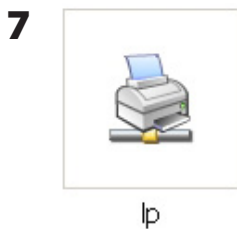
Double-click on the TeraStation's printer icon ("lp").

8 If "The printer driver to your computer will be automatically installed. (...) Would you like to continue?" is displayed, click [Yes].
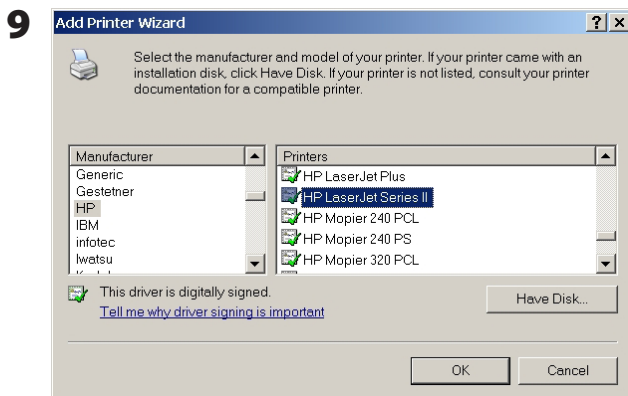
9

1 Select your printer. Choose the manufacturer on the left and the model on the right. If your printer is not listed, click [Have Disk] and follow the printer manufacturer's directions for installation.

2 Click [OK].

You have added a printer.

Setting up a printer on Windows 2000

1

PrintServer

PrintServer
PrintServer: Enabled
[Modify Settings] [Delete Print Queue]

In the Web Admin interface, navigate to [Extensions] - [PrintServer] and click [Modify Settings]..

2

PrintServer
PrintServer: ⊙ Enable ○ Disable
[Save] [Cancel]

1 Click [Enable].

2 Click [Save].

3 Refer to your printer's manual to install the printer driver.

4 Double-click [My Network Places (*)] -[Entire Network] - (the TeraStation Server Name).
* On Windows NT 4.0 this is [Network].

5 Double-click on the TeraStation's printer icon ("lp").

6

Connect to Printer
The server for the printer does not have the correct printer driver installed. If you want to search for the proper driver, click OK. Otherwise, click Cancel and contact your network administrator or original equipment manufacturer for the correct printer driver.
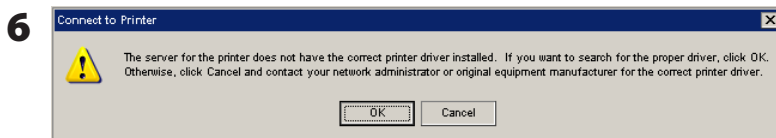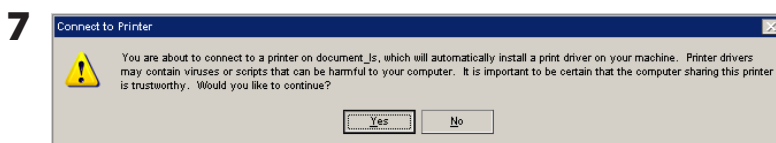[OK] [Cancel]

Click [OK].

7

Connect to Printer
You are about to connect to a printer on document_ls, which will automatically install a print driver on your machine. Printer drivers may contain viruses or scripts that can be harmful to your computer. It is important to be certain that the computer sharing this printer is trustworthy. Would you like to continue?
[Yes] [No]

Click [Yes].

8

Add Printer Wizard
Select the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.

Manufacturer | Printers
Generic | HP LaserJet Plus
Gestetner | HP LaserJet Series II
HP | HP Mopier 240 PCL
IBM | HP Mopier 240 PS
infotec | HP Mopier 320 PCL
Iwatsu |

This driver is digitally signed.
Tell me why driver signing is important

[Have Disk...]

[OK] [Cancel]

1 Select your printer. Choose the manufacturer on the left and the model on the right. If your printer is not listed, click [Have Disk] and follow the printer manufacturer's directions for installation.

2 Click [OK].

You have added a printer.

Sleep Timer

Sleep Timer will automatically turn your TeraStation on and off at specific times to save energy. In Sleep mode, the TeraStation's hard drives, display panel, and LED lights are turned off.
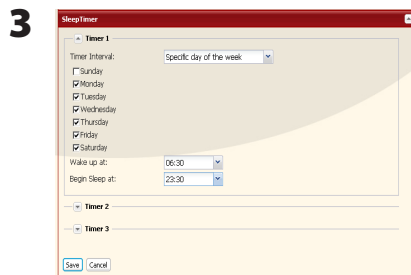
1 In the Web Admin interface, navigate to [System] - [Power Management] - [Sleep Timer].

2 Click [Modify Settings].

3

Specify [Timer Interval], [Wake up at], and [Begin Sleep at]. You can set up to 3 timers. [Wake up at] times may be set from 0:00 to 23:45. [Begin Sleep at] times may be set from 0:00 to 27:45. If [Begin Sleep at] is set to 24:00 or later, then [Wake up at] can be set from 4:00 to 23:45. 24:00 is equivalent to 0:00 of the next day, and 27:00 is equivalent to 3:00 of the next day. [Wake up at] times should be earlier in the day than [Begin Sleep at] times. Do not set the same time for both [Wake up at] and [Begin Sleep at].

Click [Save] when done.

Notes:

•To exit sleep mode, hold in the power button on the TeraStation for about 3 seconds. The unit will power on.

•The TeraStation will not go into sleep mode while performing Check Disk, Disk Format, or Backup, or if a backup is scheduled within 5 minutes of the current time.

•If multiple sleep timers conflict, the longest interval time is used. Here are some examples of multiple timers:

      (e.g.1) It is at 10:00 Wednesday with the TeraStation powered on:

     Timer 1   [Everyday]   12:00 - 24:00

     Timer 2   [Disable]

     Timer 3   [Disable]

      -> Nothing happens at 12:00 and the unit enters sleep mode at 24:00

    (e.g.2) It is at 10:00 Wednesday with the TeraStation powered on:

     Timer 1   [Everyday]   9:00 - 18:00

     Timer 2   [Specific day of the week] - [Wednesday]   10:00 - 20:00

     Timer 3   [Disable]

      -> Except on Wednesdays, the unit powers on at 9:00 and moves to sleep mode at 18:00.

      -> On Wednesdays, it enters sleep mode at 20:00.

    (e.g.3) It is at 10:00 Wednesday with the TeraStation powered on:

    Timer 1   [Everyday]   9:00 - 18:00

    Timer 2   [Specific day of the week] - [Wednesday]   10:00 - 25:00

    Timer 3   [Disable]

    -> Except on Wednesdays, the unit powers on at 9:00 and moves to sleep mode at 18:00.

    -> On Wednesdays, it enters sleep mode at 1:00 of the next day.

    (e.g.4) It is at 10:00 Wednesday with the TeraStation powered on:

    Timer 1   [Everyday]   9:00 - 18:00

    Timer 2   [Specific day of the week] - [Wednesday]   07:30 - 22:00

    Timer 3   [Disable]

    ->Except on Wednesdays, the unit powers on at 9:00 and enters sleep mode at 18:00.

    -> On Wednesdays, the unit powers on at 7:30 and enters sleep mode at 22:00.
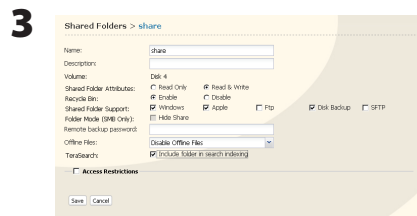
TeraSearch

Enable TeraSearch to allow text searches for strings (such as from a text file or data) on the TeraStation.

1 In the Web Admin interface, select [Shared Folders] - [Folder Setup].
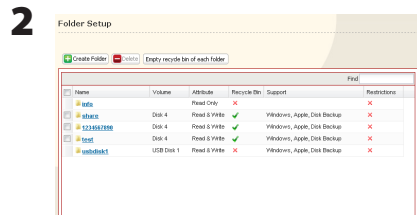
2 Click the shared folder to create an index for.

3

    1 Click [Include folder in search indexing] for [TeraSearch].

    2 Click [Save].

4 Click [Shared Folders] - [TeraSearch] on the Web Admin interface.

5 Click [Modify Settings].

6 Select [Enable], and click [Save].

    Note:
    If you want to update the index regularly, click [Modify Settings] and specify a Time to update the index for [Update Index at].

7 Click [Update Index].

8 Open and display the following URL in an Internet browser.
http://(IP address of TeraStation) :3000/

    Tip: You can get the IP address of your TeraStation from its front panel LCD display, or from NAS Navigator2.

9 Enter a username and password from an account on the TeraStation and click [Login]. For example, the guest account, with blank password, will work.

10 Enter a keyword to search for. If you check [Enhanced Search], you can also specify filename, owner, update date/time, and size to search for.

11 Click [Search].

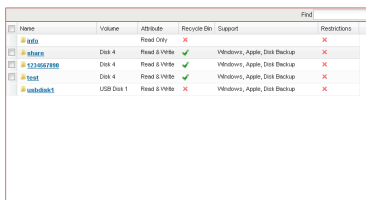Your search results are now displayed.

Offline Files

Your PC can access files from the TeraStation even when it's not connected to the network if Offline Files are enabled. Offline Files are updated and saved on the computer when it's online. Offline Files work with Windows 2000, Windows XP Professional, Vista, and Windows 7. Windows Me and XP Home Edition are not supported.

Configure your PC to use files offline as follows:

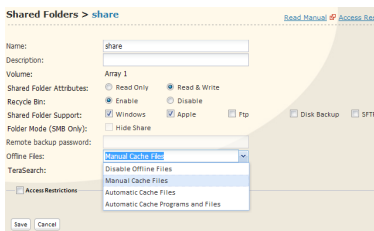**1** In the Web Admin interface, select [Shared Folders] - [Folder Setup].

2

Select a folder to be available offline. Double-click on the folder's name.

3

From the [Offline Files] dropdown, select [Manual Cache Files], [Automatic Cache Files] or [Automatic Cache Programs and Files].

[Manual Cache Files] - Manually select the files to be available offline.

[Automatic Cache Files] - Opened files are cached locally and may be used offline. Old files that cannot be synchronized will be deleted automatically and replaced by new ones.

[Automatic Cache Programs and Files] - Opened files are cached locally and may be used offline. Old files and network applications that cannot be synchronized will be deleted automatically and replaced with new ones.

If you're running Windows 7, skip steps 4 & 5 and move to step 6.

To check if Offline Files are enabled, follow the instruction below.

1 Open the Windows folder, press [Alt] on the keyboard, and select [Tool] - [Open Sync Center] from the popup menu.

2 Click [Manage offline files] on the left side of the [Sync Center] screen.

3 If you see [Offline Files is enabled] on the [General] tab, Offline Files are enabled.
Click [Disable offline files] to disable Offline Files.
If Offline Files are disabled, click [Enable offline files] to enable them.

4 Open Windows folder. Select [Folder Options] from the [Tool] menu.
Note:
Select [Control Panel] - [Folder Options] in Windows 2000 Server.

5
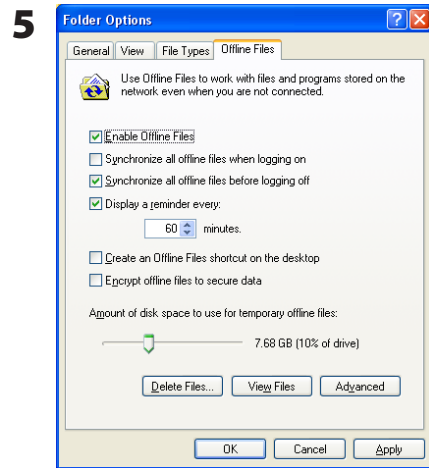
1 Click [Offline Files] tab.

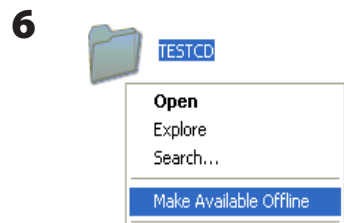**2** Click [Enable Offline Files].

3 Click [OK].

Note:
If [Fast User Switching] in Windows XP is enabled, the screen above will not be displayed. In such a case, open [User Accounts] in the [Control Panel] and uncheck [Use Fast User Switching].

6

1 Right-click on the icon of the shared folder on the TeraStation you have set the offline feature for.

**2** Click [Make Available Offline].

7 When the Offline File Wizard opens, follow the instructions on the screen to configure. For more information, refer to the Windows Help File.

8 After configuration, your offline files and folders display as below (from Windows XP).

9 After the synchronization is complete, you can open offline files even after disconnecting from the network that the TeraStation is on. Offline files can be accessed through the UNC to the original location.
Note: If offline files are available, the icon is displayed in the systray.
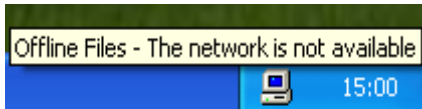
* Editing Offline Files
Offline files can be edited or deleted just like regular files. Differences between data in different locations will be resolved by re-synchronization when the network connection is re-established.

* Synchronizing Offline Files
Offline files are automatically synchronized when you log on or off the network.

* Version Conflicts
Conflicts occur when the offline and original files are both modified differently before they are re-synchronized. If conflicts occur, the following wizard opens. Step through the wizard to resolve the conflicts.
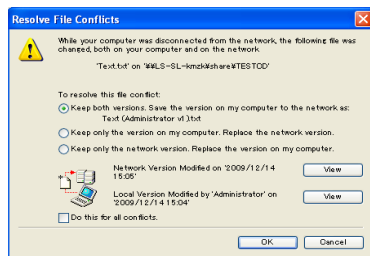
You've configured offline files.

DFS (Distributed File System)

Distributed File System (or DFS) combines shares on the network server together into one tree.

In the following example, when the client computer addresses //tera/share/backup, it's actually looking at files located at //pc_srv/backup. This is transparent to the user 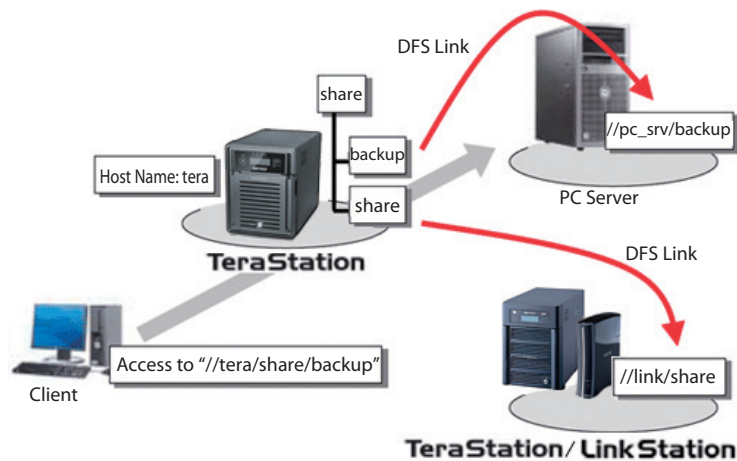of the client computer. If the TeraStation is configured to address multiple DFS shares, then shares on other devices could be addressed as native shares on the TeraStation. For example, //tera/share/share might actually address data located at //link/share.

Notes:

• Buffalo does not support using DFS with Mac OS X.

• Windows 2000 and Windows Server 2003 cannot properly address DFS link destinations that have access restrictions on one or more folders.

• DFS only works with SMB connections. AFP and FTP connections are not supported.

• Access restrictions configured on DFS link destinations are applied to the shared folder link. Access restrictions on the DFS root or DFS links are not visible.

Set up DFS as described below:

1 In the Web Admin interface, select [Shared Folders] - [DFS].

2 Under [DFS Service], click [Modify Settings].

3
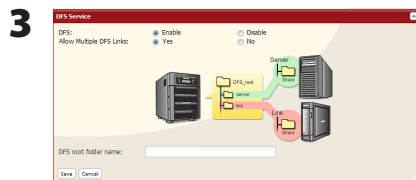
1 Click [Enable].

2 Choose whether to allow multiple DFS links, or just one.

[No] allows just one DFS link to be addressed.

[Yes] allows up to 8 DFS link destinations to be used.

3 Enter the [DFS root folder name].

4 Click [Save].
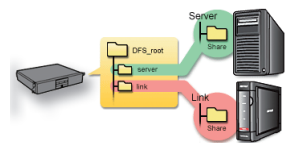
4 Under [DFS Links], click [Add Link].

5

1 Enter [Link Name], [Destination Hostname], and [Destination Folder].
Notes:
The following machines can be DFS link destinations:
• TeraStations
• Windows PC with SMB (Mac OS and Linux are not supported)

2 Click [Save].

DFS has been configured.

FTP Server

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 to access the TeraStation from outside of the local network. You may enable it as follows.

1
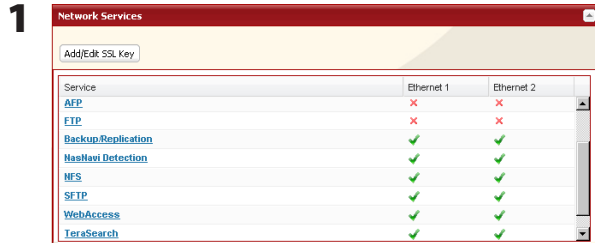
In the Web Admin interface, navigate to [Network] - [Settings] - [Network Services] and click [FTP].

2
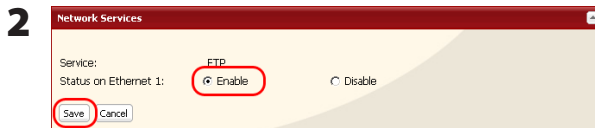
1 Select [Enable].

2 Click [Save].

3 Click [Shared Folders] - [Folder Setup].

4
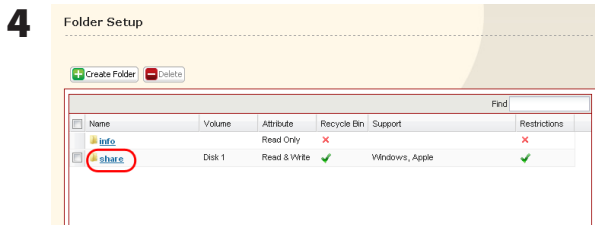
Click the folder to enable remote FTP access on.

5
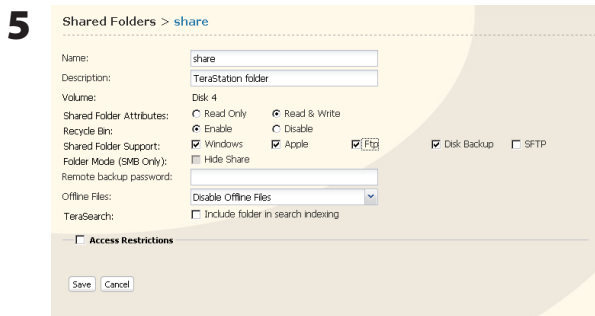
1 Select whether the shared folder is to be [Read Only] or [Read & Write].

2 Check [Ftp].

3 Click [Save].

The folder is now configured for FTP access. Do not forget to give read (or write) permissions for the FTP share to any users that will be accessing the share remotely. Folder permissions can only be changed from the Web Admin interface. Changing them remotely with FTP client software is not supported.

To access the TeraStation with an FTP client

Configure your FTP client software with the following settings:
- Host Name　　　　IP address of the TeraStation.
- Username　　　　Username registered on the TeraStation
- Password　　　　Password registered to the TeraStation
- Port　　　　　　21

Example ftp://192.168.11.150/
- You cannot write by FTP if the shared folder is set to read-only on the TeraStation.
- Access restrictions are applied based on the settings in the TeraStation. The restrictions aren't displayed for users without permissions for the share.
- To access your FTP share from outside of your network, you may need to configure your router and firewall. Consult your router documentation for more information.
- Shared folders appear as follows when connected by FTP:
  - disk1 share
  - usbdisk1
- The internal hard drive of the TeraStation is displayed as disk1, and a USB hard drive (optional) will be displayed as usbdisk1.
- "usbdisk1" is not displayed when the USB hard drive is not connected or access is restricted.

Accessing the TeraStation with an Anonymous user:

To allow anonymous access to your FTP share, disable access restrictions on the FTP share. Configure your FTP client as follows:
- Host Name　　　　IP address of the TeraStation
- Username　　　　anonymous
- Password　　　　any set of characters
- Port　　　　　　21

Example ftp://192.168.11.150/
- To make your FTP share available from outside your network, you will need to configure your router and firewall. Consult your router's documentation for information on how to allow FTP traffic.
- If the TeraStation joins a domain, anonymous users cannot access it.
- Folders created or copied via an AFP connection may not be deleted from the AFP connection. This is because an automatically generated ".AppleDouble" folder begins with a dot. To delete these files, use an SMB connection.
- Do not exceed 250 bytes for a file/folder name including directory path when you are creating it by using an FTP connection. Otherwise, you cannot view or delete it in Explorer or other applications.

Accessing from a NFS Client

Use the following procedure configure the TeraStation for access from UNIX with NFS.

Note: This section is for information only. Unix and NFS are not supported by Buffalo. If you choose to configure your TeraStation this way, it does not void your warranty, but you are on your own for tech support.

1 In the Web Admin interface, select [Network] - [NFS] - [NFS Service], and click [Modify Settings].

2

    1 Click [Enable].

    2 Click [Save].

Note:
• If you use a public folder of the TeraStation set by NFS as a hard drive for VMware ESX/ESXi, it is required to set [NFS Mode] to [Kernel mode] in order to use it (It is set to [User mode] by default).

• To set access restrictions by IP addresses, specify a [Network Address] and [Subnet Mask] from the screen above.
    (e.g.) To allow access from a client with the IP address 192.168.11.xxx:
        [Network Address]:   192.168.11.0
        [Subnet Mask]:   255.255.255.0
        xxx can be 1 to 254. Enter 0 (zero) for the [Network Address].
    (e.g.) To allow access from a client with the IP address 192.168.xxx.xxx:
        [Network Address]:   192.168.0.0
        [Subnet Mask]:   255.255.0.0
        xxx can be 1 to 254. Enter 0 (zero) for the [Network Address]

3 Click [NFS Folders Setup].

4

Choose a shared folder.

5
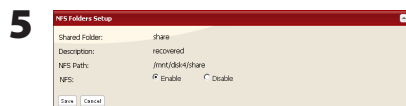
    1 Write down the NFS public path.

    2 Click [Enable].

    3 Click [Save].

6 Click [NFS Client Setup].
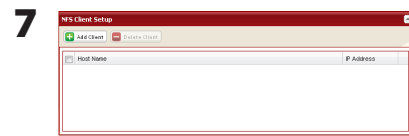
7 Click [Add Client].
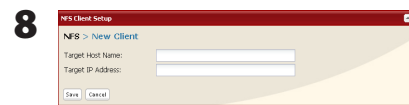
8
1 Type [Target Host Name] and [Target IP Address] of the NFS UNIX client.

2 Click [Save].

9 The IP address and the hostname of the client are added.

Notes:
• To remove, check the box next to the hostname and click [Delete Client].
• You may be able to connect via NFS from a computer that is not registered as a client.

10 Examples of commands to access a folder on the TeraStation from the NFS client:

From Linux:
mount -t nfs <IP Address>:<NFS public path for the TeraStation><the mounting point on the local computer>

(e.g.) mkdir /mnt/tsxl
> mount -t nfs 192.168.11.10:/mnt/array1/share /mnt/tsxl
>> In this example, TeraStation's IP address is "192.168.11.10", NFS publishing path is "/mnt/array1/share", and a mount point on the local computer is "/mnt/tsxl".

From Windows Services for Unix 3.5:
mount <IP Address>:<NFS publishing path for the TeraStation> <a network drive's letter (an error occurs if not available)>

(e.g.) mount 192.168.11.10:/mnt/array1/share z:
> In this example, TeraStation's IP address is "192.168.11.10", NFS publishing path is "/mnt/array1/share", and a network drive letter is "z".
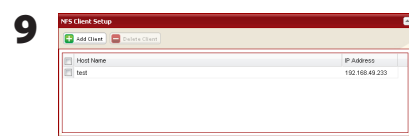
From Solaris10:
mount -<F nfs IP Address>:<NFS publishing path for the TeraStation><the mounting point on the local computer>

(e.g.) mkdir /mnt/tsxl
> mount -F nfs 192.168.11.10:/mnt/array1/share /mnt/tsxl
>> In this example, TeraStation's IP address is "192.168.11.10", NFS publishing path is "/mnt/array1/share", and a mount point on the local computer is "/mnt/tsxl".

Notes:
• Settings on the NFS Client will be applied to file access. However, if you write on root, uid and gid for all will be 99.
• You cannot unify the uid and gid for user management on the TeraStation and for the users on NFS clients.
• Root (admin) rights are required to perform the mount operation.
• If you mount as root for other users, each user will need access rights for the mount point.

You've completed the steps to access the TeraStation via NFS.

Encrypting Data Transmission

• Encrypting Data from the Web Admin interface

Access *https://<TeraStation's IP address>* instead of *http://...* to encrypt all data from the Web Admin interface.

Note:

Your computer may display "there is a problem with this site's security", but you may ignore this message and work normally.

• Encrypting FTP Transfer Data

First, in the Web Admin interface, navigate to [Shared Folder Support] - [Ftp]. Check the box by each shared folder to encrypt data transfers.
Enable SSL security in your FTP client to encrypt login passwords and files by using SSL/TLS for FTP communication.
Examples: In FileZilla's settings, select [FTP over TLS (explicit encryption)] for the server type. For Smart FTP, select [FTP over SSL explicit] in the settings.

Notes:

• Encryption processes may seriously reduce data transfer speeds. Your transfers may be as much as 10 times slower when using encryption.

• Depending on your computer's security settings, the message "there is a problem with this site's security" may be displayed, but you may ignore this message and work normally.

• SSL Key

Note:

This procedure is described for network administrators and advanced users. Do not try to configure this unless you know exactly what you're doing.

You may use encrypted keys such as https and FTPS for the Web Admin interface operations and FTP connections.

SSL (Secure Socket Layer) is a public key encryption method. SSL operation is managed by 2 files:

(1) server.crt (SSL Certificate)

TeraStation will send this certificate to other computers, which will use it as a key for encryption. The TeraStation will then receive encrypted data and use the server.key (SSL Key) to decrypt them.

This key includes Server Certificate on SSL, and your PC may decide if the certificate can be trusted or not. Your computer may display the message "There is a problem with the site's security certificate."

(2) server.key (SSL Key)

This is used to decrypt data encrypted by the server certificate.
Note:
Prepare the decrypted passphrase for the server.key (SSL Key).

Updating SSL Key

To update a server certificate and a private key for SSL, follow the procedure below.

1 In the Web Admin interface, navigate to [Network] - [Settings] - [Network Services] - [Add/Edit SSL Key].

2 Register server.key for [SSL Key] and server.crt for [SSL Certificate], then click [Import].
Note:
Save SSL key files (server.key and server.crt) on the root of Drive C. They should not be saved in a folder or path whose name includes multi-byte or special characters.

You've updated the SSL key.

Notes:

• The SSL key should not be password protected.
• If the Web Admin interface isn't accessible after updating, initialize the TeraStation.
• Updating the firmware will initialize 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. The TeraStation's web server is for advanced users only. Do not enable it unless you know what you're doing.

1 In the Web Admin interface, navigate to [Network] - [Settings] - [IP Address Settings]. Click [Modify Settings].

2 Select [Enable] for [Web Server]. Choose an external port (81 is the default) and a folder for the web server. Click [Save].

3
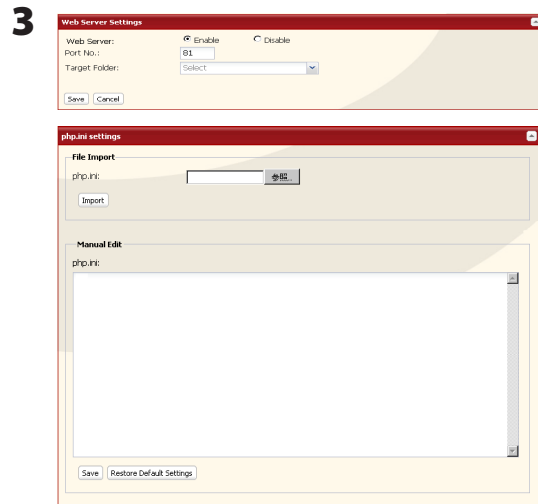
Edit the php.ini file to change the PHP language interpreter settings.

Note:
The web server uses version 1.4.23 of lighttpd, version 5.8.8 of Perl, and version 5.2.10 of PHP.

The Web server is now configured.

MySQL server

The TeraStation can be used as a MySQL server. A MySQL database may be installed and linked with the web server. The TeraStation's MySQL server is for advanced users only. Do not enable it unless you know what you're doing.

1 In the Web Admin interface, navigate to [Network] – [MySQL Server]. Click [Modify Settings].

2

MySQL Server Settings	
MySQL Server:	⦿ Enable ○ Disable
Port No.:	
Data Folder:	Select ▾
Save Cancel	
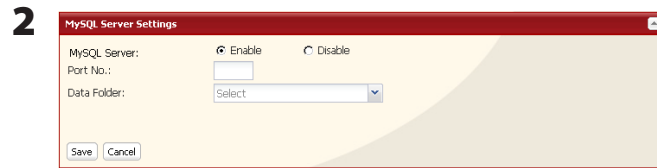
Select [Enable] for [MySQL Server], choose a [Port No.] and [Data Folder], and click [Save].

Note:
The TeraStation uses version 5.0.70 of MySQL server and version 3.2.2 of PhpMyAdmin.

The MySQL server is now configured.

Appendix

Troubleshooting

The TeraStation includes NAS Navigator2 on the internal drives in a folder called "info".

If you can't access your TeraStation:

The following list contains the typical symptoms and causes when TeraStation cannot be found on NAS Navigator2 or you cannot display the Web Admin interface.

Cause 1 Cables are not connected properly.
The hard drive is not physically connected or may have a bad connection. Reconnect the power cable and LAN cable and restart your computer and the TeraStation.

Cause 2 The firewall is enabled, or software running in the background is installed.
Disable the firewall, or uninstall the software that includes the firewall. Then search for the TeraStation again.

Cause 3. Both wireless and Ethernet adapter are enabled.
Disable any adapters other than the LAN adapter to connect to the TeraStation.

Cause 4 The defective LAN cable or the connection is not stable.
Change a port on the hub to connect or replace the LAN cable.

Cause 5 Your LAN board, card, or adapter is malfunctioning.
Replace a LAN board, card, or adapter.

Cause 6. The LAN board you are using or the transfer mode of the hub is not set.
Change the LAN board, or change the transfer mode to [10M half-duplex] or [100M half-duplex].
Some LAN boards and hubs may not be connected to the network properly if the transfer mode is set to [Auto Negotiation].

Cause 7 There is a network bridge.
Delete any unused network bridges.

Cause 8 You are searching from a different network.
You cannot search for the TeraStation over network segments. Connect the TeraStation to the same subnet as the computer you use for search.

Cause 9 TCP/IP does not work properly.
 Reinstall the LAN Adapter's driver.

If Shared folders on the TeraStation would not suddenly open:

If you map Shared Folders on the TeraStation as a Network Drive, you may suddenly not be able to access TeraStation when the IP address or Workgroup is changed.
In such a case, open the shared folder on the TeraStation by using NAS Navigator2.

Note: • On Mac OS, TeraStation is mounted as a drive icon on the desktop, or displayed in the sidebar on the Finder.
- If the problem still persists after you tried the procedures described above on Mac OS, select [System] - [Storage] - [Disks] - [Check Disk] - [Delete any hidden, non-essential MacOS dedicated files] on the Web Admin interface, and click [Check].

If a shared folder does not open even though NAS Navigator2 recognizes the TeraStation

If power outage occurred or the power cable is unplugged while the TeraStation is on, the TeraStation's firmware may be corrupted and shared folders may not open (You can search for folders on NAS Navigator2 but they do not open).

Note: In such a case, TeraStation Name displayed on NAS Navigator2 or Web Admin interface is displayed as TS-QVHL-EM*** (the example of TS-QVHL Series)*** expresses last 3 digits of the TeraStation's MAC address

In such a case, download the latest firmware from BUFFALO's website (www.buffalotech.com) and update it.

Data Backup

While using the TeraStation, you may loose your important data due to sudden accidents, hard disk failure, or accidental misoperation. Back up your data regularly!
For best results, back up your data to Buffalo drives like the TeraStation, LinkStation, or DriveStation series.

GPL Information

The source code for Buffalo products that use GPL code is available at *http://opensource.buffalo.jp/* .

Update the TeraStation's Firmware

You may download updated firmware from Buffalo Technology's website. Double-click the file you downloaded to update the firmware.

Compliance Information

FCC Warning

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.

CE Mark Warning

CE Mark Warning

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.

Environmental Information

- The equipment that you have purchased required the extraction and use of natural resources for its production.

- The equipment may contain hazardous substances that could impact health and the environment.

- In order to avoid the dissemination of those substances in our environment and to diminish the load on natural resources, we encourage you to use the appropriate take-back systems.

- The take-back systems will reuse or recycle most of the materials of your end of life equipment appropriately.

- The crossed-out wheeled bin symbol invites you to use those systems.

- If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administration.

KC

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