

Network Attached Storage

TeraStation WSS WSH5010N6

User Manual



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

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Chapter 1 Getting Started

Diagrams

WSH5610DN6



1 Power Button (心)

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

2 Power LED

The LED glows blue when power is on.

3 Access LED

Shows network activity. This LED blinks green when hard drives are being accessed.

4 Fail LED

If there is an error on the drives, this LED glows amber. Open Buffalo Dashboard to see error messages.

5 LAN1 LED

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

6 LAN2 LED

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

7 LCD Panel

This display shows the status of many TeraStation settings.

8 Mode Button

Not in use normally; if the TeraStation beeps, press this button to stop the beeping.

9 Select Button

Not in use normally.

10 Drive Lock

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

11 Reset Button

To shut down and reboot the TeraStation, press and hold this button. Do not use this button normally.

12 Status LEDs

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

13 VGA Port

You can connect a VGA monitor to this port. Connecting a monitor directly to the TeraStation is only supported for monitoring the progress of Windows Update.

14 HDMI Port

You can connect a HDMI monitor to this port. Connecting a monitor directly to the TeraStation is only supported for monitoring the progress of Windows Update.

15 eSATA Port

eSATA-compatible hard drives are available with this port. Turn the TeraStation off before connecting the drives.

16 UPS Port

Connect to a UPS.

17 USB 3.0 Port (SS€→)

Compatible Buffalo USB 3.0 hard drives, USB memory devices, and USB UPSs can be connected. USB hubs are not supported.

Compatible Buffalo USB hard drives, USB memory devices, and USB UPSs can be connected. USB hubs are not supported.

19 LAN Port 2

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

20 LAN Port 1

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

21 Power Connector

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

22 Fan

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

23 Anti-Theft Security Slot

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

24 Link LED

Glows amber when the TeraStation is connected to a network.

25 Act LED

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

Opening Windows Storage Server

To connect Windows Storage Server, follow the procedure below.

Note: If using macOS, download and install "Microsoft Remote Desktop" from the Mac App Store.

- **1** Double-click the NAS Navigator2 icon () to start NAS Navigator2.
- **2** Right-click your TeraStation's icon and select *Open Remote Desktop*. For macOS, select the TeraStation's icon while holding down the control key, then select *Open Remote Desktop*.

If the message "The identity of the remote computer cannot be verified. Do you want to connect anyway?" is displayed, click *Yes* or *Continue*.

Menu 👻 🔠 View	👻 🇀 Browse 🛭 🚱 Refresh	
Browse Shar Open Remo Properties Create Deskt	es te Desktop top Shortcut	
/SH5610DN6 Series		Workgroup: WORKGROUP
/SH5610DN6 Series	C: 14.9 GB/58.9 GB (25.3%)	Workgroup: WORKGROUP IP Address: 192.168.10.29
/SH5610DN6 Series	C: 14.9 GB/58.9 GB (25.3%) D: 0.4 GB/7451.9 GB (0.0%)	Workgroup: WORKGROUP IP Address: 192.168.10.29 Subnet Mask: 255.255.255.0
ISH5610DN6 Series	C: 14.9 GB/58.9 GB (25.3%) D: 0.4 GB/7451.9 GB (0.0%)	Workgroup: WORKGROUP IP Address: 192.168.10.29 Subnet Mask: 255.255.0 Default Gateway: 192.168.10.1
ISH5610DN6 Series	C: 14.9 GB/58.9 GB (25.3%) D: 0.4 GB/7451.9 GB (0.0%)	Workgroup: WORKGROUP IP Address: 192.168.10.29 Subnet Mask: 255.255.0 Default Gateway: 192.168.10.1 MAC Address: 00:04:5F:A1:5A:0E
/SH5610DN6 Series	C: 14.9 GB/58.9 GB (25.3%) D: 0.4 GB/7451.9 GB (0.0%)	Workgroup: WORKGROUP IP Address: 192.168.10.29 Subnet Mask: 255.255.2 Default Gateway: 192.168.10.1 MAC Address: 00:04:5F:A1:5A:0E Firmware: 3.10

3 Enter the admin username and password and press the Enter key. The default username and password are "Administrator" and "password".

Windows Storage Server will open in the remote desktop.

Changing Settings

Configuring Date and Time

1 Click the time in the system tray of Windows Storage Server.



2 Click Change date and time settings > Change date and time, select the current date and time, and click OK.



Note: From the *Internet Time* tab, click *Change settings*, then select *Synchronize with an Internet time server*. The date and time can be obtained automatically.

Creating a Shared Folder

No shared folders are configured by default. Before using the TeraStation, follow the procedure below to create one or more shared folders.

This is an example to create a shared folder, named "Share" in drive D, which anyone can access.

1 From Server Manager, click *Tools* > *Computer Management*.



2 Click Shared Folders.

3 Right-click *Shares* and click *New Share*.

🛃 Computer Management				
File Action View Help				
🗢 🄿 🙍 🖬 🔂 🖬				
🜆 Computer Management (Local	Name	^		
🗸 🙀 System Tools	Shares -			
> 🕑 Task Scheduler	Session	Nev	w Share	
> 🛃 Event Viewer	Conen F			
> 😥 Shared Folders	Se open i	Nev	N	>
> 🜆 Local Users and Groups		Hel	n	
> 🔊 Performance			٢	
📇 Device Manager				
🗸 🔄 Storage				
> 🐌 Windows Server Backup				
📅 Disk Management				
> 🚡 Services and Applications				

4 Click Next.

5 Enter the path of an existing folder or a new folder, then click *Next*.

Create A Shared Folder	Wizard	×
Folder Path Specify the path	to the folder you want to share.	23
Computer name:	WSH5610DN6A0E	
Type the path to the folder.	older you want to share, or click Browse to pick the fold	er or add a new
Folder path:	D:\Share	Browse
Example:	C:\Docs\Public	
	< Back Next >	Cancel

Notes:

- Enter "D:\Share" into the folder path to create the shared folder for the first time.
- If the message "The system cannot find the specified path. Do you want to create it?" is displayed, click Yes.

6 Enter a name for the share and a description (optional), then click *Next*.

Create A Shared Folde	er Wizard X
Name, Description Specify how peo	ple see and use this share over the network.
Type information abo offline, click Change.	out the share for users. To modify how people use the content while
Share name:	Share
Share path:	\\WSH5610DN6A0E\Share
Description:	
Offline setting:	Selected files and programs available offline Change
	< Back Next > Cancel

7 Select "Customize permissions", then click *Custom*.

Create A Shared Folder Wizard	×
Shared Folder Permissions Permissions let you control who can see the folder and the level of access they have.	23
Set the kind of permissions you want for the shared folder.	
○ All users have read-only access	
 Administrators have full access; other users have read-only access 	
 Administrators have full access; other users have no access 	
Customize permissions	
Custom	
By default, only share permissions are set on this folder. To control local access permissions to this folder or objects within the folder, dick Custom and then modify t permissions on the Security tab to apply specific permissions on the folder.	he
< Back Finish C	Cancel

8 Choose *Everyone* and select the "Allow" checkbox for "Change".

Customize Permiss	ions			?	\times
Share Permissions	Security				
Group or user name	es:				
Sector Se					
		Ado	d	Remov	'e
Permissions for Eve	eryone		Allow	Deny	,
Full Control					
Change			\checkmark		
Read					
			ОК	Ca	ncel

9 From the *Security* tab, click *Edit* > *Add*.

Customize Permis	sions		?	×
Share Permissions	Security			
Object name: [):\Share			
Group or user nam	ies:			_
🎎 Everyone				^
SCREATOR C	WNER			
SYSTEM				~
<			>	
To change permis	sions, click Edit.		Edit	
			_	
Permissions for Ev	reryone	Allow	Deny	_
Permissions for Ev Full control	reryone	Allow	Deny	^
Permissions for Ev Full control Modify	reryone	Allow	Deny	^
Permissions for Ev Full control Modify Read & execute	eryone		Deny	^
Permissions for Ev Full control Modify Read & execute List folder conte	e ents		Deny	^
Permissions for Ev Full control Modify Read & execute List folder conte Read	e ents		Deny	^ ~
Permissions for Ev Full control Modify Read & execute List folder conte Read For special permis click Advanced.	e ents sions or advanced	Allow	dvanced	~

10 Enter "Everyone" under "Enter the object names to select", then click *OK*.

Select Users or Groups		×
<u>S</u> elect this object type: Users, Groups, or Built-in security principals		Object Types
From this location:		
WSH5610DN6A0E		Locations
Enter the object names to select (<u>examples</u>):		
Everyone		Check Names
Advanced	ОК	Cancel

11 Choose "Everyone", then select the "Allow" checkbox for *Modify*.

📕 Permissions for Share		×
Security		
Object name: D:\Share		
Group or user names:		
SECREATOR OWNER		
SYSTEM Administrators (WSH5610DN	6A0E\Administrato	(2)
Leveryone		137
Sers (WSH5610DN6A0E\U	lsers)	
	A <u>d</u> d	<u>R</u> emove
Permissions for Everyone	Allow	Deny
Full control	\checkmark	□ <u>^</u>
Modify	\checkmark	
Read & execute	\checkmark	
List folder contents	\checkmark	
Read	\leq	
OK	Canad	Apply
OK	Cancel	Арріу

12 Click OK > OK > Finish > Finish.

Notes:

Enable a guest account:

- (1) From Server Manager, click *Tools > Computer Management*.
- (2) Click Local Users and Groups.
- (3) Double-click Users > Guest.
- (4) From the General tab, clear the "Account is disabled" checkbox, then click OK.

Enable access permissions:

- (1) From Server Manager, click *Tools > Computer Management*.
- (2) Click Shared Folders.
- (3) Double-click Shares, then double-click the desired shared folder.
- (4) From the Security tab, click Edit.
- (5) From the *Local Users and Groups* list, add the users or groups that will be allowed access (the groups and users must be created beforehand). To allow access for all users, add a guest and change Administrator's "Access Permission" to "Full Control".

Turning the TeraStation On and Off

Press the power button on the TeraStation to turn it on and off. Or you can turn off your TeraStation by following the procedure below.

1 Click the Start button.

ம

2 Click the

icon, then Shut down.

3 Select the reason why you want to shut down, then click *Continue*.

When the power LED on the front of the TeraStation turns off, the shutdown process is complete.

Note: Always shut down the TeraStation before unplugging it. The TeraStation can be damaged if it is suddenly unplugged without being powered down first.

Installing Antivirus Software

Installing antivirus software on the TeraStation is strongly recommended. The installation process may vary depending on which antivirus software you use.

Chapter 2 Preinstalled Software

The following software is preinstalled on the TeraStation.

- RAID Builder
- Buffalo Dashboard
- Email Notification
- Buffalo Replication
- TeraStation Backup & Replication Folder Settings

RAID Builder

RAID Builder is used to create RAID volumes. See the "Storage Management" chapter for more details. To launch RAID Builder, you must be logged in as a member of the Administrators group in Windows Storage Server. **Note:** This software cannot be accessed by multiple users at the same time. Before launching it, make sure that it is not being used by another user.

鬜 RAID Builder		×
RAID Mode		
RAID 6 volume		
O RAID 5 volume		
RAID 10 volume		
◯ Striped volume	© P Parity	Q H
	Build a RAID 6 volume using 6 drives	
	Available capacity:7.450 GB	
	Available Capacity.7,450 Gb	
<current raid="" statu:<br="">RAID Mode:RAID 6 vo Capacity:7,451 GB Status:Normal</current>	s> lume	
Format RAID	Build New RAID Array	Cancel

Buffalo Dashboard

Buffalo Dashboard displays system information and dismounts drives. To launch it, double-click the Buffalo

Dashboard icon in the system tray.

Note: This software cannot be accessed by multiple users at the same time. Before launching it, make sure that it is not being used by another user.



ltems	Descriptions
	Product Name : Displays the model name of the TeraStation.
	Computer Name : Displays the hostname of the TeraStation.
	Domain Name : Displays the type of domain that the TeraStation is a
	member of.
	OS : Displays the type of Windows installed on the TeraStation.
System Information	OS Version : Displays the version of the OS.
	Firmware: Displays the firmware version of the TeraStation.
	Check for updates: Enables or disables checking for new firmware
	releases. When a new firmware version is available, you will be
	notified here.
	Manufacturer: Displays "Buffalo Inc.".
Temperature	Displays the temperature of the system.
Fan	Displays the fan rpm.

Items	Descriptions
Backup	Displays the status of backup and replication.
Network Information	Displays IP addresses, subnet masks, default gateways, LAN port numbers, link speed, and status.
	Displays the status, drive numbers, names, capacity, and physical sector sizes of each drive.
Drivo	Options:
Dive	Shut down the TeraStation when the temperature of the drive
	becomes abnormally high: The TeraStation will automatically shut
	down if the drive gets too hot.
ERROR	Displays error or information codes. For more detail information, refer to the "Errors and Statuses on Buffalo Dashboard" section below.

Note: "Options" and "Check for updates" functionalities are only available when logged in as an administrator.

Errors and Statuses on Buffalo Dashboard

Note: The "x" in the message is a number of drive or assigned drive letter where an error or information event occurs.

Message	Description	Corrective Action
SYSTEM Error E11 Fan Failure	An error occurred in the fan speed.	Check that no foreign objects or dust are clogging the fan. If any foreign objects or dust are found, use a pair of tweezers, air duster, or other tools to remove them. If the error is displayed again, contact Buffalo technical support for assistance.
SYSTEM Error E12 Cooling Failure	A rise in the system temperature may have exceeded the allowable safety value.	Do not place objects in the area around the TeraStation. Also, move the TeraStation to a cool location. Make sure that the TeraStation's fan is working normally.
HDx Error E16 HDx Not Found	Unable to find the drive.	The drive may be disconnected or may have failed.
HDx Broken E30 Replace the DISK	An error occurred, so the drive was removed from the volume.	Replace the drive.
SYSTEM I10 TOO HOT !	A rise in the system temperature may have exceeded the allowable safety value.	Move the TeraStation to a cool location. Do not place objects in the area around the TeraStation.
Operation I12 DEGRADE MODE	Operating in degraded mode.	Check the drive where the error occurred and replace it with a new drive. For the replacement method, refer to chapter 6, "Drive Replacement".
RAID I18 x Drive Rebuilding	Resynchronizing the volume. Note: Transfer speeds are slower during the resynchronizing process.	Wait until resynchronization finishes. It will take about 8–12 hours per terabyte for a RAID 5 volume and 3–6 hours per terabyte for a mirrored volume. This message will disappear when resynchronization finishes.
Replication I33 Replicate Failure	An error occurred during replication.	From Buffalo Replication, click <i>Sync</i> to execute resynchronization. If the error is displayed again, contact Buffalo technical support for assistance.
New Firmware I52 Available	A new firmware version has been released.	Update the firmware.

Message	Description	Corrective Action
154 Backup Failure	The backup job failed.	Make sure that the backup job is configured correctly. Make sure that the NAS is on and not in standby mode. If the backup job still fails, check the status of NAS, the network, and the backup source and destination. Also, check the backup log to see if any errors were recorded.

Email Notification

Your TeraStation can send you email reports when settings are changed or an error occurs. See the "Enabling Email Notification" section in chapter 5 for more details.

To launch Email Notification, you must be logged in as a member of the Administrators group in Windows Storage Server.

Note: This software cannot be accessed by multiple users at the same time. Before launching it, make sure that it is not being used by another user.

🖳 Email Notification	×
Enable email notification	
Send to	
Email Address	New
	Edit
	Delete
A theatiestics	
Authentication	
SMTP Server Address:	Port Number: 25
User Authentication Method:	None ~
POP Server Address:	Port Number: 110
Usemame:	Password:
SSI /TI S-	Disable
555725.	
	Accept untrusted or self-signed certificates
Email Settings	
Sender Address:	
Title:	Torp Station Status
nue.	
	Content Options
Test Message	OK Cancel Apply

Buffalo Replication

Your TeraStation can be synchronized with another TeraStation, replicating most data. See the "Configuring Replication" section in chapter 4 for more details.

To launch Buffalo Replication, you must be logged in as a member of the Administrators group in Windows Storage Server.

Note: This software cannot be accessed by multiple users at the same time. Before launching it, make sure that it is not being used by another user.

Status	Replication Source	Replication Target	

TeraStation Backup & Replication Folder Settings

Before using it as a backup device on the network, configure your TeraStation in "TeraStation Backup & Replication Folder Settings".

To launch TeraStation Backup & Replication Folder Settings, you must be logged in as a member of the Administrators group in Windows Storage Server.

Note: This software cannot be accessed by multiple users at the same time. Before launching it, make sure that it is not being used by another user.

FeraStation Backup & Replication Folder Settings			
	Label	Folder	Backup Device Access Key
⊁ ∗ 1			
t is recomme	ended that you set a backup device	e access key for security. In order for anothe	f st Save Close

Items	Descriptions
Label	Enter a name for the backup or replication destination. When you search for backup devices on the network, this name will appear.
Folder	Specify a shared folder where backup data will be stored. Do not select the root directory where the shared folder is created.
Backup Device Access Key	Enter the desired characters for a backup device access key. The backup device access key may contain up to 8 alphanumeric characters, hyphens (-), and underscores (_). The first character should not be a symbol. You may leave this field blank if you do not want a backup device access key, but for security reasons we highly recommend entering one for the shared folder. If a backup device access key is configured for the shared folder, that folder will not show up as a target for the replication destination or backup source or destination when configuring a backup job on another Buffalo device unless it's entered.
	To remove a folder from the list of available backup targets, select the folder and click this button.
Save	Saves the settings.
Close	Exits TeraStation Backup & Replication Folder Settings.

Chapter 3 Storage Management

Working with Volumes

Notice When Creating Volumes

- To create a volume, use RAID Builder instead of the Disk Management option in Windows Storage Server.
- When volumes are deleted, formatted, or changed to another volume type, all data stored on the volumes is erased. Before executing these operations, back up any important data.
- In this manual, "recover" means reverting the TeraStation (including data) to its former state prior to the drive failure. It doesn't refer to reading data from a failed drive.

Volume Types

RAID 6 Volumes

RAID 6 distributes two parity blocks when writing data. The usable space is equal to the sum of the capacity of four drives. If two drives in a RAID 6 volume fail, data on the volume can be recovered after the failed drives are replaced. However, if three or more drives fail, all data is lost.

RAID 5 Volumes

RAID 5 distributes a parity block when writing data. The usable space is equal to the sum of the capacity of the five drives. If one drive in a RAID 5 volume fails, data on the volume can be recovered after the failed drive is replaced. However, if two or more drives fail, all data is lost.

RAID 10 Volumes

Mirrored pairs of drives in RAID 1 volumes are combined into a RAID 0 volume. The usable space is equal to the capacity of three drives. The same data is written to multiple drives so that if one drive from either or both RAID 1 volume fails, data on the volume can be recovered after the failed drives are replaced. However, if two drives on the same RAID 1 volume or three drives in total fail, all data is lost.

Striped Volumes

RAID 0 stripes data across the multiple drives, but lacks parity blocks like RAID 5 or RAID 6. The usable space is equal to the capacity of all drives on the TeraStation. RAID 0 doesn't have any redundancy so data cannot be recovered if even a single drive fails.

Creating a Volume

To create a volume, follow the procedure below. Successfully following the procedure will erase all data stored on the volumes.

1 Click the Start button and click *RAID Builder*.

2 Select the desired volume type under "RAID Mode" and click *Build New RAID Array*.

鬜 RAID Builder		×
RAID Mode		
RAID 6 volume		
○ RAID 5 volume		BF
○ RAID 10 volume		
O Striped volume	Q P Parity	0 1
	Build a RAID 6 volume using 6 drives.	
	Available capacity:7,450 GB	
<current raid="" statu<br="">RAID Mode:RAID 6 vo Capacity:7,451 GB Status:Normal</current>	s> lume	
Format RAID	Build New RAID Array	Cancel

3 Click *OK* when a warning message is displayed.

- **4** Click *OK* again. Creating the volume will begin. The TeraStation will shut down automatically after about a minute.
- **5** When the power LED is distinguished, press the power button on the TeraStation to turn it on.

6 Connect Windows Storage Server via the remote desktop.

7 Click the Start button and click *RAID Builder*.

8 Click *Format RAID* and click *OK*.

After creating the volume is completed, refer to chapter 1 to create a shared folder.

Notes:

- If the I18 message is displayed under "ERROR" on Buffalo Dashboard, the volume has not been created yet. Wait until the message disappears and try from the step 7 again.
- You can also format the volume using the "Format RAID" button on RAID Builder.

Chapter 4 Backup and Replication

Data stored in the TeraStation may be lost through drive failure or wrong operation. To avoid losing data accidentally, back up your data regularly.

You can back up data using the following functions:

- Windows Server Backup
- Buffalo Replication
- DFS Replication

Backing Up in Windows Storage Server

Preparing a Backup Destination

Follow the procedure below to set your backup schedule.

1 From Server Manager, click *Tools > Windows Server Backup*. The "Windows Server Backup" wizard will start.



2 Click *Local Backup*. If "Reading data; please wait..." is displayed, please wait until any messages disappear.



3 Right-click on "Local Backup" and select *Backup Schedule*.... The "Backup Schedule Wizard" will start.





5 Select "Custom" and click *Next*.

Backup Schedule Wizard	wp Configuration
Getting Started Select Backup Configurat Select Items for Backup Specify Backup Time Specify Destination Type Confirmation Summary	 What type of configuration do you want to schedule? Full server (recommended) I want to back up all my server data, applications and system state. Backup size: 17.47 GB Custom I want to choose custom volumes, files for backup.
	< Previous Next > Finish Cancel

Click Add Items.

7	Select the backup source folders or drives and click OK
-	Sciect the backup source lolaers of arrives and click on.

Select Items	Х
Specify items to include in the backup by selecting or clearing the associated check boxes. The items that have included in the current backup are already selected.	at you
Bare metal recovery System state EFI System Partition Coal disk (C:) Coal disk (D:)	
OK Cance	: :

8 Click Next.

9 Specify the schedule to run the backup and click *Next*.

🐌 Backup Schedule Wizard					×
Specify Bac	kup Time				
Getting Started	How often and when do	o you want to run ba	ckups?		
Select Backup Configurat	Once a day				
Select Items for Backup	Select time of day:	9:00 PM	\sim		
Specify Backup Time	O More than once a da	У			
Specify Destination Type	Click an available tir	me and then click Ad	d to add it to the	backup schedule.	
Confirmation	Available time:	_	Scheduled tin	ne:	
Summary	12:00 AM 12:30 AM 1:00 AM 1:30 AM 2:00 AM 2:30 AM 3:00 AM 3:30 AM 4:00 AM 4:30 AM	Add > < Remove	9:00 PM	~	
	< Previo	ous Next >	Finish	Cancel	

10 Select the backup destination and click *Next*.

🐌 Backup Schedule Wizard	X
Specify Des	tination Type
Getting Started Select Backup Configurat Select Items for Backup Specify Backup Time Specify Destination Type Select Destination Disk Confirmation Summary	 Where do you want to store the backups? Back up to a hard disk that is dedicated for backups (recommended) Choose this option for the safest way to store backups. The hard disk that you use will be formatted and then dedicated to only store backups. Back up to a volume Choose this option if you cannot dedicate an entire disk for backups. Note that the performance of the volume may be reduced by up to 200 percent while it is used to store backups. We recommend that you do not store other server data on the same volume. Back up to a shared network folder Choose this option if you do not want to store backups locally on the server. Note that you will only have one backup at a time because when you create a new backup it overwrites the previous backup.
	< Previous Next > Finish Cancel

11 Step through the wizard to finish.

Recovering Backup Data

Follow the procedure below to recover the backup data to the TeraStation.

Note: Bare-metal recovery is not supported for the backup data stored using the backup function of Windows Storage Server.

1 From Server Manager, click *Tools > Windows Server Backup*. The "Windows Server Backup" wizard will start.



2 Click *Local Backup*. If "Reading data; please wait..." is displayed, please wait until any messages disappear.



3 Right-click on "Local Backup" and click *Recover...*. The recovery wizard will start.

ᡖ wbadmin - [Wir	ndows Server Backup (Local)\Local Backup]]	
File Action Vie	w Help		
🗢 🔿 🔁 📰	?		
🐌 Windows Server	Backup (I Local Backup		
🐌 Local Ba	Backup Schedule		F
	Backup Once		s
	Recover		
	Configure Performance Settings		e
	View	>	
	Help		

4 Select where the backup data is saved and click *Next*. When "A backup stored on another location" is selected, specify the folder of the backup data in the next page.

Secovery Wizard	×
Getting Star	ted
Getting Started Select Backup Date Select Recovery Type Select Items to Recover Specify Recovery Options Confirmation Recovery Progress	You can use this wizard to recover files, applications, volumes, or the system state from a backup that was created earlier. Where is the backup stored that you want to use for the recovery? ① This server (WSH5610DN6A0E) ① A backup stored on <u>a</u> nother location To continue, click Next.
	< <u>P</u> revious <u>N</u> ext > <u>R</u> ecover Cancel

5 Select the date when a data backup occurred and click *Next*.

b Recovery Wizard				×
Select Back	up Date			
Getting Started Select Backup Date Select Recovery Type Select Items to Recover Specify Recovery Options Confirmation Recovery Progress	Oldest available backup: Newest available backups Select the date of a back Select the date of a back Sun Mon Tue Wed 1 2 3 7 8 9 10 14 15 16 17 21 22 23 24 28 29 30 31	1/5/2018 4:37 PM : 1/5/2018 4:37 PM cup to use for recover 2018 I Thu Fri Sat 4 5 6 11 12 13 18 19 20 25 26 27	1 ry. Backups are available fo Backup date: Time: Location: Status: Recoverable items:	or dates shown in bold. 1/5/2018 4:37 PM Local Disk (D:) Available online Local disk (C:)(Sele
		< Previous	Next > Reco	Cancel

6 Select the recovery targets and click *Next*.

B Recovery Wizard		×
Select Rec	overy Type	
Getting Started Select Backup Date Select Recovery Type Select Items to Recover Specify Recovery Options Confirmation Recovery Progress	 What do you want to recover? Files and folders You can browse volumes included in this backup and select files and folders. Hyper-V You can restore virtual machines to their original location, another location or copy the virtual hard disk files of a virtual machine. Volumes You can restore an entire volume, such as all data stored on C:. Applications You can recover applications that have registered with Windows Server Backup. System state You can restore just the system state. 	
	< Previous Next > Recover Cancel	

7 Step through the wizard to finish.

Configuring Replication

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

Note: The replication operation may not proceed properly if a large number of files or a large capacity file have been replicated continually for a long time, causing too large of a data load. Before starting replication, check if there are any possible pauses for operational issues.

Differences Between Buffalo Replication and DFS Replication

Buffalo Replication

- One-way replication (from the TeraStation to another device)
- Another Buffalo NAS devices can easily be configured for the replication destinations.

DFS Replication

- Two-way replication
- The Active Directory domain environment is required and the TeraStation should be joined to the domain.

If your environment must join the Active Directory domain, use DFS Replication. If joining the Active Directory is not required, or if a TeraStation or LinkStation has been configured as the replication destination, using Buffalo Replication is recommended.

Before Using Replication

- For best results, use static IP addresses with the same subnet masks for both replication TeraStations (source and destination). If on a VPN network, configure the network settings so that broadcast packets are not dropped.
- Setting the TeraStation on a 1000 Mbps network is recommended.
- Up to five replication tasks can be created.
- Filenames and file paths that will be copied by replication should be within 170 characters. Files with filenames that are longer than 170 characters may not be copied correctly.

Buffalo Replication

If using Buffalo Windows Storage Server-installed TeraStations as both the replication source and destination, start from step 1. If using a different TeraStation as the replication destination, refer to that TeraStation's user manual to configure it as a replication destination. After you finish configuring on the TeraStation's Settings, go to step 3.

2 Click the blank space under "Label" and enter a label for the folder. Click under "Folder" and select the folder as a replication destination. Enter the desired characters for a backup device access key and click *Save* when finished.

TeraStation Backup & Replication Folder Settings X					
	Label	Folder	Backup Device Access Key		
} ∗ 1					
It is recommended that you set a backup device access key for security. In order for another device to use the folder as a replication destination or backup source or destination, you must Save Close enter the access key under the setup for that function.					

3 Click *Buffalo Replication* in the Start menu on the replication source TeraStation's Windows Storage Server.

¹ Click *TeraStation Backup & Replication Folder Settings* in the Start menu on the replication destination TeraStation's Windows Storage Server.

4 Click the blank space under "Replication Source", click . , and select a folder from the list as the replication source folder, then click *OK*.

Status	Replication Source	Replication Target	
1			

5 If you had configured a backup device access key to the replication destination folder, click *Set Backup Device Access Key*. If you didn't, skip to step 7.

6 Enter the configured backup device access key of the replication destination folder and click *OK*.

Set Backup Device Acc	ess Key	×
Backup Device Access	s Key	
	ОК	Cancel

7 Click the blank space under "Replication Target" and select the folder, then click *Select* from a folder list. If no shared folders appear, click *Refresh* and try again.

To configure folders on the device that is located on another network, click *Add* and enter the IP address of the device, then click *Save*. After the IP address is added to the list, click *Refresh* again to add the folder to the list of folders.

Replication Target				×
TeraStations and LinkS	itations 🛛 🖒 Refresh 📕			
Hostname WS5420RN6DBB WSH5610DN6XXX WSH5610DN6XXX	IP Address 192.168.10.22 192.168.10.29 192.168.10.29 192.168.10.29	Target Folder repdst Label Label1		
TS5410D2FD	192.168.10.38	rep_dst		
IP. Addresses	O Delete			
IP Address	Velete			
			Select	Cancel

When finished configuring, click *Apply*.

Status	Replication Source	Replication Target	
1 🗌 🖉 Edting	D:\rep_src	TS5410D2FD@rep_dst	
2			

9 Click *OK*. The task will start a differential overwrite from the replication source data to the replication destination. The task will start a full backup from the replication source data to the replication destination after deleting existing files in the replication destination.

Notes:

- To delete the settings from the list, select the task and click Delete.
- The Ethernet port number to use for replication cannot be specified in the replication task.
- The following files and folders will not be replicated: Files with periods (.) or underscores (_) as the first character in their name. Folders with periods (.) or underscores (_) as the first character in their name. .AppleDesktop/ Network Trash Folder/ TheVolumeSeHngsFolder/ .DS_Store/ .AppleDouble/ .AppleDB/

If the Network Settings Are Changed After Replication Tasks Are Created

If the network settings are changed after replication tasks are created, the TeraStation cannot communicate with the replication destination TeraStation and replication may fail. For example, disconnecting the Ethernet cable and reconnecting it to another LAN port or changing the IP address of the replication source or destination TeraStation. If the network settings are changed, refresh the list of TeraStations and LinkStations as follows.

1 Click *Buffalo Replication* in the Start menu on Windows Storage Server.

2 Click *Refresh* and refresh the detected TeraStations and LinkStations list.

3 When the TeraStation that the network settings were changed is displayed in the refreshed list, close the window and click *Sync*.

DFS Replication

DFS (Distributed File System) is a set of client and server services that allows Windows users to organize many distributed SMB file shares into a distributed file system.

To use DFS Replication, the TeraStation must be joined to an Active Directory domain. Make the necessary settings as detailed below to use DFS Replication on Windows Storage Server.

This section uses the following environment parameters as an example: Replication Source: "WSH5610DN6A0E" Replication Destination: "Server-A"

Namespace Server: "WSH5610DN6A0E" Namespace Name: "Public2" Namespace Folder: "buffalo-share" Replication Group: "Buffalo_DFS"

Replication Source Folder: "D:\rep_src" Replication Destination Folder: "D:\rep_dst"
Joining an Active Directory

1 From Server Manager, click *Local Server*.

🔁 Server Manager		
Server Ma	nager • Local Se	erver 🛛 🕫 🖡
Dashboard	For WSH5610DN6A08	E
Local Server	Computer name	WENSELODNEADE
All Servers	Workgroup	WORKGROUP
File and Storage Services >		
	Windows Firewall	Private: On
	Remote management	Enabled
	Remote Desktop	Enabled
	NIC Teaming	Disabled
	Ethernet	IPv4 address assigned by DHCP, IPv6
	Ethernet 2	Not connected

2 Click the hostname of your TeraStation.

3 From the *Computer Name* tab, click *Change*.

System Properties		×
Computer Name Hardw	vare Advanced Remote	
Windows use on the netwo	es the following information to identify your computer ork.	
Computer description:		
	For example: "IIS Production Server" or "Accounting Server".	
Full computer name:	WSH5610DN6A0E	
Workgroup:	WORKGROUP	
To rename this computer or change its domain or Change Change		
	OK Cancel Apply	

4 Select "Domain", enter a domain name, and click *OK*.

Computer Name/Domai	n Changes	×		
You can change the name and the membership of this computer. Changes might affect access to network resources.				
Computer name:				
WSH5610DN6A0E				
Full computer name: WSH5610DN6A0E		More		
Member of				
Domain:				
nas.buffalo.local				
O Workgroup:				
WORKGROUP				
	ОК	Cancel		

5 Enter an administrator username and password for the Active Directory domain controller.

Windows S	Windows Security ×				
Compu	uter Name/Doma	ain Changes			
Enter the name and password of an account with permission to join the domain.					
8	User name				
Password					
Domain: nas.buffalo.local					
OK Cancel					

- **6** Click *OK*, then click *OK* again.
- 7 Click Close.
- 8 Click *Restart Now* and restart your computer to apply settings.

Installing DFS

1 From Server Manager, click *Dashboard* > Add roles and features.



2 Click Next.

3 Select "Role-based or feature-based installation" and click *Next*.

📥 Add Roles and Features Wizard		-		×
Select installation	type	DESTI WSH5610DN6A0E.	NATION SER nas.buffalo.i	VER ocal
Before You Begin Installation Type Server Selection Server Roles Features Confirmation Results	 Select the installation type. You can install roles and features on a running machine, or on an offline virtual hard disk (VHD). Role-based or feature-based installation Configure a single server by adding roles, role services, and features. Remote Desktop Services installation Install required role services for Virtual Desktop Infrastructure (VDI) to or session-based desktop deployment. 	g physical compi	uter or virt	ual
	< Previous Next >	Install	Cance	el

4 Click Next.

5 Select "DFS Namespaces" under "File and Storage Services" > "File and iSCSI Services".

elect server rol	es	DESTINATION SERVER WSH5610DN6A0E.nas.buffalo.loca
Before You Begin Installation Type Server Selection	Select one or more roles to install on the selected server. Roles Active Directory Federation Services	Description DFS Namespaces enables you to
Server Roles Features Confirmation Results	Active Directory Lightweight Directory Services DHCP Server DNS Server File and Storage Services (4 of 12 installed) File and iSCSI Services (3 of 11 installed) File Server (Installed) BranchCache for Network Files Data Deduplication	group shared folders located on different servers into one or more logically structured namespaces. Each namespace appears to users a a single shared folder with a series of subfolders. However, the underlying structure of the namespace can consist of numerou
	□FS Namespaces □FS Replication □FS Replication □FIe Server Resource Manager □File Server VSS Agent Service ☑ iSCSI Target Server (Installed) ☑ iSCSI Target Storage Provider (VDS and VSS) □ Server for NFS □ Work Folders ☑ Storage Services (Installed)	shared folders located on different servers and in multiple sites.

6 Select "Include management tools (if applicable)" and click *Add Features*.

Add Roles and Features Wizard
dd features that are required for DFS Namespaces?
e following tools are required to manage this feature, but do no
ave to be installed on the same server.
Remote Server Administration Tools
Role Administration Tools
 File Services Tools
[Tools] DFS Management Tools
7
Include management tools (if applicable)
Add Features Cance

7 Select and "DFS Replication".

Select server role	S	DESTIN/ WSH5610DN6A0E.nz	ATION SERV as.buffalo.lo	ER cal
Before You Begin Installation Type	Select one or more roles to install on the selected server. Roles	Description		
Server Roles Features Confirmation Results	Active Directory Federation Services Active Directory Lightweight Directory Services DHCP Server DNS Server File and Storage Services (4 of 12 installed) File and iSCSI Services (3 of 11 installed) File Server (Installed) BranchCache for Network Files Data Deduplication V DFS Namespaces DFS Replication File Server Resource Manager File Server VSS Agent Service V SS I Sarget Server (Installed) V Storage Services (Installed) Vork Folders V Work Folders Vork Folders V Storage Services (Installed) Hyper-V ✓	replication engine that e to synchronize folders o servers across local or w network (WAN) network connections. It uses the Differential Compression protocol to update only of files that have change last replication. DFS Rep be used in conjunction v Namespaces, or by itself	nables yo nables yo n multiple ide area (RDC) the portic d since th lication ca with DFS	u ie in

8 Click *Next* twice, then click *Install*.

9 Click *Close* to finish.

Creating Namespaces

1 From Server Manager, click *Tools > DFS Management*.



2 Right-click *Namespaces*, then click *New Namespace*.



3 Enter a hostname for the namespace server and click *Next*.

🐴 New Namespace Wizard			-		×
Namespace S	erver				
Steps:	Enter the name of the server that will host the namespace. The server you specify				
Namespace Server	will be known as the namespace server.				
Namespace Name and Settings	Server:				
Namespace Type	WSH5610DN6A0E	Browse			
Review Settings and Create Namespace					
Confirmation					
		< <u>P</u> revious <u>N</u> e	xt >	Cance	ł

4 Enter a name for the namespace and click *Next*.

🐴 New Namespace Wizard		-		×
Namespace N	ame and Settings			
Steps: Namespace Server Namespace Name and Settings	Enter a name for the namespace. This name will appear after the server or domain name in the namespace path, such as \\Server\Name or \\Domain\Name.			
Namespace Type	Public2	1		
Review Settings and Create Namespace Confirmation	Example: Public If necessary, the wizard will create a shared folder on the namespace server. To modify the settings of the shared folder, such as its local path and permissions, click Edit Settings.			
	< Previous Ne	ext >	Cance	a

5 Select *Domain-based namespace* and click *Next*.

🐴 New Namespace Wizard	- • ×	
Namespace Ty	ype	
Steps: Namespace Server Namespace Name and Settings Namespace Type Review Settings and Create Namespace Confirmation	Select the type of namespace to create. Domain-based namespace A domain-based namespace is stored on one or more namespace servers and in Active Directory Domain Services. You can increase the availability of a domain-based namespace by using multiple servers. When created in Windows Server 2008 mode, the namespace supports increased scalability and access-based enumeration. Image: Enable Windows Server 2008 mode Preview of domain-based namespace: \frac{1}{\namesbased namespace \frac{1}{\namesbased namespace Stand-alone namespace Stand-alone namespace is stored on a single namespace server. You can increase the availability of a stand-alone namespace by hosting it on a failover cluster. Preview of stand-alone namespace: \frac{1}{\maximum VSH5610DN6A0E\Public2 	
	< Previous Next > Cancel	

6 Click *Create*.

7 Click *Close* when the New Namespace Wizard finishes.

8 From DFS Management, right-click the name you created through the wizard and click *New Folder*.

🚰 DFS Management				
🗞 File Action View Window Help				
🗢 🏟 🗖 🖬 🗟 🖬				
🐴 DFS Management	Namespaces			
> 2 Namespaces Replication	Name			
	🕹 🔪	New Folder		
		Add Namespace Server		
		Delegate Management Permissions		
		Remove Namespace from Display		
		New Window from Here		
		Delete		
		Refresh		
		Properties		
		Help		

9 Enter a folder name and click *Add*.

				>
Name:				
buffalo-share				
Preview of names	ace:			
\\nas.buffalo.local	\Public2\butta	lo-share		
Folder targets:				
Add	Edit	Remove		
			_	
			OK	Cancel

10 Enter a path to the folder or select from the list by clicking *Browse*. Click *OK*. You may be asked to create a new folder if the selected path doesn't exist. In such a case, click *Yes*.



11 Click *OK* again.

Configuring DFS Replication

1 From Server Manager, click *Tools* > *DFS Management*.

	– 🗆 X
🛛 🕑 🚩 Manage	Tools View Help
	Component Services
	Computer Management
SERVER MANAGER	Defragment and Optimize Drives
	DFS Management
	Disk Cleanup
Configure this loo	Event Viewer
	iSCSI Initiator
2 Add roles and feat	iSNS Server
2 Add Toles and lea	Local Security Policy
	Windows PowerShell
	Windows PowerShell (x86)
	Windows PowerShell ISE
	Windows PowerShell ISE (x86)
	Windows Server Backup

2 Right-click *Replication*, then click *New Replication Group*.

🐴 DFS Managemen	t	
🐴 File Action V	iew Window Help	
🗢 🔿 🔁 📰 🗄	🗟 🔽 📷	
CFS Management	Replication	
> 2 Namespaces Replication	Name	
A	New Replication Group	ter
	Add Replication Groups to Display	
	Delegate Management Permissions	
	Disable Topology Verification	
	View	>
	New Window from Here	
	Refresh	
	Export List	
	Help	

3 Select the group replication type and click *Next*.

🐴 New Replication Group W	lizard	-		×
Replication Gr	oup Type			
Steps:	Select the type of replication group to create.			
Replication Group Type Name and Domain Replication Group Members Topology Selection Hub Members Hub and Spoke Connections Replication Group Schedule and Bandwidth Primary Member Folders to Replicate Review Settings and Create Replication Group Confirmation	 Multipurpose replication group This option configures replication between two or more servers for publication, content sharing, and other scenarios. Replication group for data collection This option configures two-way replication between two servers, such as a branch server and a hub (destination) server. This allows you to collect data at the hub server. You can then use backup software to back up the data on the hub server. 			
	< Previous Nex	t > [Cance	ł

4 Enter a name for the replication group and click *Next*.

🐴 New Replication Group W	Vizard —			Х
Name and Do	main			
Steps:	Type a name and domain for the replication group. The name of the replication group must be unique in the domain that hosts the replication group.			
Replication Group Type				
Name and Domain	Name of replication group:			
Replication Group Members	Buffalo_DFS			
Topology Selection				
Hub Members	Optional description of replication group:			
Hub and Spoke Connections	^			
Replication Group Schedule and Bandwidth	v			
Primary Member	Domain:			
Folders to Replicate	nas.buffalo.local Browse			
Review Settings and Create Replication Group				
Confirmation				
	< Previous Next >]	Cancel	I

5 Click Add.

🐴 New Replication Group W	lizard		-	-		Х
Replication Gr	oup Members					
Steps:	Click Add and then select two	o or more servers that will become members of the				
Replication Group Type	replication group.					
Name and Domain	Members:					
Replication Group Members	Server	Domain				
Topology Selection						
Hub Members						
Hub and Spoke Connections						
Replication Group Schedule and Bandwidth						
Primary Member						
Folders to Replicate						
Review Settings and Create Replication Group						
Confirmation						
	Add Remove					
		< Previous	Next >		Cance	l -

6 Enter more than two servers' hostnames to join the replication group and click *OK*.

Select Computers	×
Select this object type: Computers	Object Types
From this location: nas.buffalo.local	Locations
Enter the object names to select (<u>examples</u>): WSH5610DN6A0E; <u>SERVER-A</u>	Check Names
Advanced OK	Cancel

7 Click Next.

🐴 New Replication Group W	ïzard			-		×
Replication Gr	oup Members					
Steps:	Click Add and then select two	o or more servers that will be	come members of the			
Replication Group Type	replication group.					
Name and Domain	Members:					
Replication Group Members	Server	Domain				
Topology Selection	WSH5610DN6A0E	nas.buffalo.local				
Hub Members	SERVER-A	nas.buffalo.local				
Hub and Spoke Connections						
Replication Group Schedule and Bandwidth						
Primary Member						
Folders to Replicate						
Review Settings and Create Replication Group						
Confirmation						
	Add Remove					
			< Previous Ne	xt >	Cance	el 👘

8 Select "Full mesh" and click *Next*.

🐴 New Replication Group W	lizard	-		\times
Topology Sele	ection			
Steps: Replication Group Type Name and Domain Replication Group Members Topology Selection Replication Group Schedule and Bandwidth Primary Member Folders to Replicate Review Settings and Create Replication Group Confirmation	 Select a topology of connections among members of the replication group. Hub and spoke This topology requires three or more members in the replication group. In this topology, spoke members are connected to one or two hub members. This topology works well in publication scenarios where data originates from the hub member and replicates out to the spoke members. Full mesh In this topology, each member replicates with all other members of the replication group. This topology works well when there are ten or fewer members in the replication group. No topology Select this option if you want to create a custom topology after you finish this wizard. No replication will take place until you create the custom topology. 			
	< Previous Ne	xt >	Cance	əl

Click *Next* again.

🐴 New Replication Group W	fizard	-		×
Replication G	roup Schedule and Bandwidth			
Steps: Replication Group Type Name and Domain Replication Group Members Topology Selection Replication Group Schedule and Bandwidth Primary Member Folders to Replicate Review Settings and Create Replication Group Confirmation	 Select the replication schedule and bandwidth to be used by default for all new connections in the replication group. Replicate continuously using the specified bandwidth Use this option to enable replication 24 hours a day, seven days a week using the following bandwidth: Bandwidth: Ful Pollicate during the specified days and times Replicate during the specified days and times at which replication occurs by default. The initial replication schedule has no replication intervals; you must create at least one replication interval before replication can occur. Edt Schedule			
	< Previous	Next >	Cance	el

Note: You have options to specify the network band and the date and time. To configure bandwidth, select *Replicate continuously using the specified bandwidth* and the bit rate from the drop-down list. To configure the schedule time, select *Replicate during the specified days and times* and click *Edit Schedule*. You can select the date and time in the displayed window.

Select the device as the primary member and click *Next*.

Mew Replication Group W	ver	-		×
Steps: Replication Group Type Name and Domain Replication Group Members Topology Selection Replication Group Schedule and Bandwidth Primary Member Folders to Replicate Review Settings and Create Replication Group Confirmation	Select the server that contains the content you want to replicate to other members. This server is known as the primary member. Primary member: WSH5610DN6A0E If the folders to be replicated already exist on multiple servers, the folders and files on the primary member will be authoritative during initial replication.			
	< Previous Nex	t >	Cance	4

Click Add.

🐴 New Replication Group W	ïzard			-		×
Folders to Rep	blicate					
Steps:	To select a folder on the primar members of the replication grou	y member that you want to rep ip, click Add.	plicate to other			
Replication Group Type						
Name and Domain	Replicated folders:					
Replication Group Members	Local Path	Replicated Folder Name	NTFS Permissions			
Topology Selection						
Replication Group Schedule and Bandwidth						
Primary Member						
Folders to Replicate						
Review Settings and Create Replication Group						
Confirmation						
	Add Edit	Remove				
			< Previous Nex	t >	Cance	el

Select the folder as the replication source and click *OK*.

Add Folder to Replicate	×
Member:	
WSH5610DN6A0E	
Local path of folder to replicate:	
D:\rep_src Browse	
Example: C:\Documents	
Select or type a name to represent this folder on all members of the replication group. This name is known as the replicated folder name. Use name based on path: 	
rep_src	
O Use custom name:	
Example: Documents	
Permissions >> OK Cancel	

Click Next.

🐴 New Replication Group W	ïzard			-		×
Folders to Rep	licate					
Steps:	To select a folder on the primar members of the replication group	y member that you want to re p_click_Add	plicate to other			
Replication Group Type						
Name and Domain	Replicated folders:					
Replication Group Members	Local Path	Replicated Folder Name	NTFS Permissions			
Topology Selection	D:\rep_src	rep_src	Use existing per			
Replication Group Schedule and Bandwidth						
Primary Member						
Folders to Replicate						
Local Path of rep-A on Other Members						
Review Settings and Create Replication Group						
Confirmation						
	Add Edit	Remove				
			< Previous Nex	t>	Cance	el

Click Edit.

🐴 New Replication Group W	lizard						-		\times
Local Path of a	rep-A on	Other N	lembers						
Steps:	To speci select th	fy the local e appropria	path of the replicate	d folder or whether click Edit	the folde	r is read-only,			
Replication Group Type									
Name and Domain	0	'nmary mem	ber:	WSH5	610DN6A	(0E			
Replication Group Members	,	'rimary mem	ber local path:	D:\rep-	A				
Topology Selection	Member	details:							
Replication Group Schedule	Membe	r	Local Path	Membership	p Stat				
and Bandwidth	SERVE	R-A	<not set=""></not>	Disabled					
Primary Member									
Folders to Replicate									
Local Path of rep-A on Other Members									
Review Settings and Create Replication Group									
Confirmation									
	Edit								
									_
				[< Prev	rious Nex	d >	Cance	el

Select "Enabled" and select the folder as the replication destination, then click OK.

Edit	×
General	
Member:	
SERVER-A	
Select the initial status of the replicated folder on this member.	-
Membership status:	
 Disabled The replicated folder will not be stored on this member. 	
Enabled Keep the following folder synchronized with other members.	
Local path of folder:	
D:\rep_dst Browse	
Example: C:\Data	
Make the selected replicated folder on this member read-only.	
OK Cancel	

16 Click Next.

🐴 New Replication Group W	lizard			-		\times
Local Path of r	rep-A on Othe	er Members				
Steps:	To specify the select the appr	local path of the replicated	d folder or whether the folder is read-or click Edit	nly.		
Replication Group Type						
Name and Domain	Primary	member:	WSH5610DN6A0E			
Replication Group Members	Primary	member local path:	D:\rep-A			
Topology Selection	Member details	:				
Replication Group Schedule	Member	Local Path	Membership Stat			
and Bandwidth	SERVER-A	D:\rep_dst	Enabled			
Primary Member						
Folders to Replicate						
Local Path of rep-A on Other Members						
Review Settings and Create Replication Group						
Confirmation						
	Edit					
			< Previous	Next >	Cance	el

Click Create.

🐴 New Replication Group Wi	izard	-		\times
Review Setting	gs and Create Replication Group			
Steps:	You selected the following settings for the new replication group. If the settings are correct, click Create to create the new replication group. To change a setting, click			
Replication Group Type	Previous, or select the appropriate page in the orientation pane.			
Name and Domain				
Replication Group Members	Replication group settings:			
Topology Selection	Replication Group Name: A Buffalo_DFS			
Replication Group Schedule and Bandwidth	Replication Group Description:			
Primary Member				
Folders to Replicate	Domain of Replication Group: nas.buffalo.local			
Local Path of rep-A on Other Members	Replication Group Members (2): WSH5610DN6A0E			
Review Settings and Create Replication Group	SERVER-A			
Confirmation	Topology type: Full mesh			
	List of connections (2): SERVER-A -> WSH5610DN6A0E WSH5610DN6A0E -> SERVER-A			
	Default Connection Schedule: Replicate continuously with Full bandwidth			
	< Previous Crea	ate	Cance	1

Click *Close* when completed.

🐴 New Replication Group W	izard		-		×
Confirmation					
Steps:					
Replication Group Type	You have successfully completed the N	ew Replication Group Wizard.			
Name and Domain	<u> </u>				
Replication Group Members	Tasks Errors				
Topology Selection	Task	Statue			
Replication Group Schedule		Success			
and Bandwidth	Create replication group.	Success			
Primary Member	Set permissions on replicated folders.	Success			
Folders to Replicate	Create replicated folder.	Success			
Local Path of rep-A on Other	Create membership objects.	Success			
Members	Create connections.	Success			
Review Settings and Create Replication Group					
Confirmation					
	I o size the staging folder quota large enou from slowing or stopping, you must take in	ugh to prevent replication to account the size of the			
	files to be replicated. For more information	n, see the staging folder			
	Sector Reserver Sector Res.				
				Close	

Note: >It may take some time before actual replication is caught up. When the following window appears, click *OK*.



Chapter 5 Additional Settings

Changing Server Name, Workgroups, and Domains

1 From Server Manager, click *Local Server*.

ᡖ Server Manager		
Server Mar	nager • Local Ser	ver - 🕲 I 🚩
Dashboard	PROPERTIES For WSH5610DN6A0E	
Local Server	Computer name	WENSEIDDNEADE
All Servers	Workgroup	WORKGROUP
File and Storage Services ▷		
	Windows Firewall	Private: On
	Remote management	Enabled
	Remote Desktop	Enabled
	NIC Teaming	Disabled
	Ethernet	IPv4 address assigned by DHCP, IPv6
	Ethernet 2	Not connected

2 Click the hostname of your TeraStation.

3 From the *Computer Name* tab, click *Change*.

System Properties	>	<
Computer Name Hardwa	are Advanced Remote	
Windows uses on the network	s the following information to identify your computer k.	
Computer description:		
	For example: "IIS Production Server" or "Accounting Server".	
Full computer name:	WSH5610DN6A0E	
Workgroup:	WORKGROUP	
To rename this computer workgroup, click Change	r or change its domain or <u>C</u> hange e.	
	OK Cancel Apply	

4 Enter the computer name, choose domain or workgroup, and click *OK*.

Computer Name/Domain C	Changes	×
You can change the name an computer. Changes might affe	d the membership ct access to netw	of this vork resources.
Computer name:		
Buffalo_sample		
Full computer name: Buffalo_sample		More
Member of		
O Domain:		
Workgroup:		
WORKGROUP		
	ОК	Cancel

Note: The computer name should contain 15 characters or less. If 16 or more characters are entered, all characters from the 16th character on are ignored.

Changing the Password

The default password for the TeraStation's administrator account is "password". This is public knowledge, so for security, you should change it immediately. Follow the procedure below to change the password.

Administrator's Password



4 Enter the current administrator's password and a new password (twice), then press the Enter key.



Passwords for Other Users

1 From Server Manager, click *Tools > Computer Management*.



- **2** Click *Local Users and Groups*, then double-click *Users*.
- **3** Right-click the user whose password will be changed and click *Set Password*.

🔠 Computer Management		
File Action View Help		
🗢 🔿 🖄 🚮 🔀 📾	?	
Computer Management (Local	Name Name	Full Name
Shared Folders	Buffalo_user01	Set Password
 Shared Folders Local Users and Groups 	🕵 Guest	All Tasks >
Groups		Delete Rename
Device Manager		Properties
 Windows Server Backup Disk Management 		Help

4 Click *Proceed*.

_

5 Enter a new password (twice).

Set Password for Buffal	o_user01	?	×
New password:	•••••		
Confirm password:	•••••		
If you click OK, the This user account v files, stored passwo	following will occur: vill immediately lose access ds, and personal security c	to all of its encry ertificates.	/pted
If you click Cancel, the p occur.	assword will not be change	d and no data lo	oss will
	OK Cancel		

Adding a User

1 From Server Manager, click *Tools* > *Computer Management*.

	– 🗆 X		
🛛 🔁 🚩 Manage	Tools View Help		
	Component Services		
SERVER MANAGER	Computer Management		
SERVER MANAGER	Defragment and Optimize Drives		
	DFS Management		
1 Configure this lo	Disk Cleanup		
Conligure this loo	Event Viewer		
	iSCSI Initiator		
2 Add roles and feat	iSNS Server		
	Local Security Policy		
	Windows PowerShell		
	Windows PowerShell (x86)		
	Windows PowerShell ISE		
	Windows PowerShell ISE (x86)		
	Windows Server Backup		

2 Click Local Users and Groups.

3 Right-click *Users* and click *New User*.

🜆 Computer Management		
File Action View Help		
🗢 🄿 🙍 🖬 🔽		
Computer Management (Local	Name	
System Tools De Task Scheduler Seared Folders	Groups	New User
		Refresh
Shared Folders		Help
> 🔊 Performance		

4 Enter the desired settings and click *Create*.

New User				?	×
User name:	Buffa	o_user01			
Full name:					
Description:					
Password:		•••••			
Confirm passw	ord:	•••••			
User must o	hange pa	ssword at ne	xt logon		
	t change	password			
User canno					
User canno	never expir	res			
User canno Password n Account is	never expir disabled	res			
User canno Password n	never expir disabled	es			
User canno	never expir disabled	es			
User canno	disabled	es	Conto		g

5 Click Close.

Connecting with Standard Accounts

Accounts not belonging to the Administrators group cannot connect to Windows Storage Server through the remote desktop. Those accounts must be added to the "Remote Desktop Users" group. Follow the procedure below to add accounts to the group.

1 From Server Manager, click *Tools > Computer Management*.



2 Click *Local Users and Groups*, then double-click *Groups*.

3 Double-click *Remote Desktop Users*.

🔝 Computer Management			- 0	×
File Action View Help				
🗢 🄿 🖄 📷 🗙 🖼 🗟	2 🖬		-	
E Computer Management (Local	Name	Description	Actions	
Computer Management (Local System Tools Task Scheduler Sale Event Viewer Event Viewer Event Viewer Event Viewer Shared Folders Scorage Performance Device Manager Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage Storage S	Name Access Control Assistance Operators Administrators Backup Operators Certificate Service DCOM Access Cryptographic Operators Cryptographic Operators Event Log Readers Guests Hyper-V Administrators IIS_IUSRS Network Configuration Operators Performance Log Users Performance Monitor Users Power Users Power Users Print Operators RDS Endpoint Servers RDS Management Servers RDS Remote Access Servers RDS Remote Access Servers Replicator Replicator Storage Replica Administrators System Managed Accounts Group Users	Description Members of this group can remot Administrators have complete an Backup Operators can override se Members of this group are allowe Members are authorized to perfor Members are authorized to perfor Members are allowed to launch, a Members of this group can read e Guests have the same access as m Members of this group have com Built-in group used by Internet Inf Members of this group can have s Members of this group can have s Members of this group can acces Power Users are included for back Members of this group can acces Power Users are included for back Members in this group can perform Servers in this group can perform Servers in this group are grante Members of this group are grante Members of this group are grante Members of this group are mana Users are prevented from making	Actions Groups More Actions Remote Desktop Users More Actions	* * *

Click *Add*.

Click Advanced.

Click *Find Now*.

7 Select the user to be added as a group member and click *OK*.

Select Users	×
<u>S</u> elect this object type:	
Users or Built-in security principals	Object Types
From this location:	
WSH5610DN6A0E	Locations
Common Queries	
Name: Starts with \checkmark	<u>C</u> olumns
Description: Starts with <	Find <u>N</u> ow
Disa <u>b</u> led accounts	Stop
Non expiring password	
Days since last logon: 🗸 🗸	//
Search res <u>u</u> lts:	OK Cancel
Name	In Folder
🛃 Administrator	WSH5610DN6A
ALL APPLICATION PACKAGES	
ANONYMOUS LOGON	
Authenticated Users	
BATCH	
Buffalo_user01	WSH5610DN6A
Reconsole Logon	
CREATOR OWNER	~

Click *OK*, then click *OK* again.

Adding a Group

1 From Server Manager, click *Tools* > *Computer Management*.



- **2** Click Local Users and Groups.
- **3** Right-click *Groups* and choose *New Group*.



4 Enter a group name and click *Add*.

New Group		7	, ×
Group name:	Buffalo_group01		
Description:			
Members:			
Add	Remove		
Help	Crea	ate	Close

Click Advanced.

Click *Find Now*.
7 Select the users to be registered to the group.

Select Users				×
Select this object type:				
Users or Built-in security principals		<u>O</u> bject	Types	
From this location:				
WSH5610DN6A0E		<u>L</u> ocat	ions	
Common Queries				
N <u>a</u> me: Starts with \vee			<u>C</u> olumns	
Description: Starts with \checkmark			Find <u>N</u> ow	
Disa <u>b</u> led accounts			S <u>t</u> op	
Non expiring password				
Days since last logon: 🔍 🗸			?	
Search res <u>u</u> lts:		ОК	Cancel	
lame	In Folder			1
Administrator	WSH5610DN6A			
ALL APPLICATION PACKAGES				
Authenticated Osers				
BATCH				
Buffalo_user01	WSH5610DN6A			
CONSOLE LOGON				
CREATOR GROUP				
CREATOR OWNER				~

8 Click OK, then click OK again.

- 9 Click Create.
- **10** Click Close.

Enabling Email Notification

Your TeraStation can send you email reports daily, or when settings are changed or an error occurs. Notification emails may be triggered by any of TeraStation reports or Windows event logs.

Configuring Email Server

1 Click the Start button and click *Email Notification*.

2 Select the "Enable email notification" checkbox.

🖫 Email Notification	×
Enable email notification	
Send to	
Email Address	New
	Edit
	Delete
Authentication	
Additionalogical	
SMTP Server Address:	Port Number: 25
User Authentication Method:	None ~
POP Server Address:	Port Number: 110
Usemame:	Password:
SSL/TLS:	Disable
002 120.	
	Accept untrusted or self-signed certificates
Email Settings	
Sender Address:	
Title:	TeraStation Status
	Content Options
Test Message	OK Cancel Apply

3 Click *New* and enter an email address.

4 Enter your email server settings. Click *OK* to finish the email notification settings. You can send a test email when clicking *Test Message*.

5 Enter the password of the user you're logged in as and click *OK*.

Items	Descriptions	
Enable email notification	If enabled, email reports will be sent during specific events.	
Send to	Adds a new receiver for the notification email. Click <i>New</i> to add a new email address. Click <i>Edit</i> to change the receiver settings or <i>Delete</i> to remove an address from the list. Note: Up to five email addresses may be added.	

Items	Descriptions
Authentication	 SMTP Server Address: Enter your email SMTP server's address and port number. Port number 25 is configured by default. Note: If you choose "None" or "POP before SMTP" for the user authorization, the port number is locked to "25". User Authentication Method: Select the user authorization type from "None", "POP before SMTP", "LOGIN (SMTP-AUTH/LOGIN)", and "CRAM-MD5 (SMTP-AUTH/CRAM-MD5)". If "POP before SMTP" is selected, enter the POP server address and port number. Unless the port is specified, the standard port number (110) is used. Username and Password: Enter the username and password of your email server. SSL/TLS: If "LOGIN (SMTP-AUTH/LOGIN)" or "CRAM-MD5 (SMTP-AUTH/LOGIN)" is selected, select whether to use SSL/TLS or STARTTLS.
Email Settings	 Sender Address: Enter the sender's email address for notification emails. Title: Enter the subject of the notification email. Click <i>Content Options</i> to select the event that will trigger the notification emails to be sent.
Test Message	Sends a test email to the email address which is configured.

Specifying TeraStation Reports

A notification email can be sent using TeraStation reports.

- **1** Click the Start button and click *Email Notification*.
- **2** Click Content Options.

3 Click the *Report Settings* tab and select the "Use TeraStation reports to determine notification type" checkbox.

1	Email No	otification					×
F	Report Settings Event ID Settings						
	Use TeraStation reports to determine notification type						
		Select All	Daily Report	🗌 Info	Notice	Error	
		Internal Drive	Off		Off	Off	
	Drives	RAID Volume	Off	Off	Off		
		USB Drive	Off				
		Fan	Off			Off	
		Backup	Off	Off	Off		
	R	eplication			Off		
	Sy	vstem Alert	Off	Off	Off	Off	
					ОК	Cancel	

4 Click On or Off to enable/disable the notifications of the function. When you select the checkboxes to the left of each log level, all notifications of the line will be selected at once.

5 Click *OK*, then click *OK* again.

6 Enter the password of the user you're logged in as and click *OK*.

The notification	emails will be	categorized i	nto the follo	wina import	ance levels.
The nothication	cinians will be	categonizea	neo une romo.	ming import	arree revers.

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

Levels Details	
Error Sends a notifi critical failure	cation email if an error occurs. Error reports will describe any s that prevented a function or TeraStation from operating. It is d to do the corrective action for the error immediately.

Specifying Windows Event Logs

A notification email will be sent when the specified event occurs. This section describes notifications using Windows Update events.



- **2** Click Content Options.
- **3** Click the *Event ID Settings* tab and select the "Use Windows event logs to determine notification type" checkbox.

👻 Email Notifica	ation				×
Report Settings	Event ID Settings				
🗹 Use Windo	ws event logs to de	termine notification t	ype		
Log Level	Log Type	Source	Event ID		New Edit Delete
			[OK	Cancel

4 Click New.

5 Select the importance level from the "Log Level" list.

6 Select "System" from the "Log Type" list.

7 Enter "Microsoft-Windows-WindowsUpdateClient" into the "Source" box.

8 An event ID can be blank. All events triggered by Windows Update will be notified. If you prefer only being notified of specific events, enter those event IDs.

9 Click *OK* three times.

10 Enter the password of the user you're logged in as and click *OK*.

Acquiring Windows Event Logs

To acquire event logs of the TeraStation, follow the procedure below.

1 From Server Manager, click *Tools > Event Viewer*.



2 Double-click *Windows Logs*.

3 Right-click on either "Application", "Security", "Setup", or "System" in the left-side menu to determine the logs to be saved.

4 Click Save All Events As.

5 Specify the desired location and enter a filename, then click *Save*. Do not change the file type.

6 When the "Display Information" screen appears, click *OK*.

The operation to acquire event logs is complete. Open the log file stored in the specified location to check the contents of the event logs.

Chapter 6 Drive Replacement

LEDs

If a drive fails or dismounts, the LED will glow as below. To see the status LEDs, open the front cover.



1 Fail LED

Glows amber if a drive has failed.

2 Status LEDs

The failed drive's status LED will be glowing a steady amber. It also glows when the drive is dismounted. If the volume is fragmented by a drive failure, such as in the case of a 3-drive failure in a RAID 6 volume, the LEDs will glow as above and the "SYSTEM DOWN" message will be displayed on the LCD panel.

Notes:

- For the replacement drive, use a Buffalo OP-HDBN/B series drive. The new drive should be the same size as the replacement drive.
- The TeraStation is fragile. Handle it with care. Do not drop or bump the TeraStation.
- Use caution when handling the TeraStation in order to avoid personal injury.
- Never disassemble any parts while replacing a drive unless instructed to do so in this manual. Any malfunction or damage caused by disassembling the TeraStation will void your warranty.
- To avoid damaging the TeraStation with static electricity, ground yourself by touching something made of metal before handling any sensitive electronic parts.
- Do not change the order of the drives in the TeraStation. For example, pulling out drive 1 and replacing it with drive 2 may cause data to be corrupted or lost.

Drive Replacement Procedure

Follow the procedure below to replace a defective drive.

"ONE DRIVE DOWN" Is Displayed on the LCD Panel

If the "ONE DRIVE DOWN" message is displayed, there is no redundancy for RAID 5 and RAID 10 volumes. It is recommended to replace the defective drive immediately. Back up data before replacing drives. **Note:** The "x" on the LCD panel message is a number of volume type.

1 Open the front cover with the included key.



- **2** Check the status LEDs. The LED for the failed drive glows amber.
- Push the unlock button of the drive whose status LED is glowing amber and swing the locking mechanism out.
 Do not unplug and remove the drives with the status LED lit green. If you do, it may cause data loss or the TeraStation to malfunction.



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



5 Remove the drive from the cartridge.



6 Install a new drive into the cartridge.



7 Replace the four screws.



8 Insert the new drive into the empty slot, slide the drive in with the locking mechanism open, and swing the lock back down until it clicks into the place.



9 Close the front cover with the key.



10 The "RAID-x RECOVERING 0%" message will be displayed on the LCD panel after 3 minutes.



11 When "RAID-x NORMAL" is displayed, drive replacement is finished.



Drive replacement is finished.

"TWO DRIVE DOWN" or "MULTIPLE DOWN" Is Displayed on the LCD Panel

If either the "TWO DRIVE DOWN" message or the "MULTIPLE DOWN" message is displayed, there is no redundancy. It is recommended to replace the defective drive immediately. Back up data before replacing drives.

Note: The "x" on the LCD panel message is a number of volume type.

1 Open the front cover with the included key.



- **2** Check the status LEDs. The LED for the failed drive glows amber.
- Push the unlock button of the drive whose status LED is glowing amber and swing the locking mechanism out.
 Do not unplug and remove the drives with the status LED lit green. If you do, it may cause data loss or the TeraStation to malfunction.



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



5 Remove the drive from the cartridge.



6 Install a new drive into the cartridge.



7 Replace the four screws.



8 Insert the new drive into the empty slots, slide the drive in with the locking mechanism open, and swing the lock back down until it clicks into the place.



9 The "RAID-x RECOVERING 0%" message will be displayed on the LCD panel after 3 minutes.



10 When "RAID-x ONE DRIVE DOWN" is displayed, replacement for a defective drive is finished.



- **11** Push the rest of the failed drive's unlock button and swing the locking mechanism out.
- 12 Insert the new drive into the empty slot, slide the drive in with the locking mechanism open, and swing the lock back down until it clicks into the place.
- **13** Close the front cover with the key.



14 The "RAID-x RECOVERING 0%" message will be displayed on the LCD panel after 3 minutes.

RAID-x RECOVERING 0%

15 When "RAID-x NORMAL" is displayed, drive replacement is finished.

RAID-x	
NORMAL	

<u>"SYSTEM DOWN" Is Displayed on the LCD Panel</u></u>

When the "SYSTEM DOWN" message is displayed, data on the TeraStation has already been lost. The issue occurs on the drive so the operating system may become unstable. It is recommended to replace the defective drive immediately. Back up data before replacing drives.

For Striped Volume:

- **1** Turn off the TeraStation. It may take some time until the shutdown process completes.
- **2** Turn the TeraStation on while holding down the mode button.
- **3** When "RAID-0 NORMAL" is displayed, you can proceed. If "SYSTEM DOWN" is still displayed, go to the next step to replace the defective drive.
- **4** Open the front cover with the included key.



5 Check the status LEDs. The LED for the failed drive glows amber.

6 Push the unlock button of the drive whose status LED is glowing amber and swing the locking mechanism out.

Do not unplug and remove the drives with the status LED lit green. If you do, it may cause data loss or the TeraStation to malfunction.



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



8 Remove the drive from the cartridge.



9 Install a new drive into the cartridge.



10 Replace the four screws.



11 Insert the new drive into the empty slots, slide the drive in with the locking mechanism open, and swing the lock back down until it clicks into the place.



12 Close the front cover with the key.



13 Turn the TeraStation off first, then turn it on while holding down the mode button.

14 "RAID-0 NORMAL" will be displayed on the LCD panel.

RAID-0 NORMAL

15 Create a volume by referring to the "Creating a Volume" section in chapter 3.

For RAID 6 or RAID 10 Volumes:

- **1** Open the front cover with the included key.
- **2** Check the status LEDs. The LED for the failed drive glows amber.
- **3** Pull out two drive cartridges whose status LED glow amber and remove them from the TeraStation. Leave the drives whose status LEDs blink amber in the TeraStation.

Do not unplug and remove the drives with the status LED lit green. If you do, it may cause data loss or the TeraStation to malfunction.

4 Turn off the TeraStation. It may take some time until the shutdown process completes.

5 Turn on the TeraStation while holding down the mode button with the drives left removed.

6 When either the "RAID-x TWO DRIVE DOWN" message or the "MULTIPLE DOWN" message is displayed, replace the defective drive by referring to the ""TWO DRIVE DOWN" or "MULTIPLE DOWN" Is Displayed on the LCD Panel" section above.

If "SYSTEM DOWN" is still displayed, go to the next step to replace more defective drives.

7 Pull out other defective drive cartridges whose status LED glows amber and remove them from the TeraStation.

8 Remove drives from the cartridges and install new drives in them.

9 Insert the new drive into all empty slots, slide the drive in with the locking mechanism open, and swing the lock back down until it clicks into the place.

10 Close the front cover with the key.

11 Turn the TeraStation off, then turn it on while holding down the mode button.

12 "RAID-x NORMAL" will be displayed on the LCD panel.



If either "RAID-x ONE DRIVE DOWN", "RAID-x TWO DRIVE DOWN", or "SYSTEM DOWN" messages are displayed, try the procedure described in each section above.

13 Create a volume by referring to the "Creating a Volume" section in chapter 3.

For RAID 5 Volume:

1 Open the front cover with the included key.

- **2** Check the status LEDs. The LED for the failed drive glows amber.
- **3** Pull out one drive cartridge whose status LED glow amber and remove them from the TeraStation. Leave the drives whose status LEDs blink amber in the TeraStation.

Do not unplug and remove the drives with the status LED lit green. If you do, it may cause data loss or the TeraStation to malfunction.

4 Turn off the TeraStation. It may take some time until the shutdown process completes.

5 Turn on the TeraStation while holding down the mode button with the drives left removed.

6 When the "RAID-5 ONE DRIVE DOWN" message is displayed, replace the defective drive by referring to the ""ONE DRIVE DOWN" Is Displayed on the LCD Panel" section above.

If "SYSTEM DOWN" is still displayed, go to the next step to replace the defective drive.

7 Remove another defective drive cartridge whose status LED glows amber from the TeraStation.

8 Remove drives from the cartridges and install new drives in them.

9 Insert the new drive into all empty slots, slide the drive in with the locking mechanism open, and swing the lock back down until it clicks into the place.

10 Close the front cover with the key.

11 Turn the TeraStation off, then turn it on while holding down the mode button.

12 "RAID-5 NORMAL" will be displayed on the LCD panel.

RAID-5	
NORMAL	

If "RAID-5 ONE DRIVE DOWN" or "SYSTEM DOWN" is displayed, try the procedure described in the each section above.

13 Create a volume by referring to the "Creating a Volume" section in chapter 3.

Replacing a Non-Malfunctioning Drive

Do not replace a drive that is not malfunctioning.

If you must change a drive that is not malfunctioning, shut down the TeraStation before replacing the drive. If you need to replace more than one drive at the same time, replace the drives one at a time to preserve your data. When replacing the non-malfunctioning drive, follow the procedures below:

Operating in Striped Volume

All data on the volume will be deleted after replacing the drive. You will not be able to use the TeraStation until the drive has been replaced. Refer to the ""SYSTEM DOWN" Is Displayed on the LCD Panel" section above for the procedure.

Operating in a Redundant Volume Other Than Striped Volume

If you are using a redundant volume such as RAID 5 or 6, the volume will be in degraded mode after replacing the drive. You need to recover from degraded mode by replacing the drive. Refer to the ""ONE DRIVE DOWN" Is Displayed on the LCD Panel" section above for the procedure.

Chapter 7 l	Jtilities
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NAS Navigator2 for Windows

NAS Navigator2 is a utility program that makes it easy to display Windows Storage Server, change the TeraStation's IP address, or check its drive in remote desktop. To install NAS Navigator2, download the installer from http://d.buffalo.jp/WSH5010N6/.

Double-click the NAS Navigator2 icon (O) to start NAS Navigator2.

NAS Navigator2		- 🗆 ×
🎦 Menu 👻 🏭 View 👻	G Refresh	
WSH5610DN6A0 E		
WSH5610DN6 Series	C 141 (P/59.0 (P /22.0%)	Workgroup: WORKGROUP
	D: 0.4 GB/7451 9 GB (0.0%)	Subnet Mask: 255.255.25.0
	0. 0.4 36/1451.9 36 (0.0%)	Default Gateway: 192.168.10.1
		MAC Address: GG:HH:IEU:KK:LL
		Firmware: 3.10
		NAS Navigator version 2.92

Click a TeraStation's icon to display total capacity, used capacity, workgroup name, IP address, subnet mask, default gateway, MAC address, and firmware version.

Double-click the icon to open a shared folder on the TeraStation.

Name		Description		
Menu	Map All Remote Shares to Drive Letters	Assigns all Buffalo NAS devices' shared folders as network drives. This is available only when a shared folder has been created.		
	Create Desktop Shortcut*	Creates a desktop shortcut to the Buffalo NAS device's shared folders.		
	Launch NAS Navigator2 on Startup	Launches NAS Navigator2 in the system tray when Windows boots.		
	Display Errors	If an error occurs, an error message will appear from the NAS Navigator2 icon in the system tray.		
	Properties*	Opens the properties page that lets you configure the Buffalo NAS device's IP address or open Windows Storage Server in remote desktop.		
	Close	Closes NAS Navigator2.		

Name		Description				
	View	Icons: Displays icons. Details: Displays the hostname, product name, workgroup, IP address, subnet mask, and default gateway.				
View	Sort by	If you have multiple Buffalo NAS devices on the network, you may choose to display them in order of hostname, product name, workgroup, IP address, subnet mask, or default gateway.				
Browse*		Opens the Buffalo NAS device's shared folders.				
Refresh		Searches for the Buffalo NAS devices on the network again.				
	Browse Shares	Opens the Buffalo NAS device's shared folders.				
	Open Remote Desktop	Opens Windows Storage Server in remote desktop.				
Right-click your device's icon to show these menus.	Properties	Opens the properties page that lets you configure the Buffalo NAS device's IP address or open Windows Storage Server in remote desktop.				
	Create Desktop Shortcut	Creates a desktop shortcut to the Buffalo NAS device's shared folders.				

*Click on the Buffalo NAS device's icon to display these options.

When NAS Navigator2 is closed, right-click the NAS Navigator2 icon in the system tray for the following options.

Browse Shares	WSH5610DN6A0E >				
Open Remote Desktop	Refresh				
Properties	Open NAS Navigator2				
Create Shortcut	Exit				

Name		Description		
Buffalo NAS device name	Browse Shares	Opens the Buffalo NAS device's shared folders.		
	Open Remote Desktop	Opens Windows Storage Server in remote desktop.		
	Properties	Opens the properties page that lets you configure the Buffalo NAS device's IP address or open Windows Storage Server in remote desktop.		
	Create Shortcut	Creates a desktop shortcut to the Buffalo NAS device's shared folders.		
Refresh		Searches for the Buffalo NAS devices on the network again.		
Open NAS Navigator2		Opens the NAS Navigator2 window.		
Exit		Exits NAS Navigator2.		

The following tasks may be performed from the Buffalo NAS device's properties page.

WSH5610DN6A0E Properties	×
WSH5610DN6 Series	
Remote Desktop IP Address	
Open Remote Desktop Open Remote Desktop	
OK Cancel Ap	ply

Name	Description
Remote Desktop	Click Open Remote Desktop to open Windows Storage Server.
IP Address	Select the "Use DHCP" checkbox to assign an IP address from the DHCP server automatically. If there is no DHCP server on the network, you cannot use this function. Select the "Renew IP address" checkbox to obtain an IP address from the DHCP server. You can manually enter a static IP address, subnet mask, and default gateway.

Changing the IP Address

- **1** Double-click the NAS Navigator2 icon () to start NAS Navigator2.
- **2** Right-click your TeraStation's icon and select *Properties* > *IP Address*.
- **3** Clear the "Use DHCP" checkbox and enter the desired settings, then click *OK*. If the username and password prompt appears, enter the admin username and password.

NAS Navigator2 for macOS

NAS Navigator2 is a utility program that makes it easy to display Windows Storage Server, change the TeraStation's IP address, or check its drive in remote desktop. To install NAS Navigator2, download the installer from http://d.buffalo.jp/WSH5010N6/.

Click the NAS Navigator2 icon (O) in the Dock to start NAS Navigator2.

😑 🕒 NAS Na	vigator2
😑 🕹 🗦 📰 🗮 🌞	Y
Open Refresh I'm here	
WSH5610DN6A0E	
	0
SHEETODNEADE	Watersus : WORKCOOLD
WSH56 TODING Series	IP Address : 192.168.10.29
C: 14.1 GB / 58.9 GB (23.9	Subnet Mask : 255.255.255.0
D: 0.4 GB / 7451.9 GB (0.0	Default Gateway : 192.168.10.1
	MAC Address : GG:HH:II: LI:KK!II
	MAG Address - GOTTITITES. ALEE
	Firmware : 3.10

Click a TeraStation's icon to display total capacity, used capacity, workgroup name, IP address, subnet mask, default gateway, MAC address, and firmware version.

Double-click the icon to open a shared folder on the TeraStation.

Name		Description		
Open		Opens the Buffalo NAS device's shared folders.		
Refresh		Searches for the Buffalo NAS devices on the network		
		again.		
Open Remote Desktop		Opens Windows Storage Server in remote desktop.		
		Opens the properties page that lets you configure		
Configure		the Buffalo NAS device's IP address or open Windows		
		Storage Server in remote desktop.		
Label Color		Selects the color of the name displayed below the icon.		
View Options		Lets you choose icon size, position, and view mode.		
Auto Power Mode		Auto power mode can turn supported Buffalo NAS		
		devices on the network on and off automatically.		
	Open Folder	Opens the Buffalo NAS device's shared folders.		
To display these options, hold down the control key and click your device's icon.	Open Remote Desktop	Opens Windows Storage Server in remote desktop.		
		Opens the properties page that lets you configure		
	Configure	the Buffalo NAS device's IP address or open Windows		
		Storage Server in remote desktop.		
	Label Color	Selects the color of the name displayed below the icon.		

The following tasks may be performed from the Buffalo NAS device's properties page.

•	0				NAS	S Navig	ator2				
l		WSH5610D WSH5610DN	N6A0E 6 Series	Remo	ote De	sktop	IP Addre	SS)		
	Us IP Add Subne Defau	e DHCP Renew IP ad dress: et Mask: It Gateway:	dress 0	0	0	0					
Ad	dministra	ator Usernan	ne								
Ad	dministr	ator Passwor	d						Cancel	Apply	

Name	Description
Remote Desktop	Click Open Remote Desktop to open Windows Storage Server.
IP Address	Select the "Use DHCP" checkbox to assign an IP address from the DHCP server automatically. If there is no DHCP server on the network, you cannot use this function. Select the "Renew IP address" checkbox to obtain an IP address from the DHCP server. You can manually enter a static IP address, subnet mask, and default gateway.

Changing the IP Address

- 1 Click the NAS Navigator2 icon () in the Dock to start NAS Navigator2.
- **2** Click the TeraStation icon while holding down the control key, then select *Configure* > *IP Address*.
- **3** Clear the "Use DHCP" checkbox; enter the desired settings and the administrator password, then click *Apply*.

NovaBACKUP

NovaBACKUP is a Windows utility that lets you back up data on your computer.

The NovaBACKUP installer is available from http://d.buffalo.jp/WSH5010N6/. Select the region and model to go to your specific model's d.buffalo website. Download the NovaBACKUP installer and install it onto your computer. To download the installer, you will need the serial number of your TeraStation. The serial number is printed on the label on the back of the unit.

Chapter 8 Troubleshooting

While using the TeraStation, you may lose 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.

The TeraStation Becomes Unaccessible

Common causes of typical issues that may occur, including if you are unable to search using NAS Navigator2 or the remote desktop screen does not open, are described below.

Cause 1. The cables are not connected correctly:

The cables are not physically connected, or there may be a contact defect. Reconnect the AC cable and Ethernet cable and restart both the computer and TeraStation.

Cause 2. Security software in the background is blocking communication:

Add an exception to your firewall software, or disable the firewall software completely. Turn off any software security suite that might include a firewall. Try searching again.

Cause 3. Wireless and wired adapters are both enabled:

Disable all adapters except for the Ethernet adapter connected to the TeraStation.

Cause 4. The Ethernet cable is defective, or the connection is unstable:

Try changing the hub port or Ethernet cable that you used to connect.

Cause 5. The LAN board, card, or adapter that you are using is defective:

Try changing the LAN board, card, or adapter.

Cause 6. The duplex mode of the network adapter or hub has not been set:

Select either "10M half-duplex" or "100M half-duplex" for the duplex mode of the network adapter or hub. Some network adapters may be unable to connect the network correctly when the duplex mode is set to auto negotiation.

Cause 7. A network bridge is installed:

If the network has a network bridge that is not being used, remove it.

Cause 8. You are searching from a different network:

You cannot conduct searches beyond your local network subnet. Connect the TeraStation to the same network subnet as the computer performing the search.

Cause 9. TCP/IP is not operating correctly:

Reinstall the LAN adapter drivers.

Cause 10. Remote desktop connection software is not installed on your Mac:

If using macOS, download and install "Microsoft Remote Desktop" from the Mac App Store.

Shared Folders Suddenly Do Not Open

If the TeraStation shared folder is assigned and used as a network drive, the TeraStation may suddenly become inaccessible if network settings such as IP addresses or groups are changed. If this happens, open NAS Navigator2 and double-click your TeraStation icon to access a shared folder.

Unable to Access the Shared Folder or the System Becomes Unstable

This usually happens because too many software applications are running on Windows Storage Server, causing a memory shortage. Exit or uninstall some of the software running on Windows Storage Server, then restart the TeraStation.

Drive Status Cannot Be Found

If the language settings are not the same for the following options, the drive status such as error, resynchronization, or degraded may not be detected correctly. Configure the same language for these options.

- Display language
- Welcome screen and system account
- System locale

LCD Panel Displays a Different IP Address

The IP address displayed when pressing the select button is for maintenance use only and this is not the IP address of the TeraStation.

Resynchronization Regressed When TeraStation Was Restarted While Resynchronizing

If you restart the TeraStation while resynchronizing, the resynchronization temporarily halts and will resume after the reboot completes. The ones place digit of the progress display will be reset to "0".

For example, if rebooted when resynchronizing has proceeded to 15%, the progress status after restarting will be 10%.

TeraStation Does Not Boot

If Windows Storage Server no longer functions properly, perform recovery using the supplied SD card. This recovery procedure erases your data. Backing up regularly is highly recommended to avoid losing your important data.

Notice Before Recovery

• Do not connect the SD card to another TeraStation or your computer. The recovery process that involves using this SD card is intended for this product only.

- If the storage pool is created on drive 1, delete the storage pool before running the recovery process.
- Remove all USB devices except for the supplied SD card, a card reader, a mouse, and keyboard before recovering. When it's completed, you can connect them back to the TeraStation.

Recovering Windows Storage Server

- **1** Turn off the TeraStation, following the procedure on the "Turning the TeraStation On and Off" section in chapter 1.
- **2** Insert the SD card into the card reader (not included).
- **3** Connect a mouse, keyboard, and the card reader to the TeraStation using a USB 3.0 or 2.0 port.
- **4** Connect the monitor to the TeraStation using a HDMI or VGA port.
- **5** Press the power button to turn the TeraStation on.
- **6** Press the F11 key some times until the "Please select boot device:" is displayed. When it's displayed, stop pressing F11. If it not displayed, repeat from the step 1.
- **7** Press the Down Arrow key and select the SD card beginning from "UEFI:", then press the Enter key.
- 8 The recovery process proceeds automatically.
- **9** When the recovery process finishes, the TeraStation shuts down automatically.
- **10** Turn on the TeraStation. If it boots up properly, recovery is completed.

Chapter 9 Appendix

Default Settings

Administrator's Name	Administrator	
Password	password	
Shared Folders	Drives C and D are configured as administrative hidden shares by Windows Storage Server's default settings.	
IP Address	The TeraStation will get its IP address automatically from a DHCP server on the network. If no DHCP server is available, then an IP address will be assigned as follows: IP Address: 169.254.xxx.xxx ("xxx" is assigned randomly when booting the TeraStation.) Subnet Mask: 255.255.0.0	
Registered Groups	Windows Storage Server's default groups are registered.	
Microsoft Network Group Setting	WORKGROUP	
Volume Type	RAID 6 volume	
Local Security Policy	"Password must meet complexity requirements" is disabled by default.	

Note: The Windows settings on this TeraStation have been customized for best performance so that the power options settings can be left alone as recommended.

The TeraStation has the following functions and roles:

Features:

.NET Framework 4.7, iSNS Server, Windows PowerShell 5.1, WoW64 Support etc.

Roles:

File and Storage Services

Note: For other installed roles and features, see "Roles and Features", which you can reach by clicking "Local Server" on the left side menu in "Server Manager".

Errors on the LCD Panel

The TeraStation indicates errors on the LCD panel. The LCD panel can help you troubleshoot problems. Refer to the "Diagrams" section in chapter 1 to locate where the LCD panel is.

If an error occurs, the TeraStation will beep. You can stop the beeping by pressing the mode button.

Note: The "x" on the LCD panel message is a number of volume type.

Error Messages

LCD Panel	Corrective Action
RAID-x ONE DRIVE DOWN	One drive failed. Check the LED in front for the defective drive. Refer to chapter 6, "Drive Replacement", and replace the failed drive with a new drive. You can stop the beeping by pressing the mode button.

LCD Panel	Corrective Action	
RAID-x TWO DRIVE DOWN	Two drives failed. Check the LED in front for the defective drive. Refer to chapter 6, "Drive Replacement", and replace the failed drive with a new drive. You can stop the beeping by pressing the mode button.	
MULTIPLE DOWN	Two or three drives failed. Check the LED in front for the defective drive. Refer to chapter 6, "Drive Replacement", and replace the failed drive with a new drive. You can stop the beeping by pressing the mode button.	
SYSTEM DOWN	Three or more drives failed. Check the LED in front for the defective drive. Refer to chapter 6, "Drive Replacement", and replace the failed drive with a new drive. You can stop the beeping by pressing the mode button.	
Code ROM Error System Halted	Program ROM cannot be read. Shut off the TeraStation, wait 10 seconds, then turn it back on. If the error still remains, contact Buffalo technical support.	
Work RAM Error System Halted	A work memory error occurred on the array controller. Shut off the TeraStation, wait 10 seconds, then turn it back on. If the error still remains, contact Buffalo technical support.	
Dispatch Nesting Error		
Divide or FPP or Invalid Code Err		
System INTERRUPT Error		
System SBI INT Occur		
System RIE INT:0x000		
System AE INT:0x000	Internal error. The TeraStation cannot be accessed. Contact Buffalo technical support.	
System TRAP Error		
Buffer Manager Queue Error		
Cache Buffer Error 0x#######		
Buffer Size Error		
Buffer Manager Link Error		

Characters Added When "ONE DRIVE DOWN" or "SYSTEM DOWN" Occurs

When "ONE DRIVE DOWN" or "SYSTEM DOWN" is displayed on the LCD panel, one of the following characters will also be displayed. Refer to the chart below for more detailed information about the error that occurred.

For Hardware Errors

r		Replace the drive by referring to chapter 6, "Drive Replacement".
А		
В		
С		
D		
E		
I		
М		
Ν		
0	The drives may be malfunctioning.	
р		
R		
S		
Т		
Y	-	
Z		
Z		
L		
W		
X	Drive disconnected.	Reconnect the drive.

Note: If "S", "Z", or "z" is displayed, the drives may be malfunctioning. Contact Buffalo technical support while keeping the TeraStation power on.

For Software Errors

U	- The drives may be malfunctioning.	Replace the drive by referring to chapter 6,
E		"Drive Replacement".

Specifications

Check the Buffalo website for information about the latest products and specifications.				
Installed System	Microsoft Windows Storage Server 2016 Standard Edition Note: The Microsoft Software License is on the d.buffalo website, http://d.buffalo.jp/WSH5010N6/. Be sure to read the terms and conditions of this license.			
	Standards Compliance	IEEE 802.3ab (1000BASE-T), IEEE 802.3u (100BASE- TX), IEEE 802.3 (10BASE-T)		
LAN Interface	Data Transfer Rates	10/100/1000 Mbps (auto sensing)		
	Number of Ports	2		
	Connector Type	RJ-45 8-pin (auto MDI-X)		

	Standards Compliance	USB 3.0/2.0
USB Interface	Data Transfer Rates	USB 3.0: max. 5 Gbps USB 2.0: max. 480 Mbps
	Number of Ports	2 x USB 2.0, 1 x USB 3.0
	Connector Type	Туре А
Other Interfaces	1 x eSATA port, 1 x HDMI port, 1 x VGA port, 1 x D-sub 9 pin (male) port	
	Number of Drive Bays	6
	Drive Interface	SATA 3 Gbps
	Supported Volume Types	RAID 0/10/5/6
Internal Hard Drives	Replacement Drive	Buffalo OP-HDBN/B series drive Note: The new drive should be the same size as the replacement drive. The drives listed above are available from the Buffalo website.
	Power Supply	AC 100–240 V, 3.0 A, 50/60 Hz
	Dimensions (W x H x D, excluding protruding parts)	170 x 260 x 230 mm; 6.7 x 10.2 x 9.1 in
	Weight	9.0 kg; 19.8 lb
	Power Consumption	Max. 120 W
Other	Operating Environment	Temperature: 5–35°C; 41–95°F Humidity: 20–80% non-condensing
	Compatible Devices	Windows PCs, tablets, and Mac computers with wired or wireless Ethernet connection. Note: The TeraStation requires an Ethernet connection with your computer for operation. The TeraStation cannot connect via USB.
	Supported OS	Windows 10, 8.1, 7 Windows Server 2016, 2012 R2, 2012, 2008 R2, 2008 macOS 10.13, 10.12, 10.11