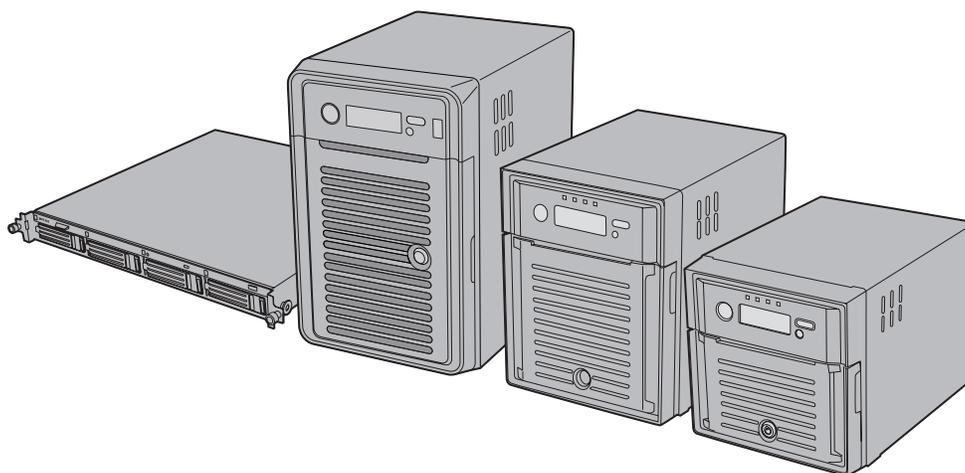


TeraStation WSS 5000

## **User Manual**



***Americas: [www.buffaloamericas.com](http://www.buffaloamericas.com)***

***Europe: [www.buffalo-technology.com](http://www.buffalo-technology.com)***

***Asia Pacific: [www.buffalo-asia.com](http://www.buffalo-asia.com)***

35020065-07  
2014.12

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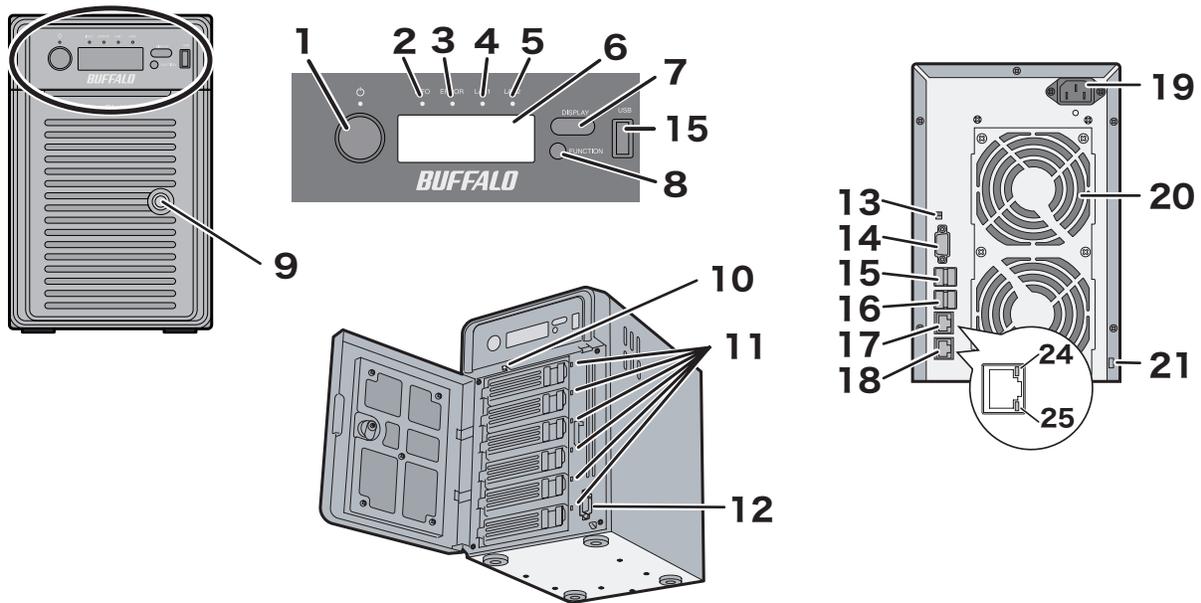
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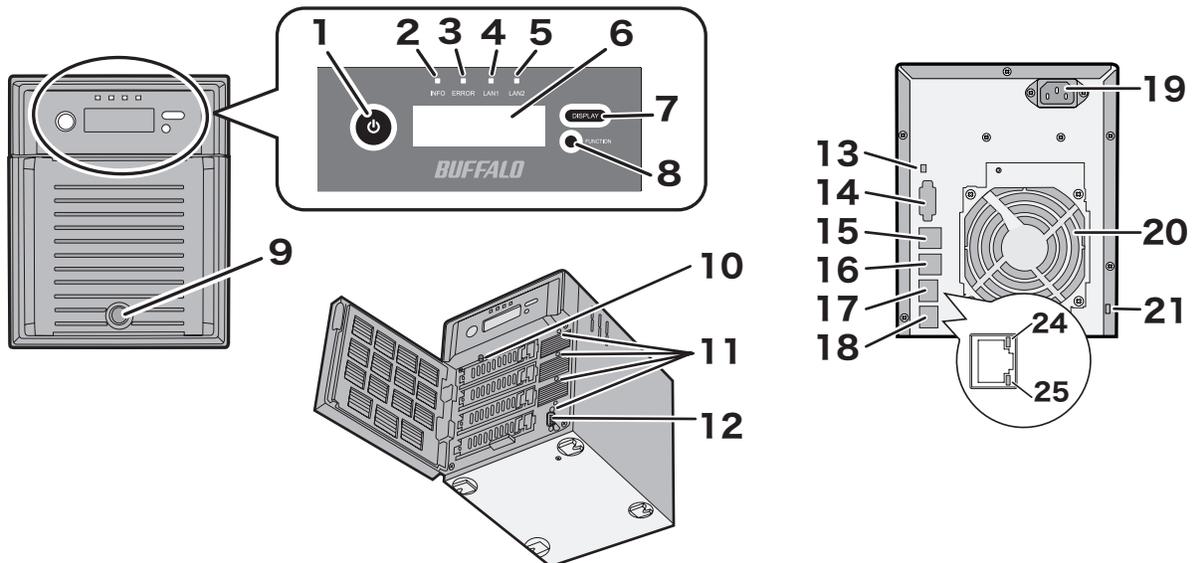
# Chapter 1 Installation

## Diagrams

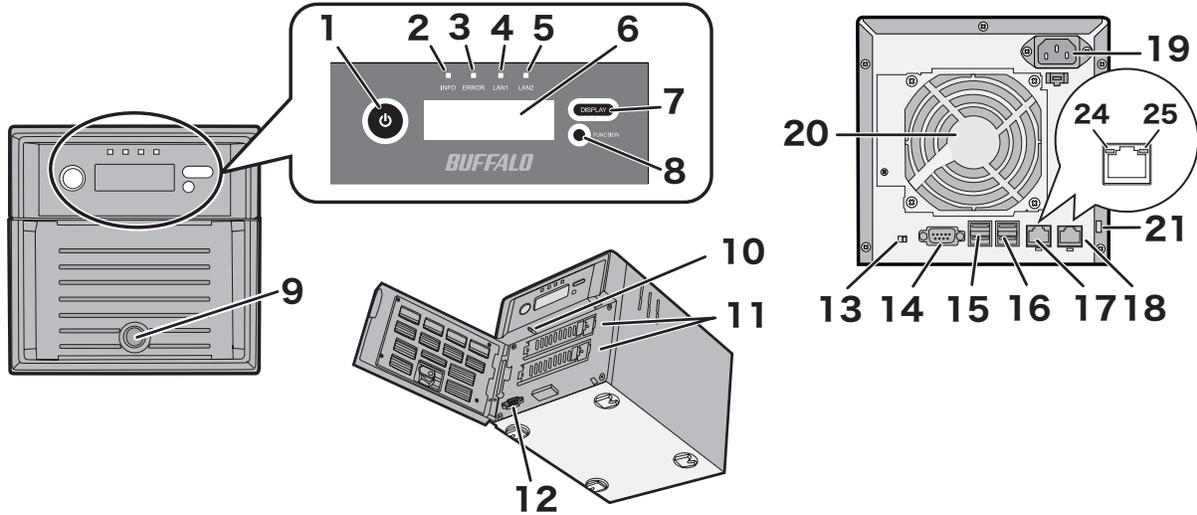
### WS5600D



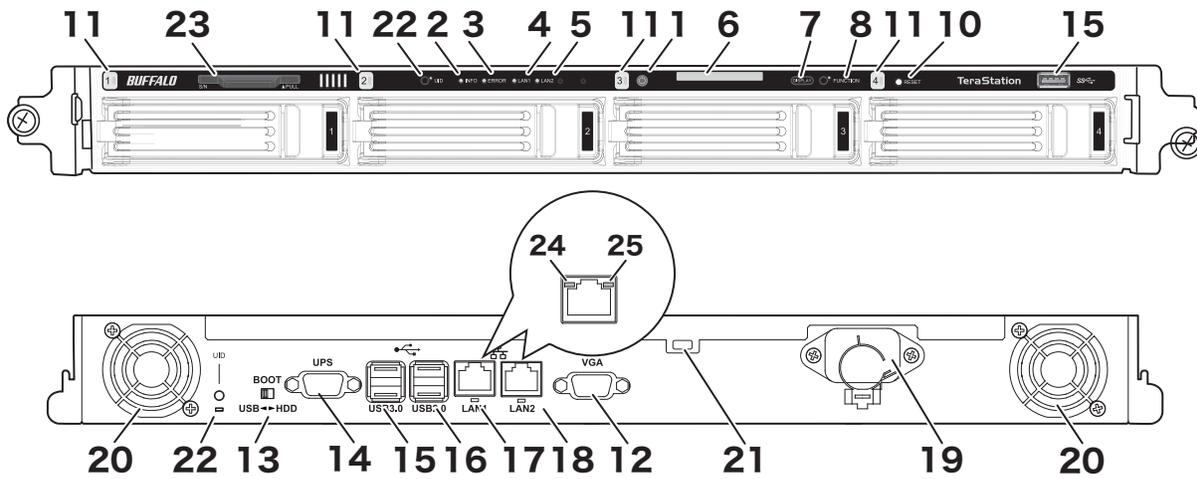
### WS5400D



## WS5200D



## WS5400R



### 1 Power Button

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

### 2 Info LED

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

### 3 Error LED

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

### 4 LAN1 LED

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

### 5 LAN2 LED

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

### 6 LCD Panel

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

## **7 Display Button**

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

## **8 Factory Use Only**

## **9 Drive Lock**

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

## **10 Reset Button**

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

## **11 Status LEDs**

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

## **12 VGA Connector**

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.

## **13 Boot Mode Switch**

Leave the switch in the HDD position during normal operation. To recover settings, insert the recovery USB drive into a USB 3.0 or 2.0 port, move the boot switch to the USB position, and press the power button.

## **14 UPS Port**

Connect to a UPS.

## **15 USB 3.0 Port**

Compatible Buffalo USB 3.0 hard drives, USB flash drives, digital cameras, and USB UPSs can be connected. USB hubs are not supported.

## **16 USB 2.0 Port**

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

## **17 LAN Port 1**

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

## **18 LAN Port 2**

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

## **19 Power Connector**

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

## **20 Fan**

Do not block the fan.

## **21 Anti-Theft Security Slot**

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

## 22 UID Button

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

## 23 Serial Number

This sticker shows the TeraStation's serial number.

## 24 Link LED

Glow orange when the unit is connected to a network.

## 25 Act LED

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

---

# Installation

---

**Note:** If using OS X (10.4 or later), download and install "Remote Desktop Connection Client for Mac 2" from <http://www.microsoft.com>. For OS X 10.3.9, use version 1.0.3 instead.

- 1 Connect the TeraStation's Ethernet and power cables and turn it on.
- 2 Insert the supplied microSD card into your computer. Open the "TeraNavi" folder and double-click *TSNavi.exe* to launch TeraNavigator. You can also download the latest version of TeraNavigator from Buffalo's website.

### Notes:

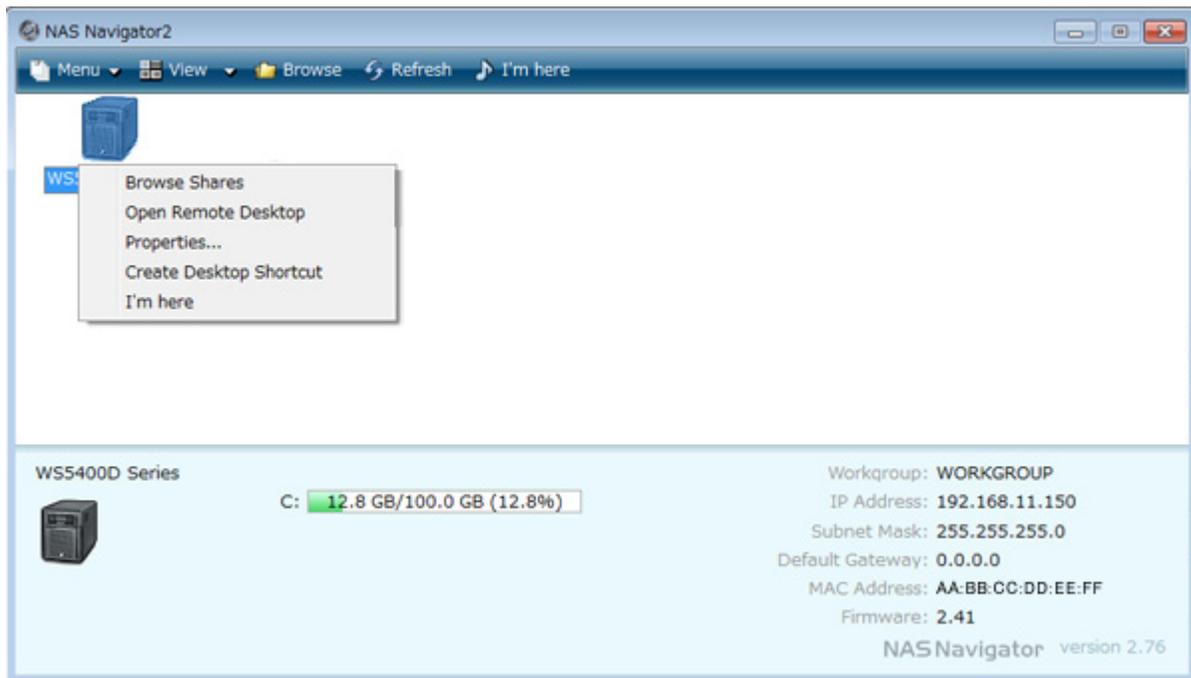
- If using Windows 2000 or 2000 Server, make sure that write-protection on the USB device is disabled before connecting it. To disable write-protection, slide the switch on the USB device toward the USB connector.
- If "Do you want to allow the following program to make changes to this computer?" is displayed by Windows 8.1, Windows 8, or Windows 7, click *Yes*. If "A program needs your permission to continue" is displayed by Windows Vista, click *Continue*.
- With Mac OS, double-click the disk image "WS5000-XXX.dmg" (where "XXX" is the software version) from the USB device and double-click *TeraNavigator*.
- Disable your antivirus software firewall before continuing. You may not be able to install Buffalo software if antivirus software or a software firewall are enabled. After you've finished setup, re-enable your firewall or antivirus software.

- 3 Click *Begin Installation*. The wizard will guide you through installing NAS Navigator2.

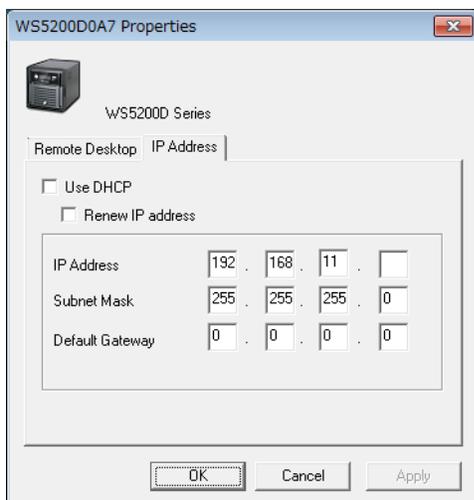


- 4 Click *Finish*. NAS Navigator2 will open.

- 5 Right-click on your TeraStation's icon, then select *Properties*. On a Mac, click the TeraStation's icon while holding down the control key, then select *Configure*.



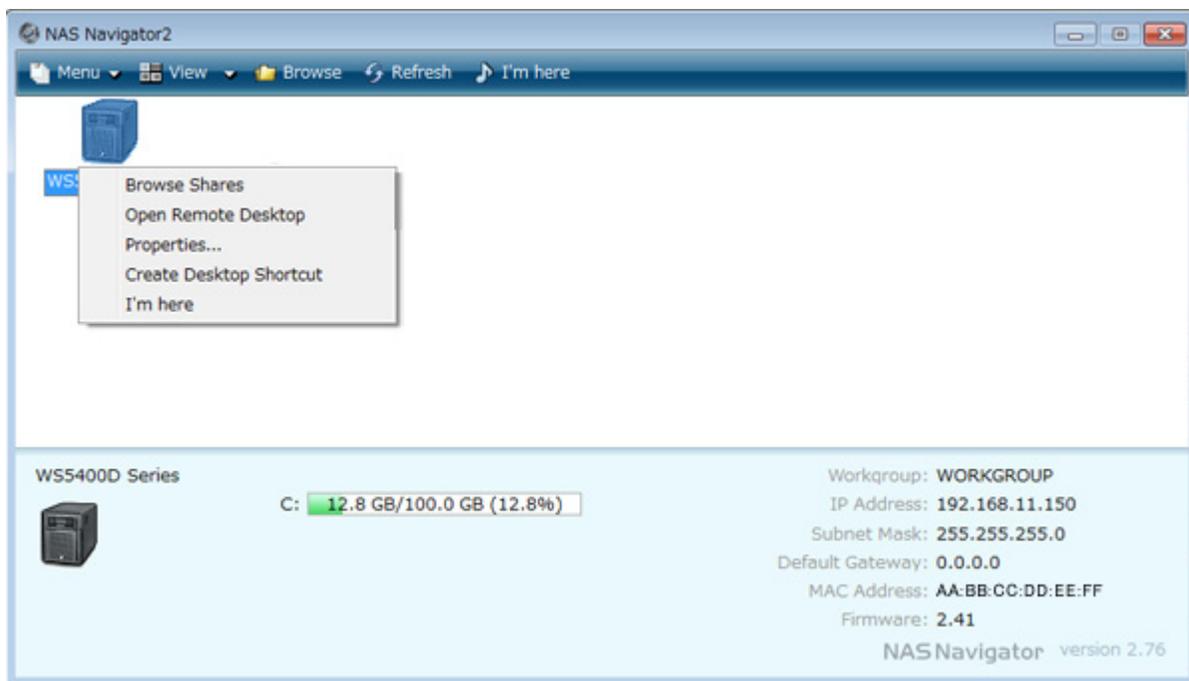
- 6 Select the *IP Address* tab and check "Use DHCP" (or enter the IP address settings manually). Click *OK*.



If you are prompted to enter the administrator password for the TeraStation, it is "password" by default.

**Note:** If you change the IP address manually, change the DNS settings in Windows Storage Server also.

- 7 Right-click on your TeraStation's icon and choose *Open Remote Desktop*. On a Mac, click the TeraStation's icon while holding down the control key, then select *Open Remote Desktop*.



**Notes:**

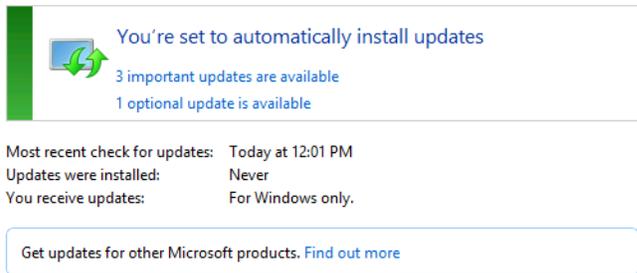
- If the message "The publisher of this remote connection cannot be identified. Do you want to connect anyway?" is displayed, click *Connect*.
- If "The identity of the remote computer cannot be verified. Do you want to connect anyway?" is displayed, click *Yes* or *Continue*.

- 8 Enter the username and password, then press the Enter key.

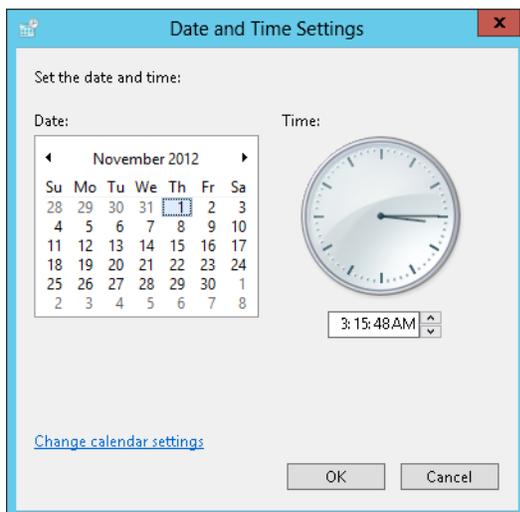
**Note:** The default username and password are "Administrator" and "password".

- 9** Go to Server Manager and click *Local Server* to install the Windows Storage Server update program. Under "PROPERTIES", click the status shown in "Windows Update". Click *Check for updates*, then click the available updates.

Windows Update



- 10** Go back to "Local Server" to set the date and time. Under "PROPERTIES", click the item shown next to "Time zone". In the "Date and Time" tab, click *Change date and time*. Select the current date and time and click *OK*.

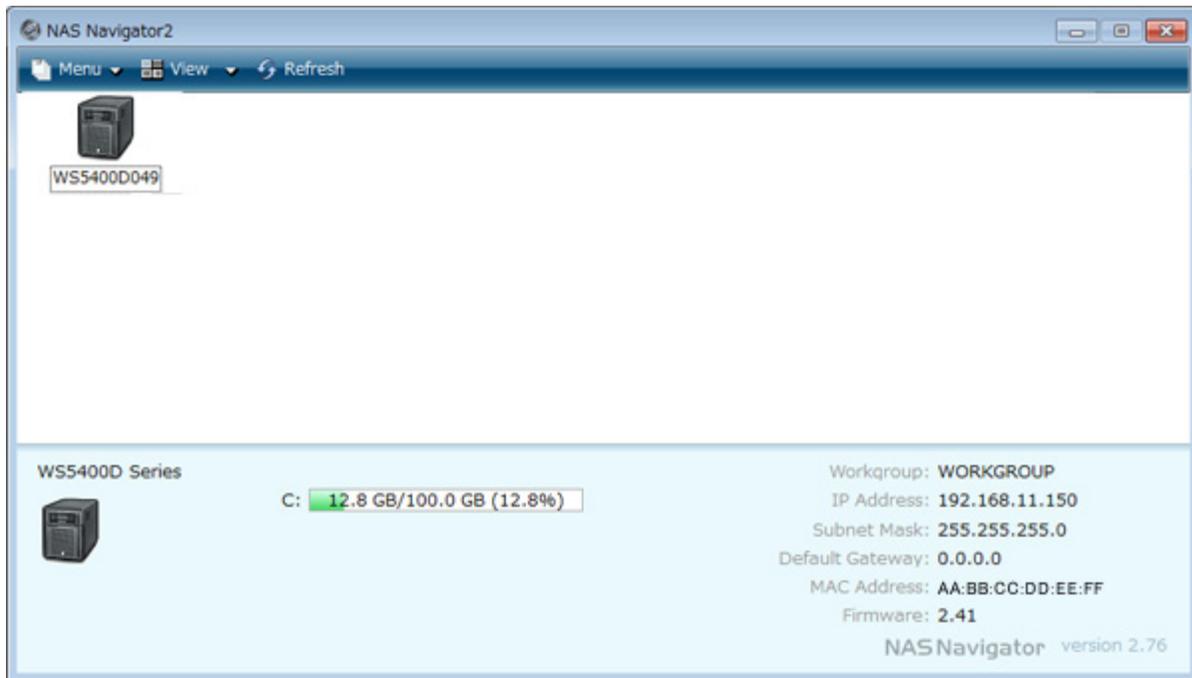


**Note:** In the "Internet Time" tab, click *Change settings*, and check "Synchronize with an Internet time server". The date and time will be updated automatically.

- 11** Create a shared folder. See the "Creating a Shared Folder" section in chapter 7 for more details.

- 12** Change the TeraStation's password. See the "Changing the Password" section in chapter 7 for more details.

- 13** In NAS Navigator2, double-click your TeraStation's icon. For Mac OS, the TeraStation is mounted as a drive icon on the desktop, or it is displayed in the sidebar of the Finder.



**Note:** Never disable the LAN (network device) settings in Windows Storage Server. Disabling the LAN settings will also disable access to the TeraStation.

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## Turning the TeraStation On and Off

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

### Shutting Down Windows Storage Server

- 1** From the Windows Storage Server Start menu, point the cursor to the upper-right hand corner of the screen, then click the  icon.
- 2** Click the  icon - *Shut down*.
- 3** Select the reason why you want to shut down, then click *Continue*.

When all the LEDs on the front of the TeraStation turn 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.

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## Installing Antivirus Software

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Installing antivirus software on the TeraStation is strongly recommended.

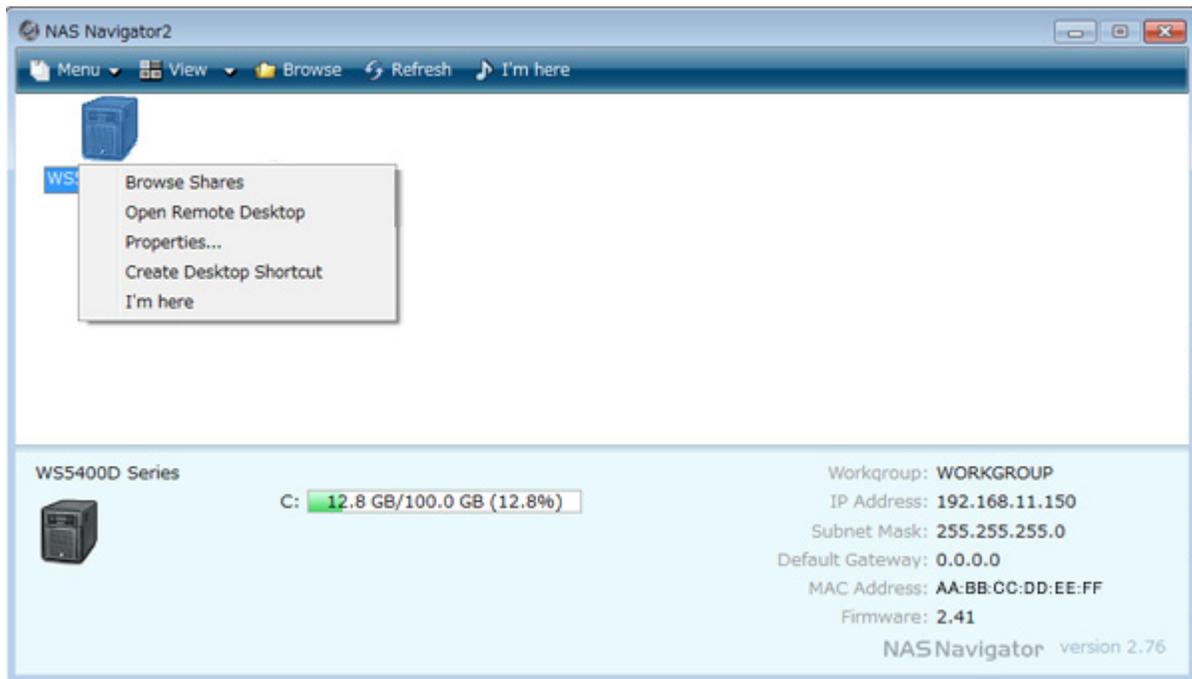
Connect a USB CD/DVD drive to the TeraStation's USB port, load the antivirus software CD into the CD/DVD drive, and install the software.

# Chapter 2 Remote Desktop

## Opening Windows Storage Server

**Note:** If using OS X (10.4 or later), download and install "Remote Desktop Connection Client for Mac 2" from <http://www.microsoft.com>. If using OS X 10.3.9, use version 1.0.3 instead.

- 1 Double-click the  icon to start NAS Navigator2.
- 2 Right-click on your TeraStation's icon and choose *Open Remote Desktop*. For Mac OS, click the TeraStation's icon while holding down the control key, then click *Open Remote Desktop*.



### Notes:

- If Remote Desktop Connection Software doesn't start on a Mac, exit and re-launch NAS Navigator2. To exit NAS Navigator2, click the NAS Navigator icon while holding down the control key and click *Quit*.
- Click the TeraStation icon to view the IP address and other information for the TeraStation.
- If the message "The identity of the remote computer cannot be verified. Do you want to connect anyway?" is displayed, click *Yes* or *Continue*.

- 3 Enter the admin username and password and press the Enter key. Windows Storage Server will open in the remote desktop.

**Note:** The default username and password are "Administrator" and "password".

# Chapter 3 Windows Update

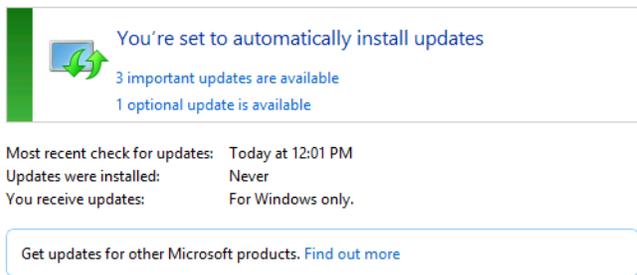
## Windows Update

For best results, Windows Storage Server should be updated regularly. Use Windows Update as described below.

**Note:** The TeraStation must be connected to the Internet to use Windows Update.

- 1** From the Windows Storage Server Start menu, click *Control Panel - System and Security - Windows Update*.
- 2** Click *Check for updates*.
- 3** Click available updates.

Windows Update



- 4** Step through the wizard to install the updates.

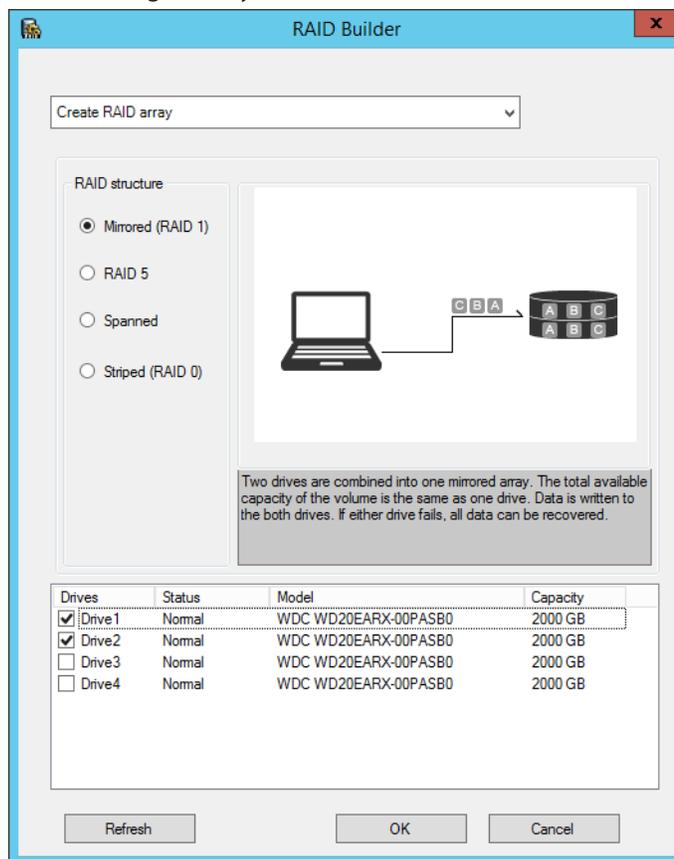
# Chapter 4 Preinstalled Software

## RAID Builder

RAID Builder is used to create RAID arrays. See the "Managing Storage" section in chapter 5 for more details.

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

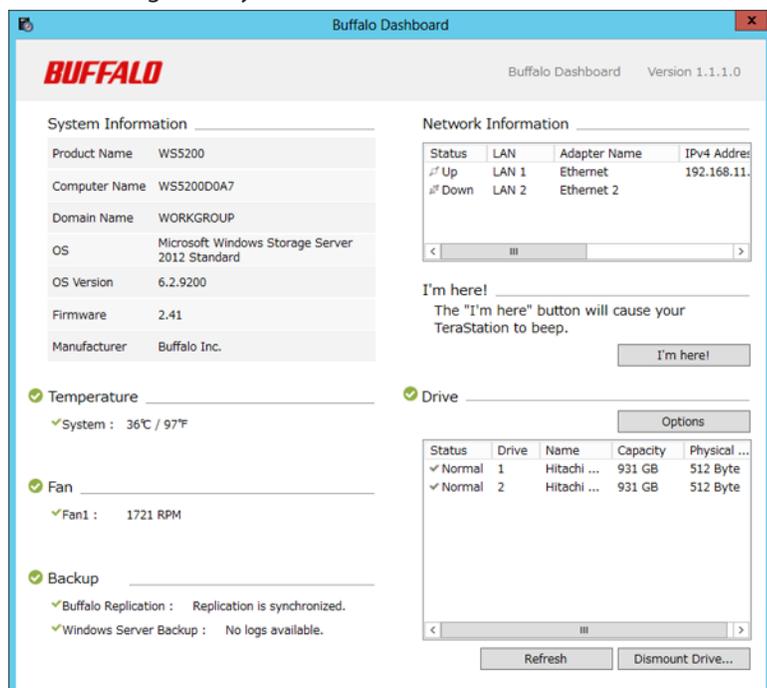
**Note:** This software cannot be accessed by multiple users at the same time. Before launching it, make sure that it is not being used by another user.



## Buffalo Dashboard

Buffalo Dashboard displays system information and dismounts hard 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.



Items	Descriptions
System Information	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. OS Version: Displays the version of the OS. Firmware: Displays the firmware version of the TeraStation. Manufacturer: Displays "Buffalo Inc.".
Temperature	Displays the temperature of the system.
Fan	Displays the rpm.
Backup	Displays the status of backup and replication.
Network Settings	Displays IP addresses, subnet masks, default gateways, LAN port numbers, and status.
I'm here!	Causes your TeraStation to beep.

Items	Descriptions
Drive	<p>Displays the status, drive numbers, names, capacity, and physical sector sizes of each drive.</p> <p>Refresh: Updates the displayed drive information.</p> <p>Dismount Drive: Dismounts a drive for safe removal. Select the drive to dismount and click <i>OK</i>.</p> <p>Options:</p> <p>Shut down when the drive's temperature reaches an abnormal value - The TeraStation will automatically shut down if the drive gets too hot.</p> <p>Turn off the drive if an error occurs - The hard drive will automatically be turned off (dismounted) if a drive error occurs.</p> <p><b>How To Dismount Drives:</b> Click <i>Dismount Drive</i>, check the drive to dismount, then click <i>OK</i>. After the drive is dismounted, unplug the hard drive from the TeraStation.</p>

**Note:** The following functions are only available when logged in as administrator:

- Refresh
- Dismount drive
- Options

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## Email Notification

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Your TeraStation can send you email reports when settings are changed or an error occurs. See the "Email Notification" section in chapter 7 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.

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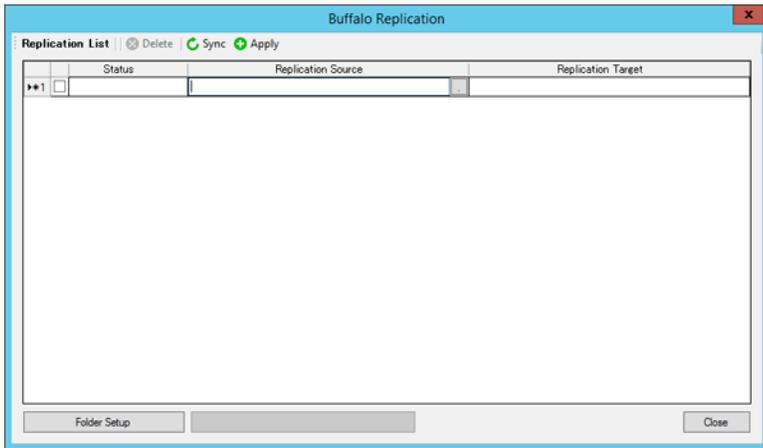
# Buffalo Replication

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Your TeraStation can be synchronized with another TeraStation, replicating most data. See the "Replication" section in chapter 6 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.



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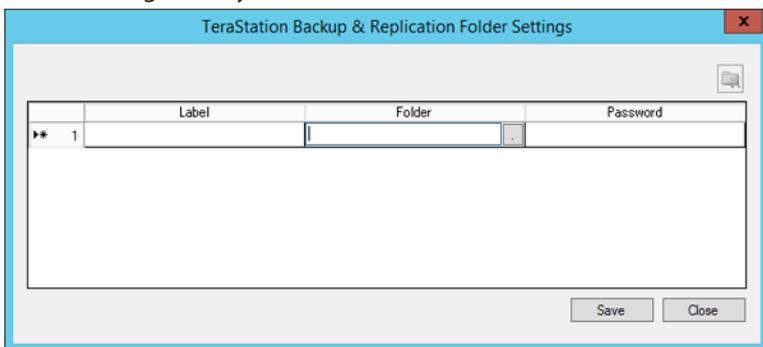
# TeraStation Backup and Replication Folder Settings

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

To launch TeraStation Backup and 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.



Items	Descriptions
Label	Enter a name for the backup 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.
Password	If you enter a backup password (optional), this backup device will not appear on the list of available devices when people search for it, unless they search for it by the password.

Items	Descriptions
	To remove a folder from the list of available backup targets, select the folder and click this button.

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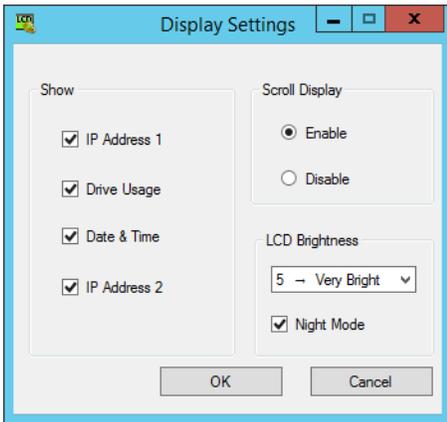
## Display Settings

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TeraStation's LCD panel settings can be changed using this software. See the "LCD Display Settings" section in chapter 7 for more details.

To launch Display 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.



# Chapter 5 Managing Storage

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## Creating Volumes

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### Volume Types

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The features of each volume type are explained below.

**Notes:**

- Use RAID Builder to create a volume, not the Disk Management options in Windows Storage Server.
- When volumes are deleted or formatted, or the RAID mode is changed, all data stored in that volume is erased. Before executing these operations, back up any important data.
- In this manual, "recover" means reverting the TeraStation (including the data) to its former state prior to the drive failure. It doesn't refer to reading data from a failed hard drive.
- RAID synchronization will run automatically after a volume is created. File transfers will be slower while it is running, which will take about 5 hours per terabyte.
- After a volume is created, unused extra space can't be added to the volume.
- Some space on each drive is not accessible because it is used by the system. The amount used on each drive is below.  
Drive 1: 50 MB  
Drive 2: 50 MB  
Drive 3 to 6: 100 GB + 150 MB

### RAID 5 Volumes\*

The unallocated areas of three or more hard drives are used as a single array.

If one drive in a RAID 5 array fails, data on the array can be recovered after the failed drive is replaced. However, if two or more drives fail, all data is lost.

\*Available for WS5600D, WS5400D, and WS5400R series TeraStations.

### Mirrored Volumes (RAID 1)

The unallocated areas of two drives are combined into a single RAID 1 array.

Because the same data is written to both drives simultaneously, if one drive fails, data can be recovered from the other drive. If both drives in the array fail, data cannot be recovered.

### Striped Volumes (RAID 0)

The unallocated areas of two or more drives are combined into a single RAID 0 array. However, data cannot be recovered if even a single drive fails.

## Spanned Volumes

The unallocated areas of multiple hard drives are joined to create a single logical volume. This allows various drive spaces to be combined efficiently. However, data cannot be recovered if even a single drive fails.

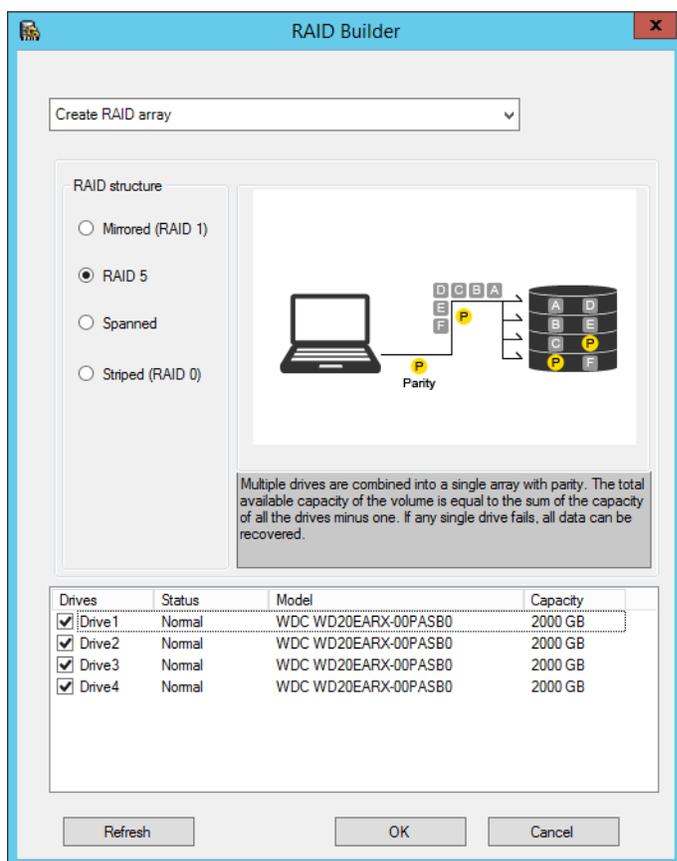
## Simple Volumes (JBOD)

The internal hard drives of the TeraStation are each used as individual drives. If a hard drive fails, the data on the failed hard drive cannot be recovered.

## Creating a RAID 5 Volume

---

- 1 From the Windows Storage Server Start menu, click *RAID Builder*.
- 2 Select "Create RAID array" from the drop-down menu and "RAID 5" under "RAID structure".
- 3 Select at least three drives to create a RAID 5 array.
- 4 Click OK.



### Examples:

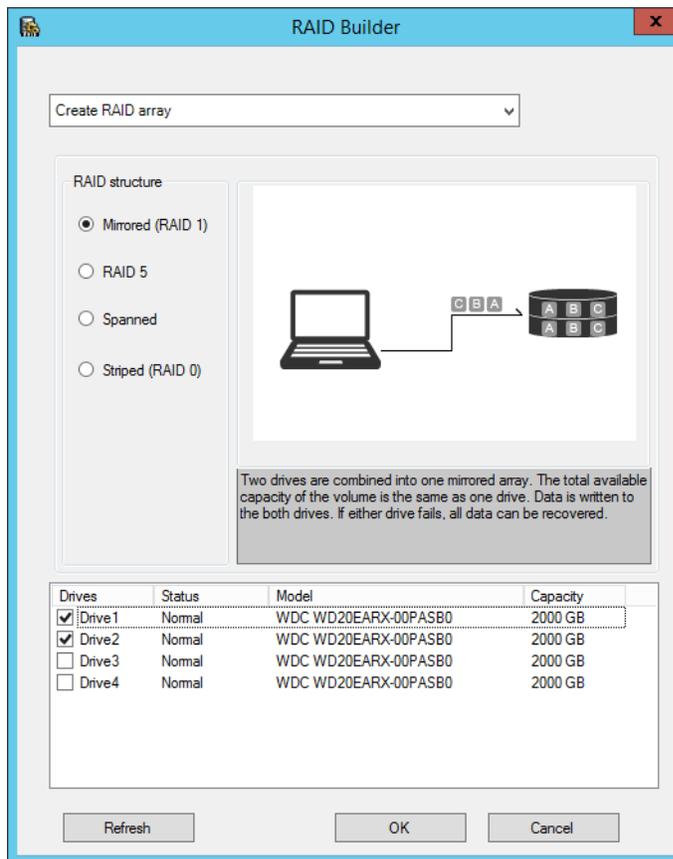
- For a configuration with drive 1 (50 GB), drive 2 (80 GB), drive 3 (58 GB), and drive 4 (100 GB), the usable space on the RAID volume will be  $(50 \text{ GB} \times 4 \text{ drives}) \div 3/4 = 150 \text{ GB}$ .
- For "n (1 to 4)" identical hard drives in a RAID 5 array, the available space is  $(n-1)/n$  times the total drive space.

A RAID 5 volume will be created. Next, create a shared folder on the volume as described in chapter 7.

## Creating a Mirrored Volume (RAID 1)

---

- 1 From the Windows Storage Server Start menu, click *RAID Builder*.
- 2 Select "Create RAID array" from the drop-down menu and "Mirrored (RAID 1)" under "RAID structure".
- 3 Select at least two drives to create a RAID 1 array.
- 4 Click *OK*.



### Example:

For a configuration with drive 3 (58 GB) and drive 4 (100 GB), the usable space on the mirrored volume will be 58 GB.

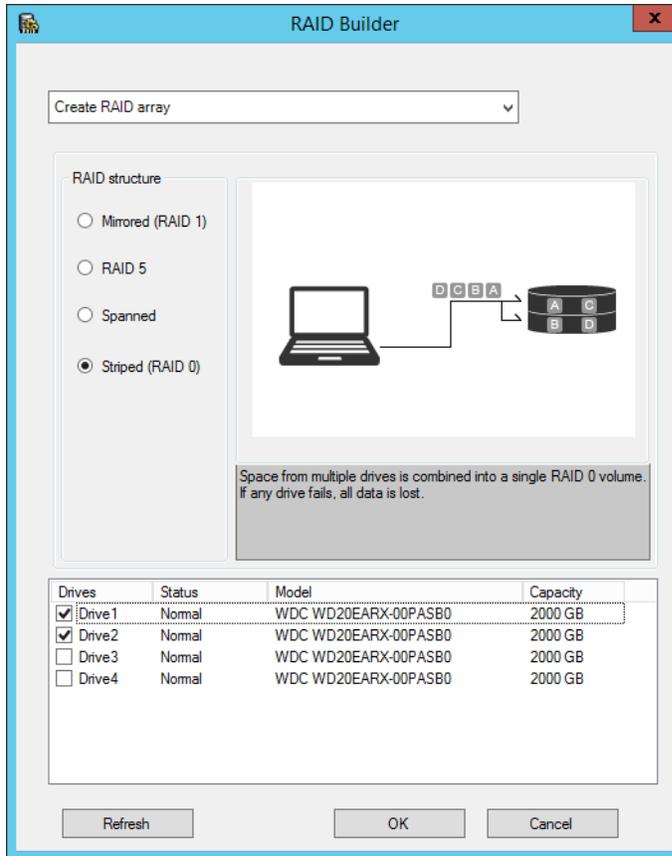
A mirrored volume will be created. Next, create a shared folder on the volume as described in chapter 7.

## Creating a Striped Volume (RAID 0)

---

- 1 From the Windows Storage Server Start menu, click *RAID Builder*.
- 2 Select "Create RAID array" from the drop-down menu and "Striped (RAID 0)" under "RAID structure".
- 3 Select at least two drives to create a RAID 0 array.

## 4 Click OK.



### Example:

For a configuration with drive 1 (50 GB), drive 2 (80 GB), drive 3 (58 GB), and drive 4 (100 GB), the usable space on the mirrored volume will be 50 GB x 4 drives = 200 GB.

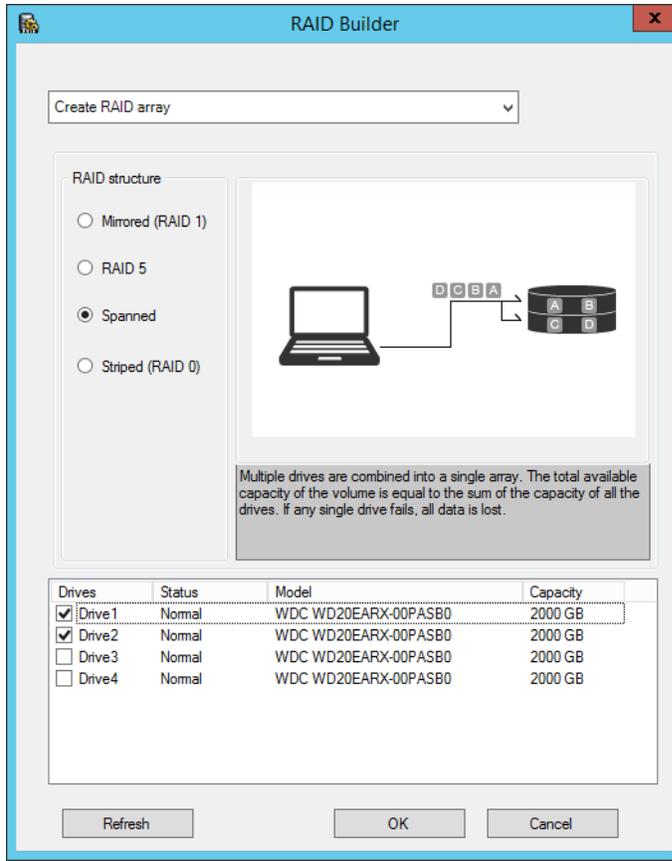
A striped volume will be created. Next, create a shared folder on the volume as described in chapter 7.

## Creating a Spanned Volume

---

- 1 From the Windows Storage Server Start menu, click *RAID Builder*.
- 2 Select "Create RAID array" from the drop-down menu and "Spanned" under "RAID structure".
- 3 Select at least two drives to create a spanned array.

## 4 Click OK.



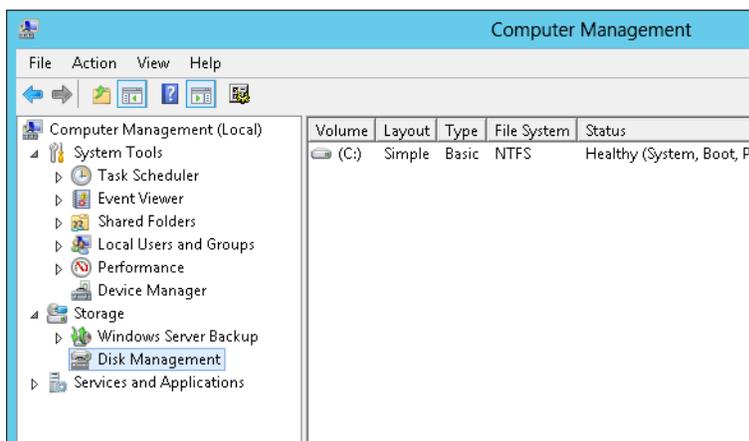
### Example:

For a configuration with drive 1 (50 GB), drive 2 (80 GB), drive 3 (58 GB), and drive 4 (100 GB), the usable space on the RAID volume will be 50 GB + 80 GB + 58 GB + 100 GB = 288 GB.

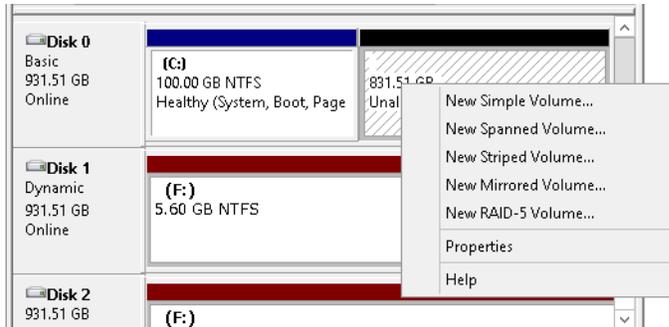
A spanned volume will be created. Next, create a shared folder on the volume as described in chapter 7.

## Creating Simple Volumes (JBOD)

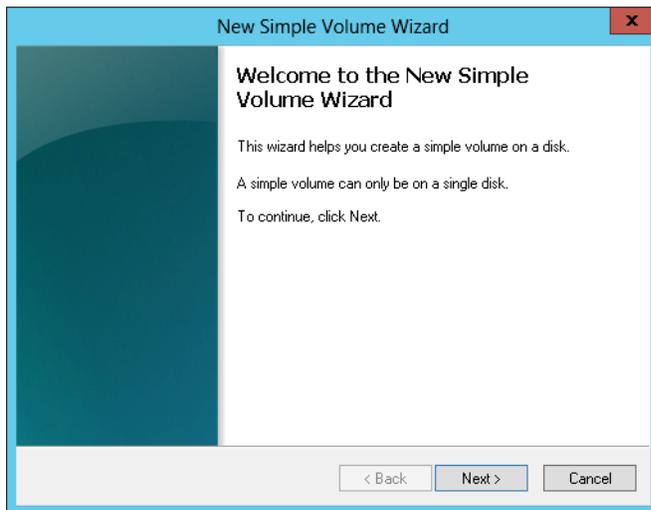
- 1 From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.
- 2 Click *Disk Management*.



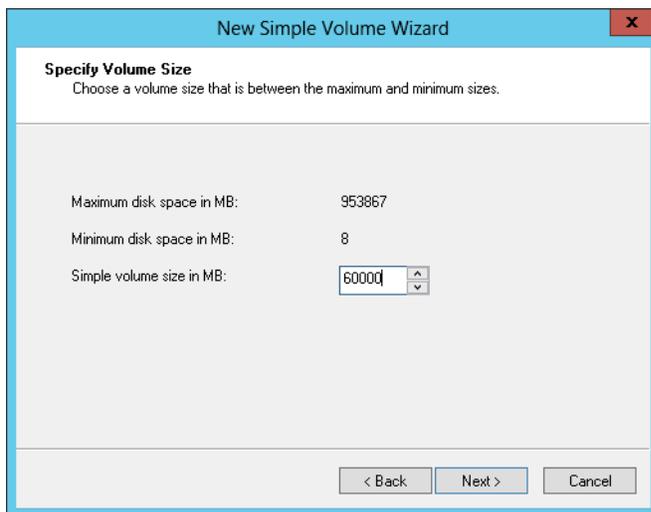
**3** Right-click the unallocated area and select *New Simple Volume*.



**4** Click *Next*.



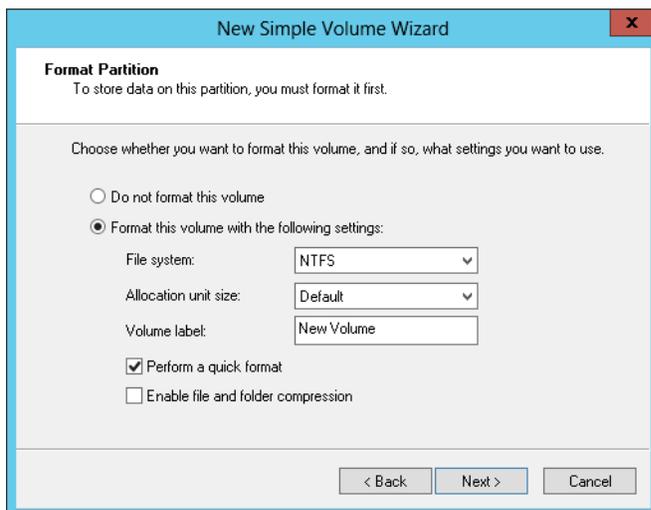
**5** Enter the volume size that you want to create and click *Next*.



- 6** Select *Assign the following drive letter* and click *Next*.



- 7** Select *Format this volume with the following settings* and *Perform a quick format* and click *Next*.



A simple volume will be created. Next, create a shared folder on the volume as described in chapter 7.

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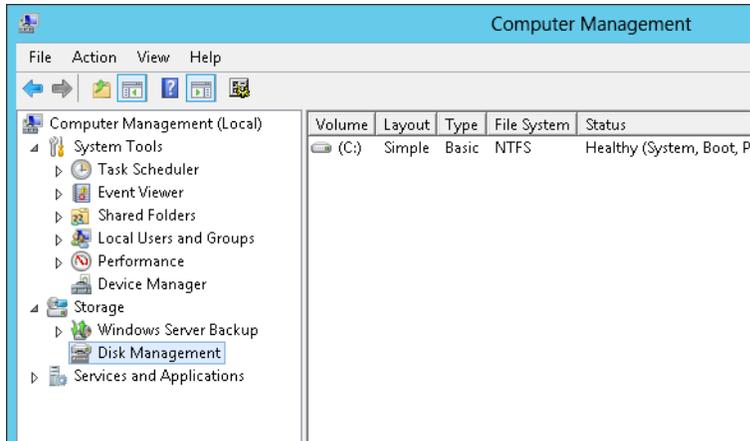
## Deleting Volumes

---

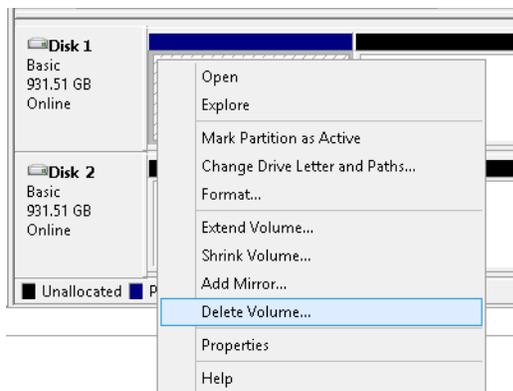
An unallocated area on a drive is required to create a volume. If there are no unallocated areas, create one by deleting an existing volume.

- 1** From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.

2 Click *Disk Management*.



3 Right-click the volume that you want to delete and then select *Delete Volume*.



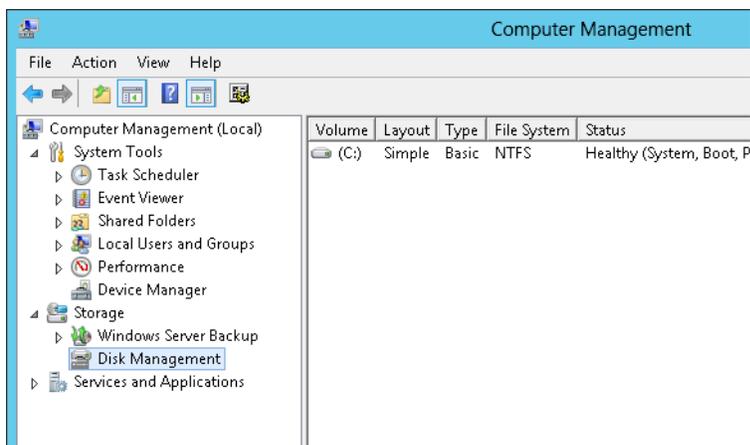
---

## Formatting Volumes

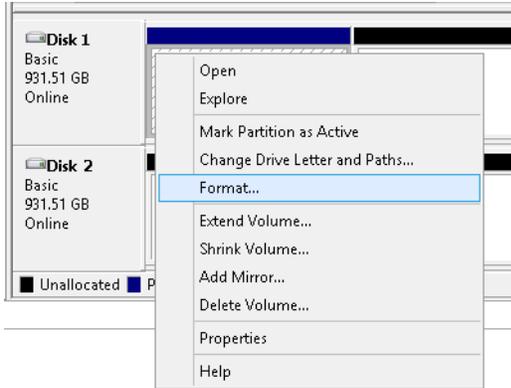
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1 From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.

2 Click *Disk Management*.



- 3** Right-click the volume that you want to format and select *Format*.

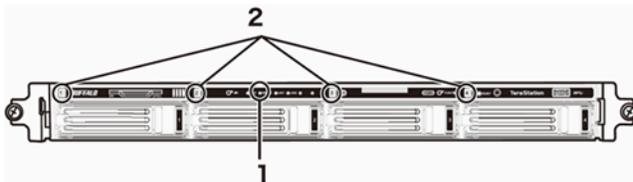
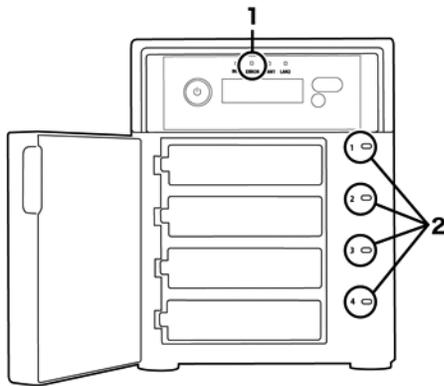


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## Hard Drive Replacement Procedure

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



### **1** Error LED

Red if a drive has failed.

### **2** Status LEDs

Green: Normal operation.

Glowing red: If a drive's status LED is glowing red, the drive has malfunctioned. Dismount the drive in Buffalo Dashboard before unplugging it from the TeraStation.

#### Notes:

- Do not unplug a drive whose status LED is not lit red. If you remove the drive without properly dismounting it, data may be lost or the TeraStation may malfunction.

- When changing drives, the replacement drive should be a Buffalo OP-HDS series drive of the same size.
- The TeraStation is fragile. Handle it with care. Do not drop or bump the TeraStation.
- Use caution when handling the unit in order to avoid personal injury.
- Never disassemble any parts while you are replacing a hard 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 hard drives in the TeraStation. For example, pulling out drive 1 and replacing it with drive 2 may cause data to be corrupted or lost.
- The boot drive (C:) consists of the mirrored volume and a portion of the two drives from the top. Do not replace both of these hard drives at the same time.
- If a hard drive is replaced while saving a file, the file can be corrupted. Be sure that the saving operation is completed before replacing the hard drive.

## Hard Drive Replacement Examples

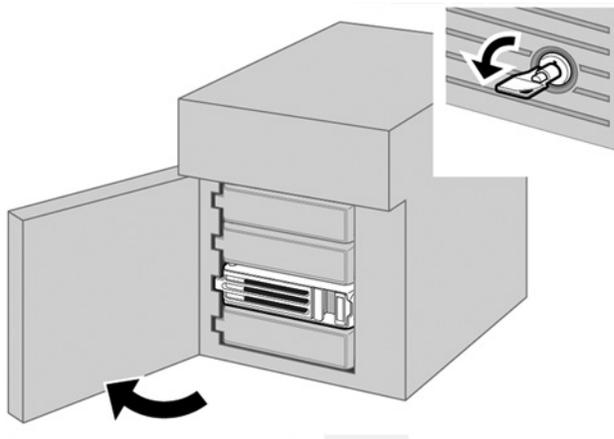
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### A Drive Failure Occurs in Drive 1 or 2

#### Notes:

- If one of the drives in the boot drive fails, repair the mirrored volume of the system area first after replacing the drive. Repairing the volume for the data area first may not always succeed.
- If you used Disk Management to mirror the boot drive, the TeraStation will not boot when the drive fails. Follow the procedure below.

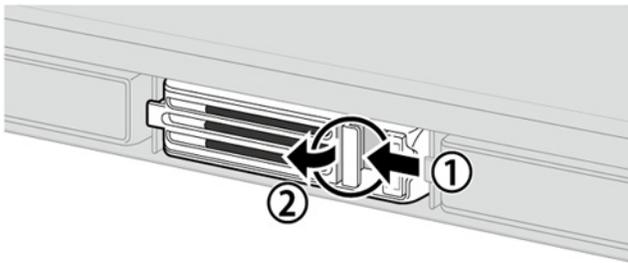
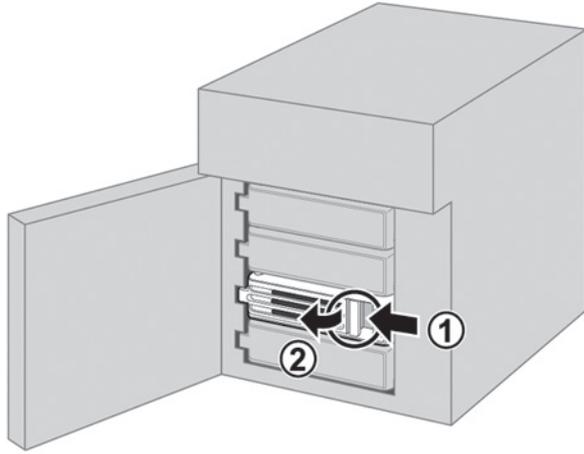
- 1** If your TeraStation has a front cover, open it with the included key.



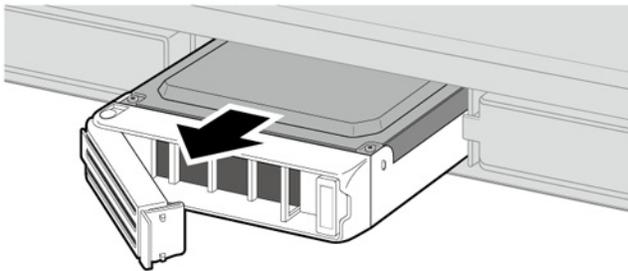
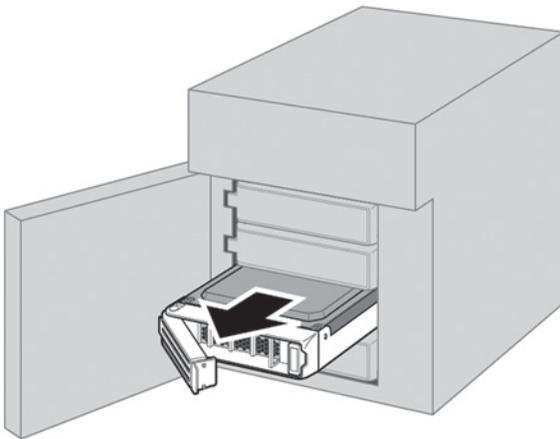
- 2** Make a note of the drive number where the status LED glows red.

- 3** Shut down the TeraStation.

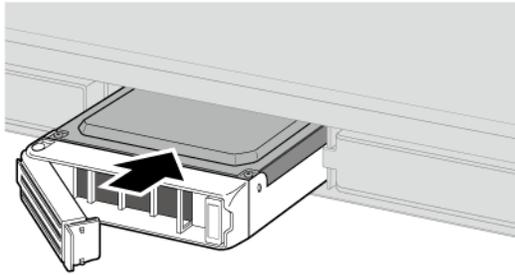
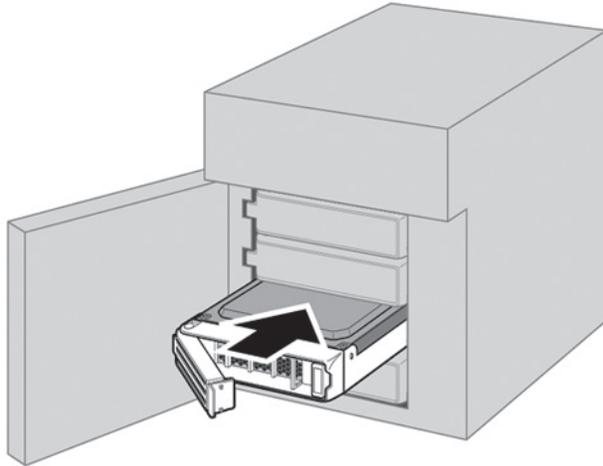
- 4** Push the unlock button of the failed hard drive and swing the lock mechanism out.



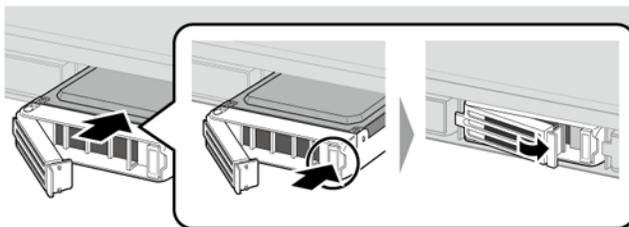
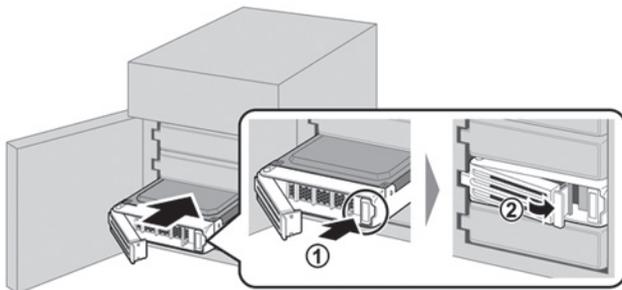
- 5** Pull out the drive cartridge and remove it from the TeraStation.



- 6 Insert the new drive in the empty slot. Slide the drive in with the locking mechanism open.



- 7 Swing the lock back down until it clicks into place.

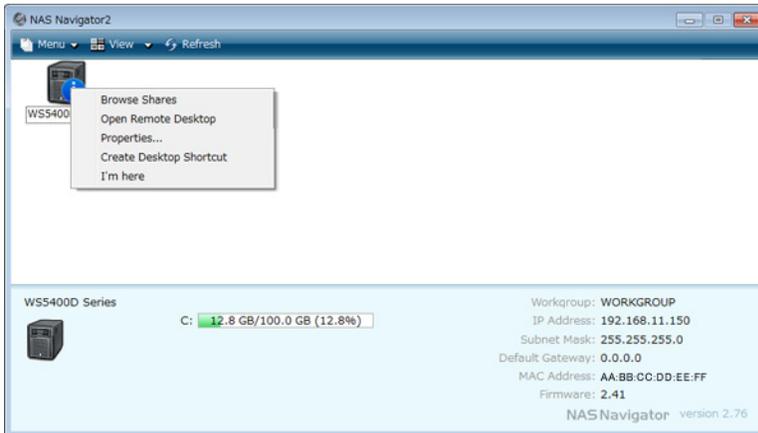


- 8 Close the front cover with the included key. Press the power button on the TeraStation to turn it on.

**Note:** If drive 1 is being replaced, the red error LED will light up and "POST ERR: 00D9 Boot from HDD x" will be displayed on the LCD panel. Wait for the unit to reboot. When the reboot is finished, go on to the next step.

- 9 Double-click the  icon to start NAS Navigator2.

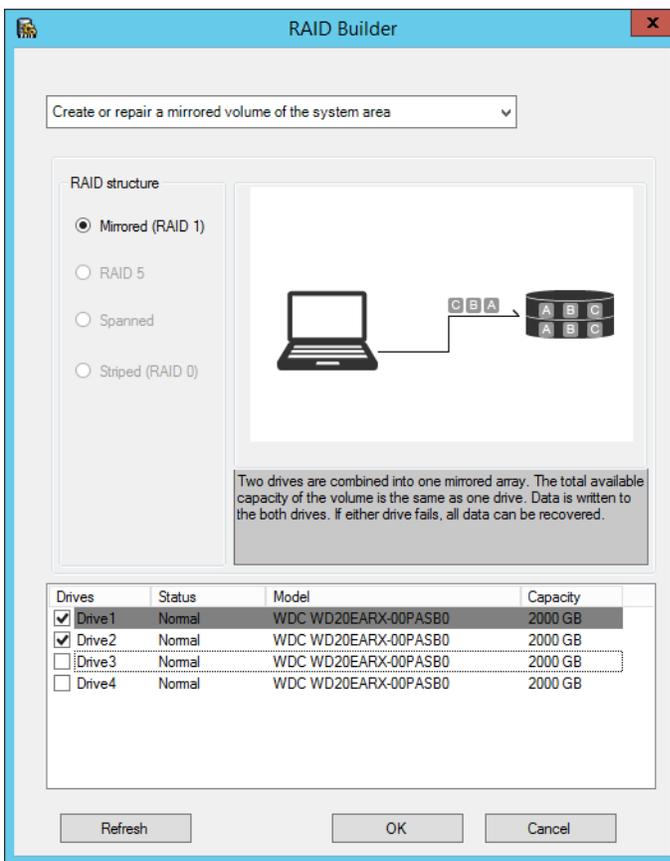
- 10** Right-click on your TeraStation's icon and click *Open Remote Desktop*. For Mac, click the TeraStation icon while holding down the control key and click *Open Remote Desktop*.



- 11** Enter the username and password and press the Enter key. Windows Storage Server opens in the remote desktop.  
**Note:** The default username and password are "Administrator" and "password".

- 12** Click *RAID Builder* from the Start menu of Windows Storage Server.

- 13** Select *Create or repair a mirrored volume of the system area*, check replaced hard drive, and click *OK*.

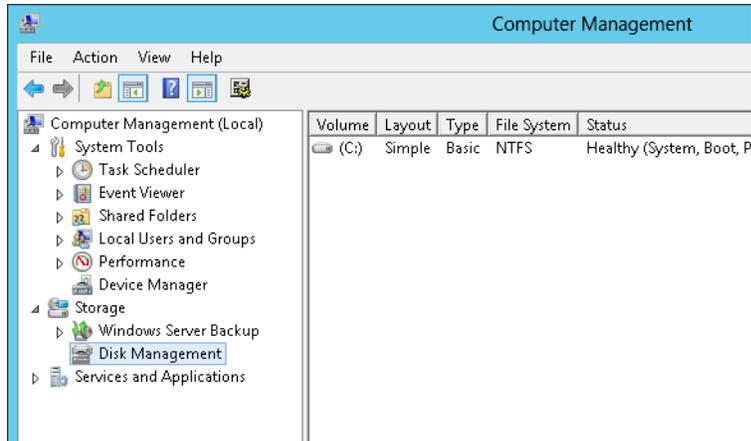


- 14** When "When Drive x will be initialized. Continue?" is displayed, click *OK*. It will take about an hour for the mirrored volume to be repaired. You can check the progress of the repair in Disk Management. After creating a mirrored

volume, you will see the message dialogue to restart your TeraStation. Follow the instructions displayed. When the reboot is finished, go to the next step.

**15** From the Windows Storage Server Start menu, open *Administrative Tools* and double-click *Computer Management*.

**16** Click *Disk Management*.



**17** Select the step depending on your purpose for a created volume.

**To create a new volume (except for a RAID 5 or mirrored volume):**

- (1) Right-click the new dynamic disk and select *New Volume*.
- (2) Follow the instructions on the screen to create a new volume.

**To restore a RAID 5 volume (RAID resynchronization):**

- (1) Right-click the volume labeled "Failed Redundancy" and click *Restore Volume*.
- (2) When "Select the disk from the following list" is displayed, select the drive to restore and click *OK*. Perform steps (1) and (2) for each volume that requires RAID resynchronization.
- (3) Right-click the volume labeled "Missing" and select *Delete Disk*.

**To restore a mirrored volume (RAID resynchronization):**

- (1) Right-click the volume labeled "Failed Redundancy" and click *Remove Mirror*.
- (2) When "Remove Mirror" is displayed, select the drive with its status missing and click *Remove Mirror*.
- (3) When "Are you sure you want to remove the mirror?" is displayed, click *OK*. Perform steps (1) to (3) for each volume that requires RAID resynchronization.
- (4) Select the new volume where mirroring will be performed and select *Add Mirror*.
- (5) When "Add Mirror" is displayed, select the drive where mirroring will be performed with the selected volume and click *Add Mirror*.

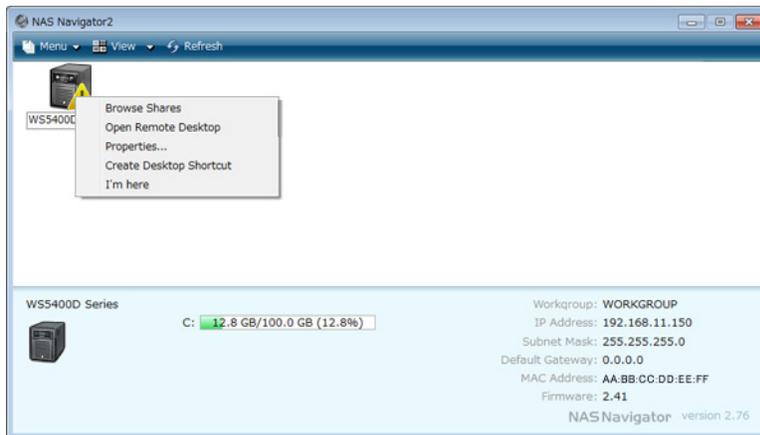
## If a Mirrored Volume Failed to Restore

If a mirrored volume doesn't restore the first time, try the steps above a second time. If the mirrored volume still cannot be restored, contact Buffalo technical support for assistance.

## A Drive Failure Occurs among Drives 3–6

**1** Double-click the  icon to start NAS Navigator2.

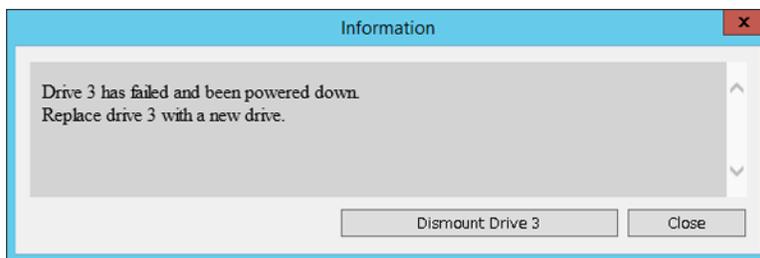
- 2** Right-click on your TeraStation's icon, then click *Open Remote Desktop*. For Mac OS, click the TeraStation's icon while holding down the control key, then click *Open Remote Desktop*.



- 3** Enter the username and password, then press the Enter key. Windows Storage Server will open in the remote desktop.

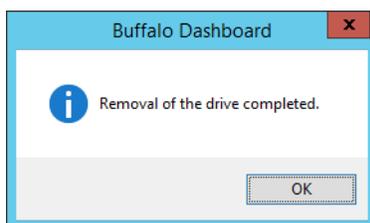
**Note:** The default username and password are "Administrator" and "password".

- 4** The error message (E30) will be displayed in Buffalo Dashboard.



- 5** Click *Dismount Drive X* (where "X" is the number of the failed drive).

- 6** When the message "Removal of the drive completed." is displayed, click *OK*.

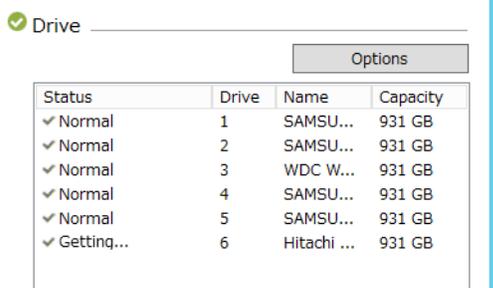


The status LED will stop flashing and glow steadily.

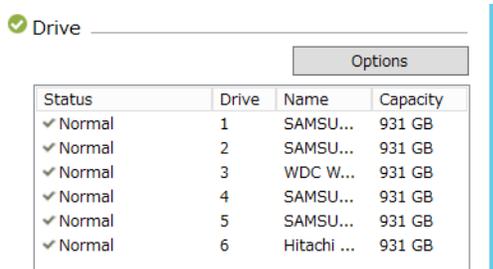
- 7** If your TeraStation has a front cover, open it with the included key.
- 8** Push the unlock button of the failed hard drive and swing the lock mechanism out.
- 9** Pull out the hard drive cartridge and remove it from the TeraStation.
- 10** Insert the new hard drive (sold separately) into the empty slot. Slide the drive in with the locking mechanism open.
- 11** Swing the lock back down until it clicks into place.

**12** Close the front cover with the included key. If the hard drive was replaced while the TeraStation was off, power it on now.

**13** Buffalo Dashboard will show the drive status "Getting...".

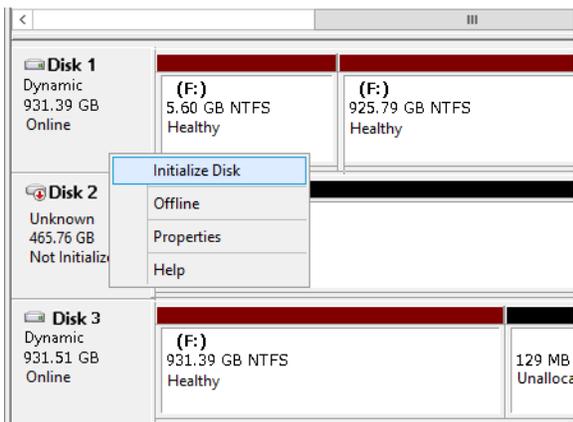


**14** After the drive status changes to "Normal", open *Administrative Tools* and double-click *Computer Management* in Windows Storage Server.

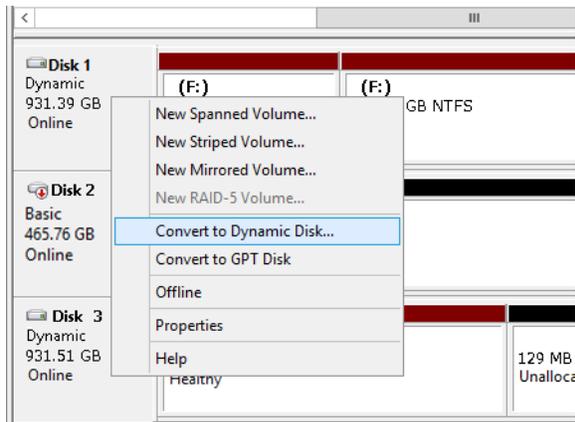


**15** Click *Disk Management*.

**16** Right-click the new drive and select *Initialize Disk*.



- 17** Right-click the initialized hard drive and select *Convert to Dynamic Disk*. A RAID array cannot be built unless the hard drive is converted to a dynamic disk.



- 18** Select the step depending on your purpose for a created volume.

**To create a new volume (except for a RAID 5 or mirrored volume):**

- (1) Right-click the new dynamic disk and select *New Volume*.
- (2) Follow the instructions on the screen to create a new volume.

**To restore a RAID 5 volume (RAID resynchronization):**

- (1) Right-click the volume labeled "Failed Redundancy" and click *Restore Volume*.
- (2) When "Select the disk from the following list" is displayed, select the drive to restore and click *OK*. Perform steps (1) and (2) for each volume that requires RAID resynchronization.
- (3) Right-click the volume labeled "Missing" and select *Delete Disk*.

**To restore a mirrored volume (RAID resynchronization):**

- (1) Right-click the volume labeled "Failed Redundancy" and click *Remove Mirror*.
- (2) When "Remove Mirror" is displayed, select the drive with its status missing and click *Remove Mirror*.
- (3) When "Are you sure you want to remove the mirror?" is displayed, click *OK*. Perform steps (1) to (3) for each volume that requires RAID resynchronization.
- (4) Select the new volume where mirroring will be performed and select *Add Mirror*.
- (5) When "Add Mirror" is displayed, select the drive where mirroring will be performed with the selected volume and click *Add Mirror*.

# Chapter 6 Backup

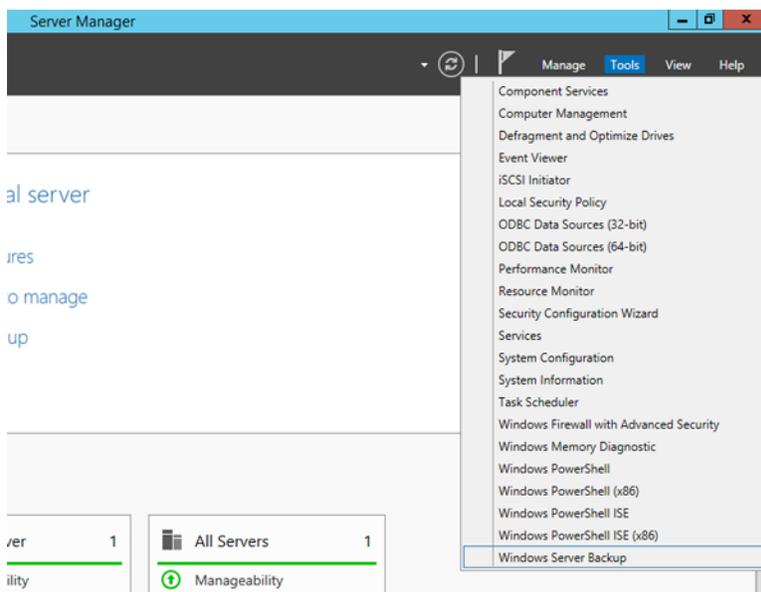
To avoid losing data accidentally, back up your data regularly.

## Back Up in Windows Storage Server

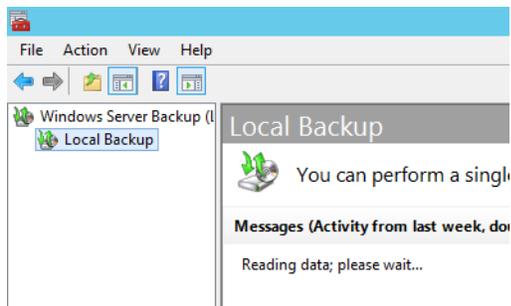
You can back up TeraStation folders in Windows Storage Server.

### Preparing a Backup Destination

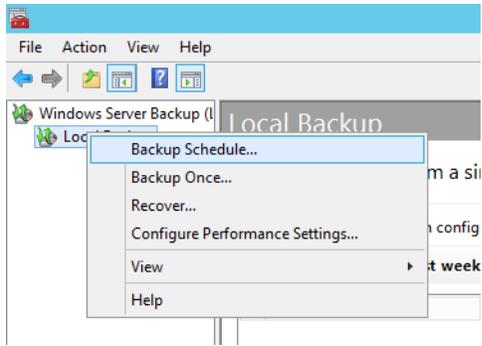
- 1 In Server Manager, click *Tools - Windows Server Backup*. Windows Server Backup will start.



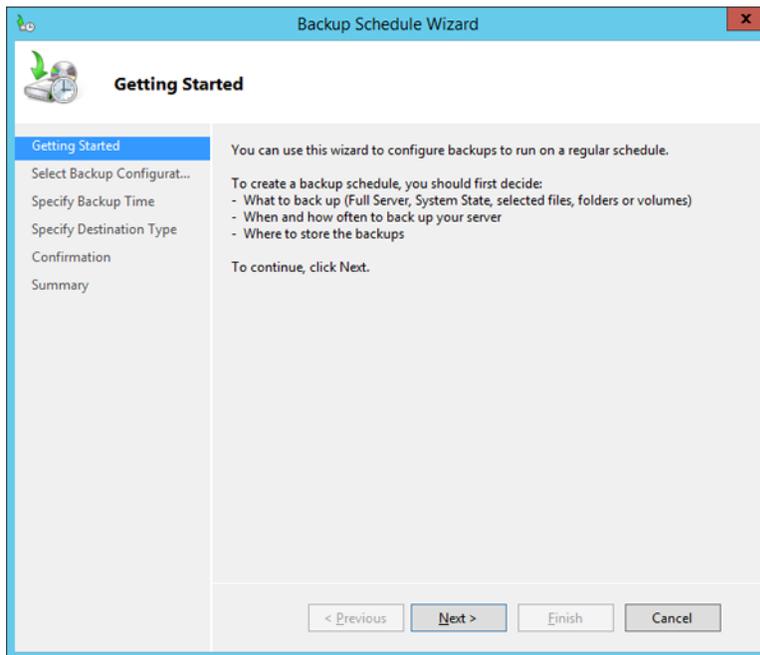
- 2 Click *Local Backup*. If "Reading data; please wait..." is displayed, please wait until these messages disappear.



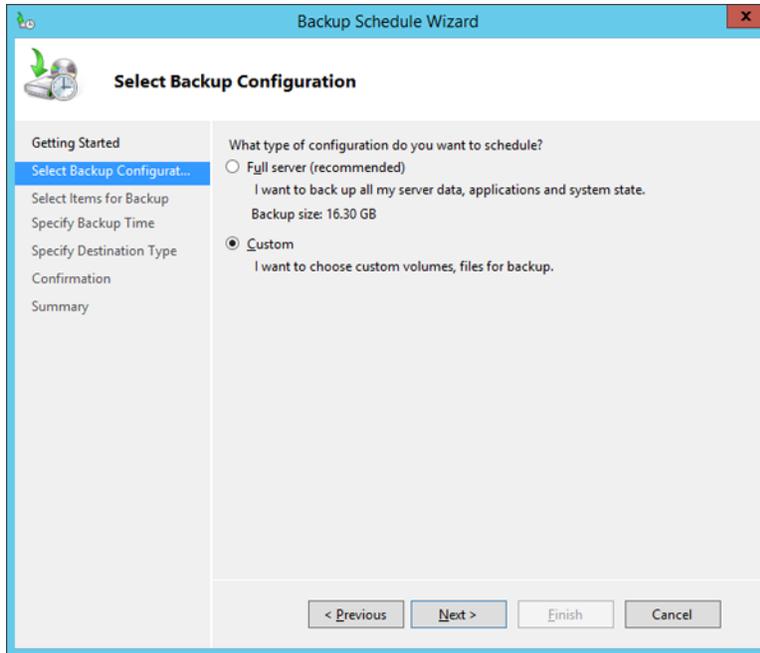
3 Right-click on "Local Backup" and select *Backup Schedule....* The backup schedule wizard will start.



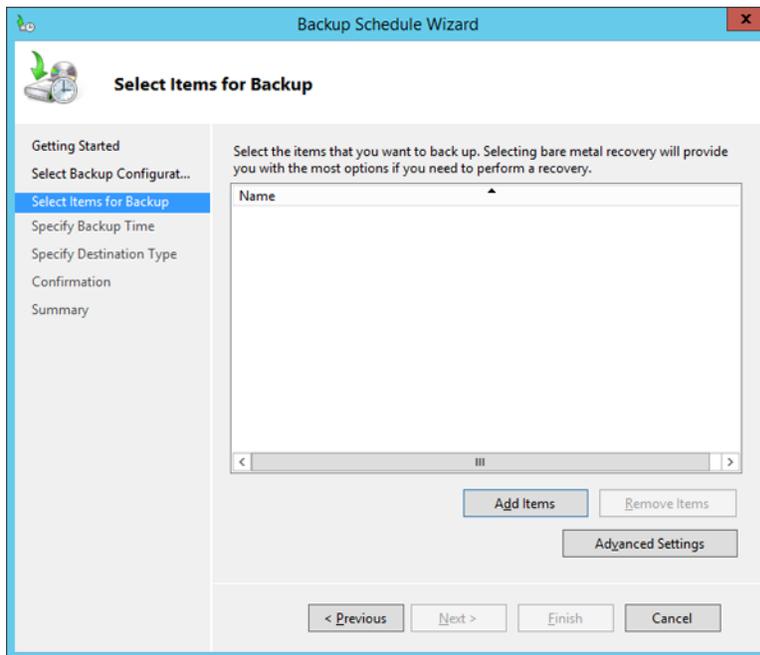
4 Click Next.



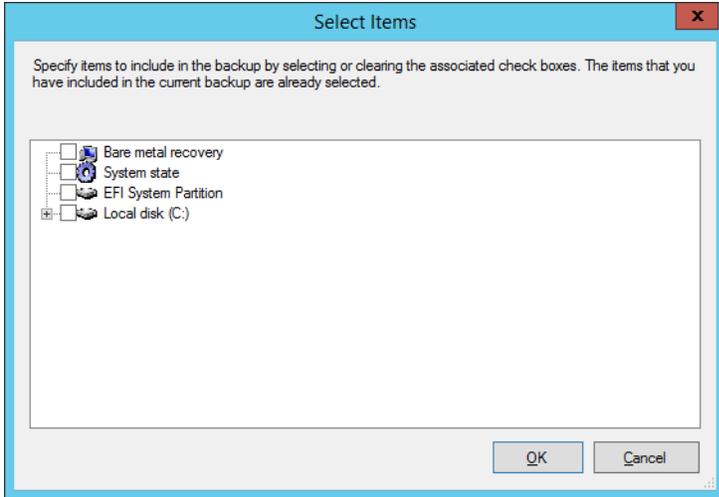
5 Select "Custom" and click Next.



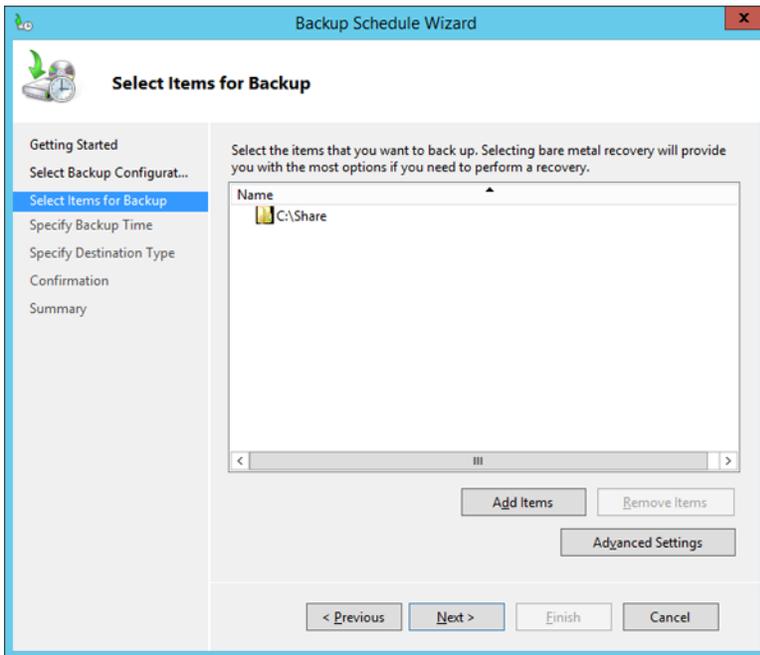
6 Click Add Items.



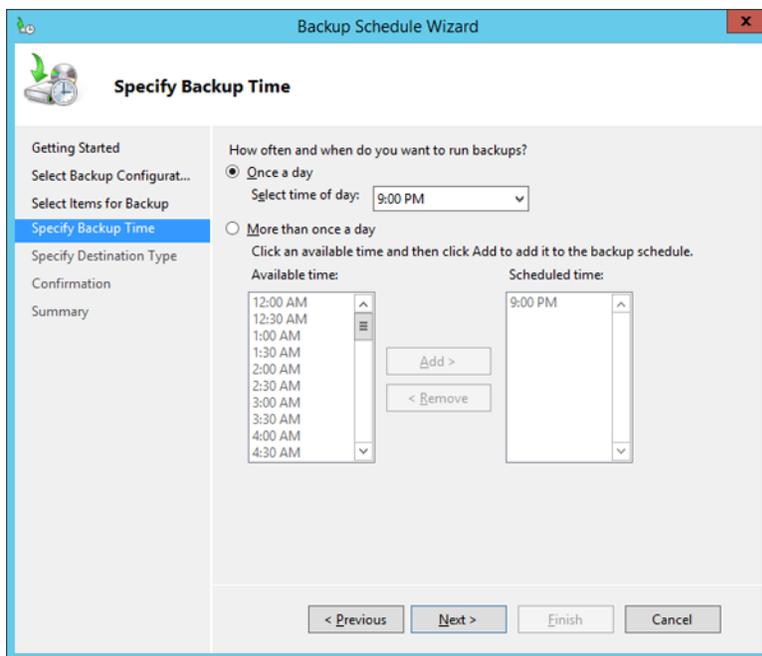
7 Select the backup source folders or drives and click *OK*.



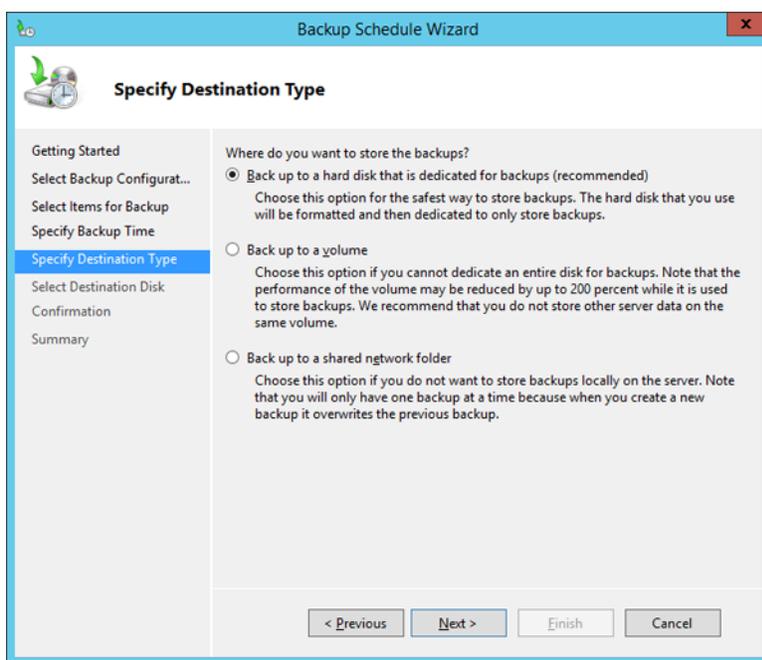
8 Click *Next*.



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



10 Select the backup destination and click Next.

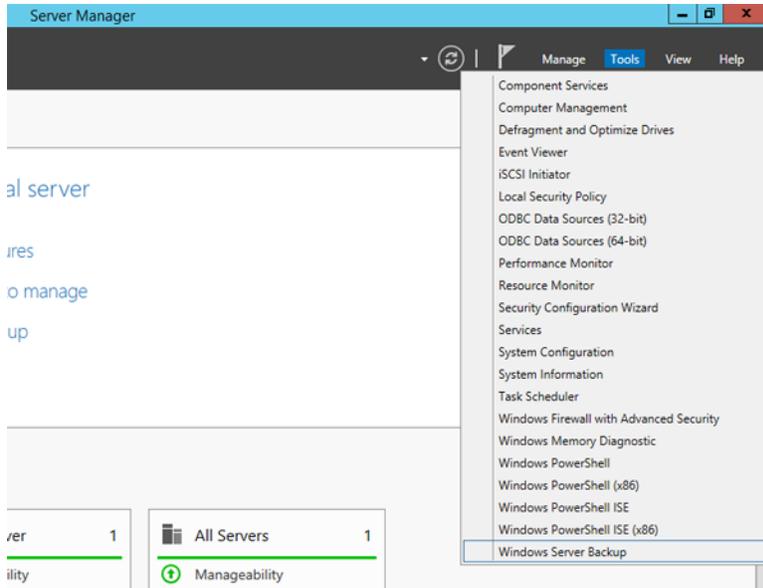


11 Step through the wizard to finish.

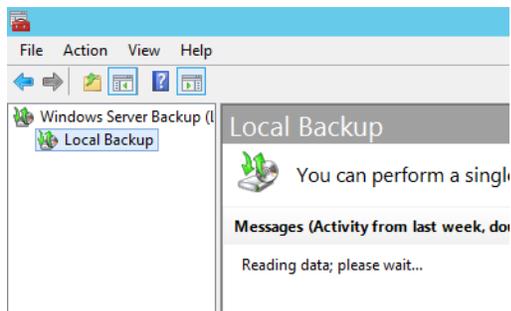
## Recovering Backup Data

Recover the backup data to the TeraStation.

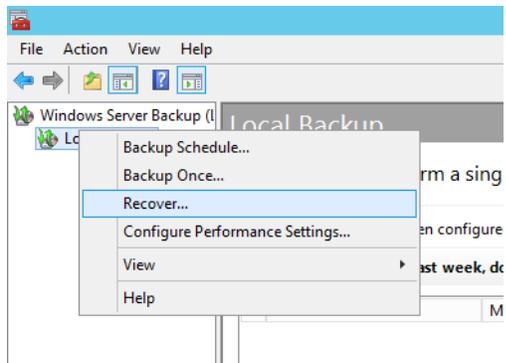
1 In Server Manager, click *Tools - Windows Server Backup*. Windows Server Backup will start.



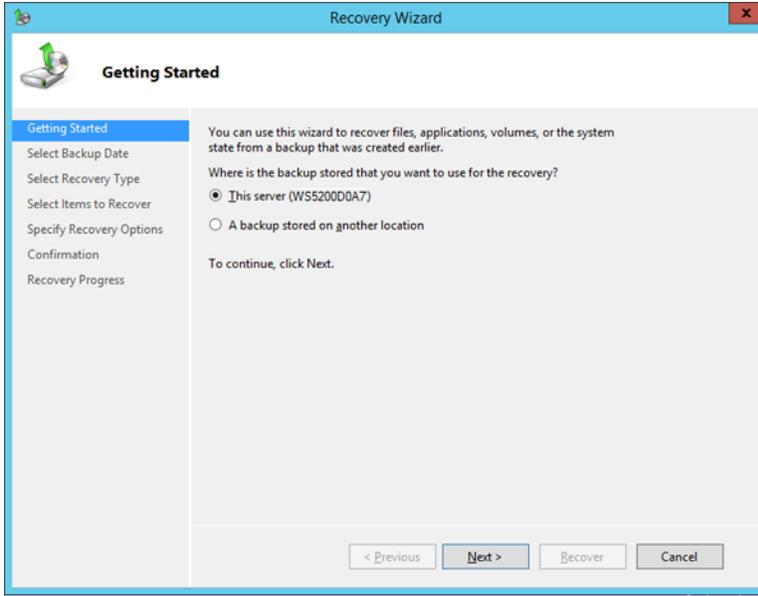
2 Click *Local Backup*. If "Reading data; please wait..." is displayed, please wait until these messages disappear.



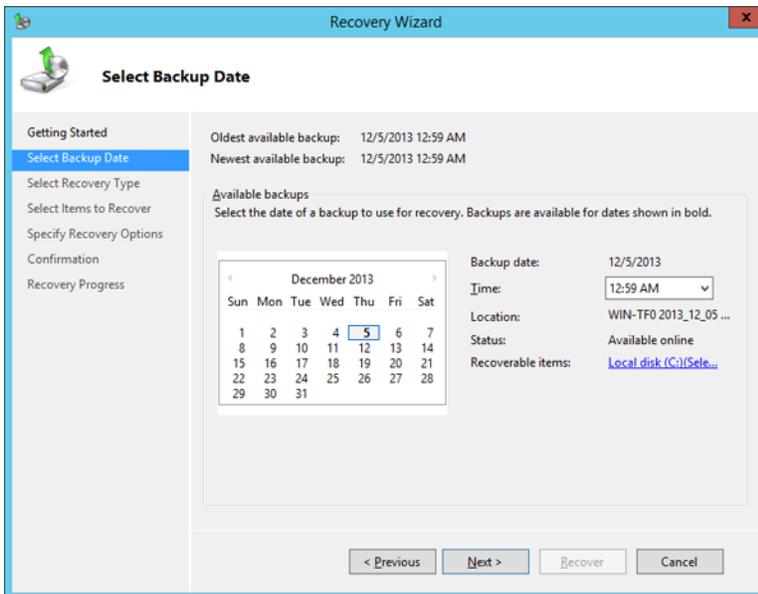
3 Right-click on "Local Backup" and click *Recover...*. The recovery wizard will start.



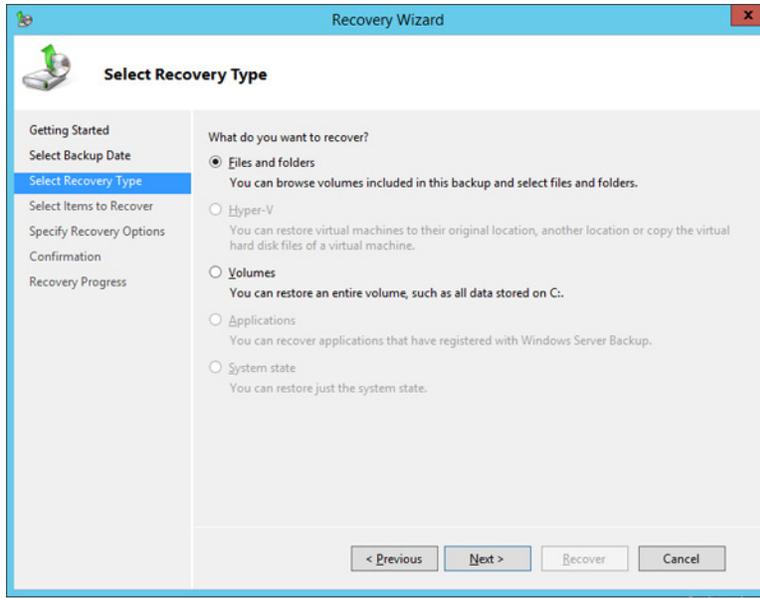
## 4 Click Next.



## 5 Select the date when backing up the data and click OK.



**6** Select the recovery targets and click *Next*.



**7** Step through the wizard to finish.

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## Replication

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### Buffalo Replication

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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.

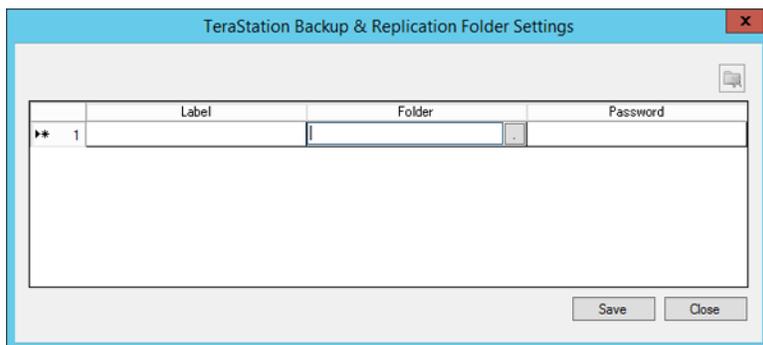
**Notes:**

- For best results, use static IP addresses for both replication TeraStations (source and target).
- Replication source data is copied to the replication target folder with a differential overwrite. Data that is not in the replication source will not be overwritten. Access attributes for the folders and files in the replication source will not be copied to the replication target.

If you use Buffalo WS5000 or WS5000R2 series TeraStations for the replication source and target, start from step 1. If you use a different TeraStation as the replication target, refer to that TeraStation's user manual to configure as a replication target. When you finish configuring, go to step 3.

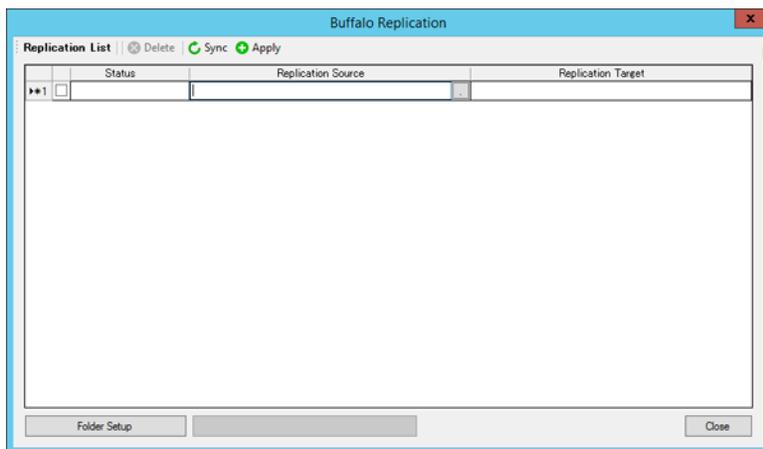
**1** Click *TeraStation Backup & Replication Folder Settings* in the Start menu on Windows Storage Server.

- 2 Double-click the blank space under "Label" and enter a label for the folder. Click  under "Folder" and select the folder as a replication target. If you enter a backup password, the new folder will not be listed as a target folder for backup. Click *OK* when finished.



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

- 4 Click the blank space under "Replication Target" and click . Select a folder from the list for replication target and click *OK*. Click the blank space under "Replication Target" and select the folder from the list. Then click *Select*.



**Note:** Folders with backup passwords configured will not be displayed in the list.

- 5 When the setting is done, click *Apply*. If you configure the backup password for a folder, entering password dialog box will be displayed.

To delete the settings from the list, check the task and click *Delete*. If you click *Sync*, the task will start differential overwrite from the replication source data to the replication target.

- 6 Click *Close*.

Replication is configured.

**Note:** 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/

## DFS Replication

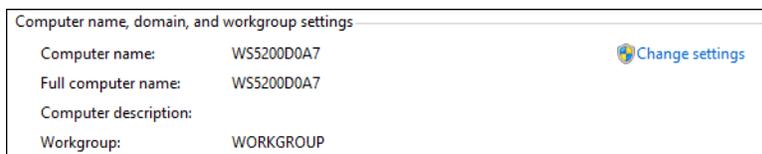
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DFS (Distributed File System) is a set of client and server services that allows Windows users to organize many distributed SMB file shares into a distributed file system. Follow the steps below to enable DFS on the TeraStation.

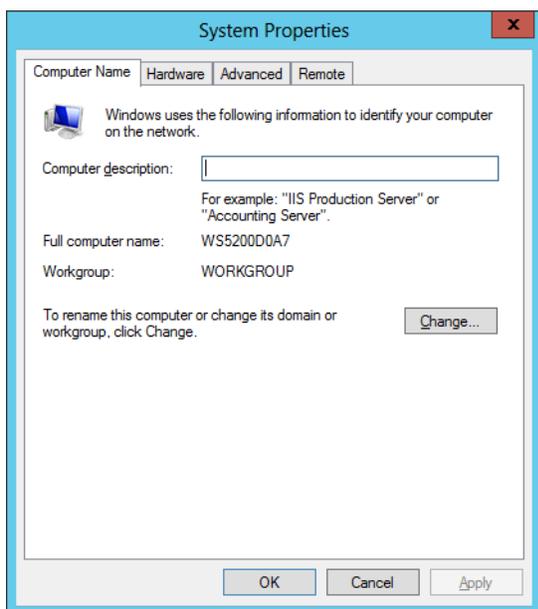
**Note:** To use DFS replication with Windows Storage Server, the TeraStation must join Active Directory domain.

### Joining an Active Directory

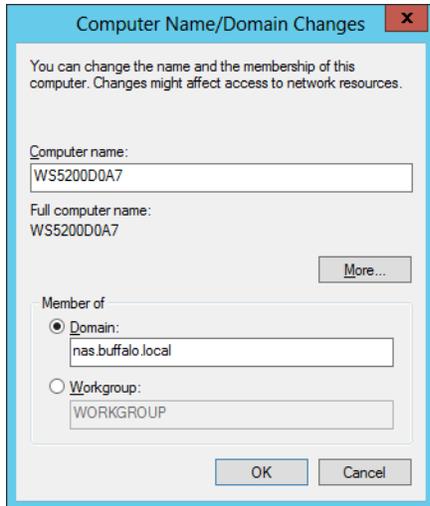
- 1 In Control Panel, go to *System* and click *Change settings* under "Computer name, domain, and workgroup settings".



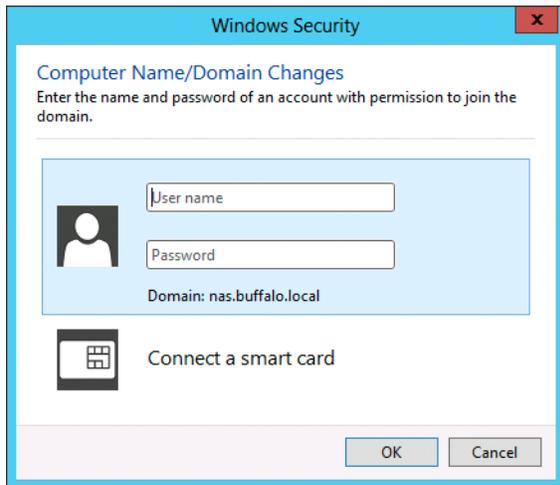
- 2 Click *Change*.



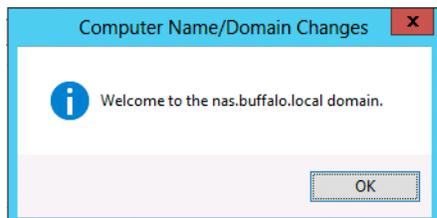
- 3 Select "Domain", enter a domain name, and click *OK*.



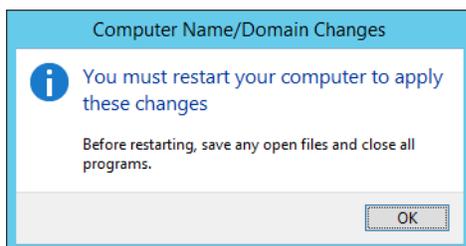
- 4 Enter an administrator username and password for the Active Directory domain controller.



- 5 Click *OK* when the following message is displayed.



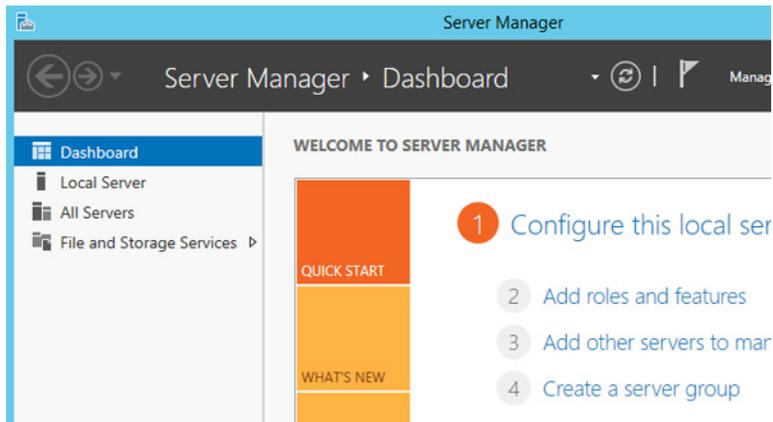
- 6 Click *OK* again.



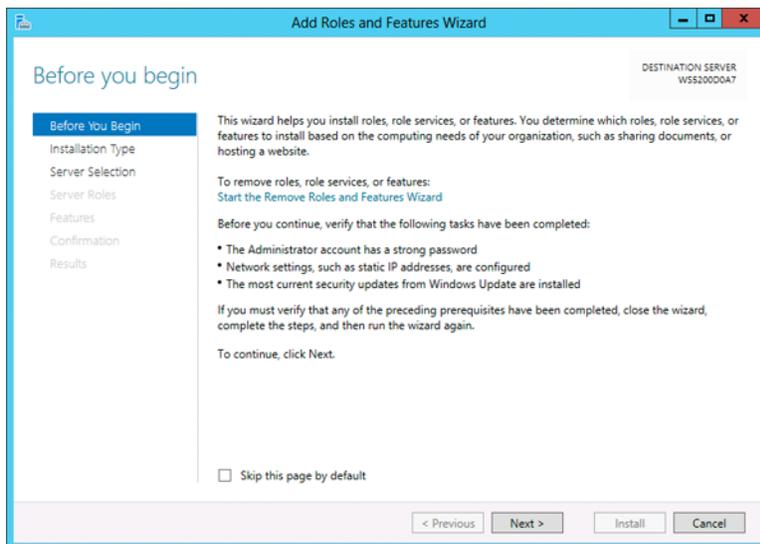
- 7 Click *Close*.
- 8 Click *Restart Now* and restart your computer to apply settings.

## Installing DFS

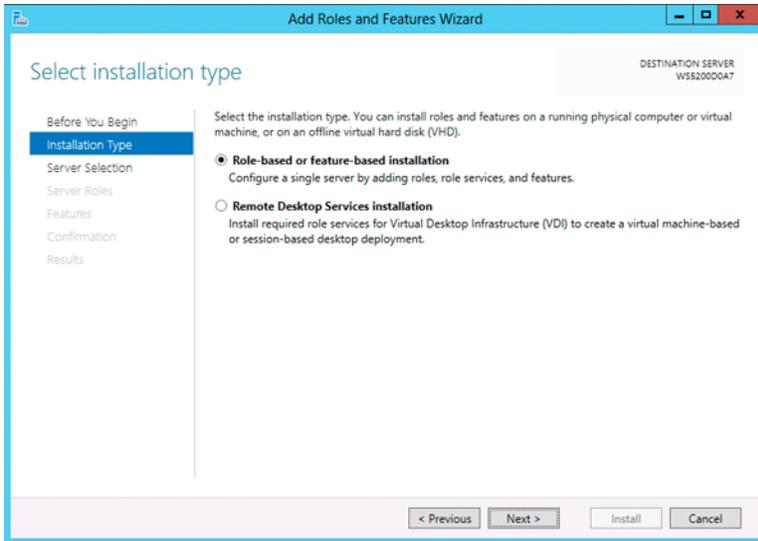
- 1 In Server Manager, click *Dashboard - Add roles and features*.



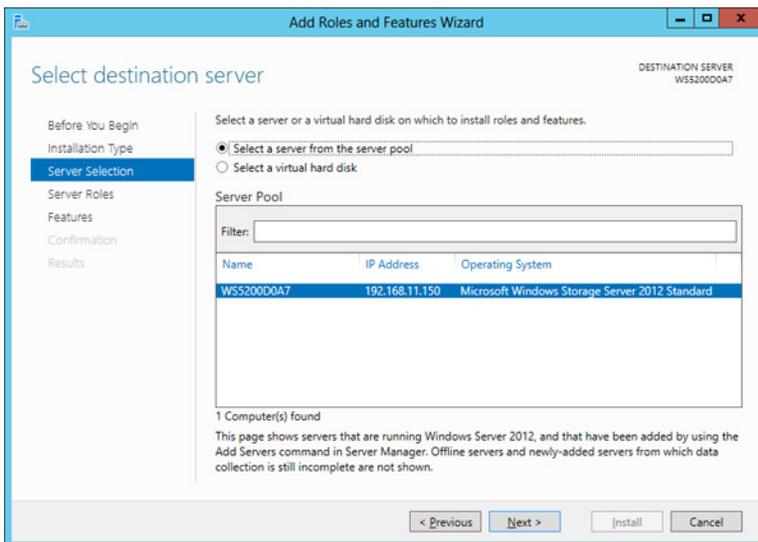
- 2 Click *Next*.



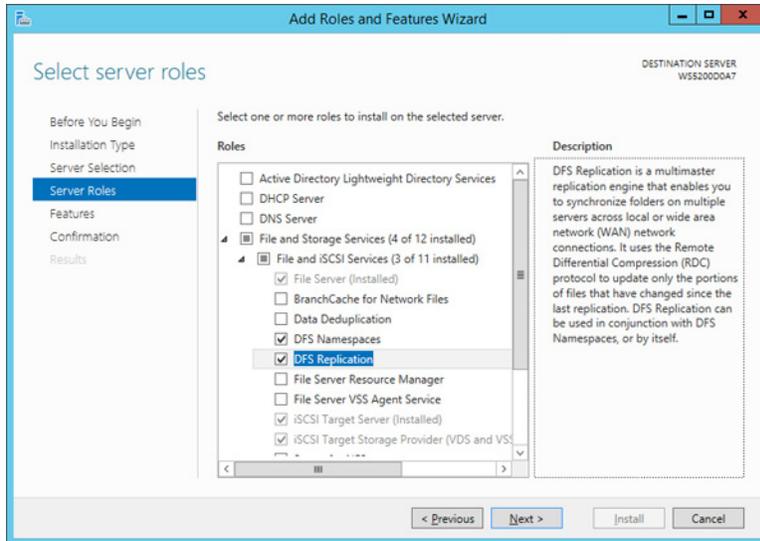
**3** Select "Role-based or feature-based installation" and click *Next*.



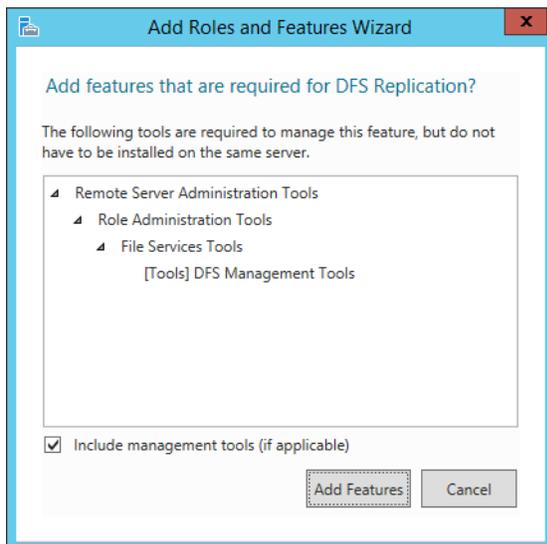
**4** Click *Next*.



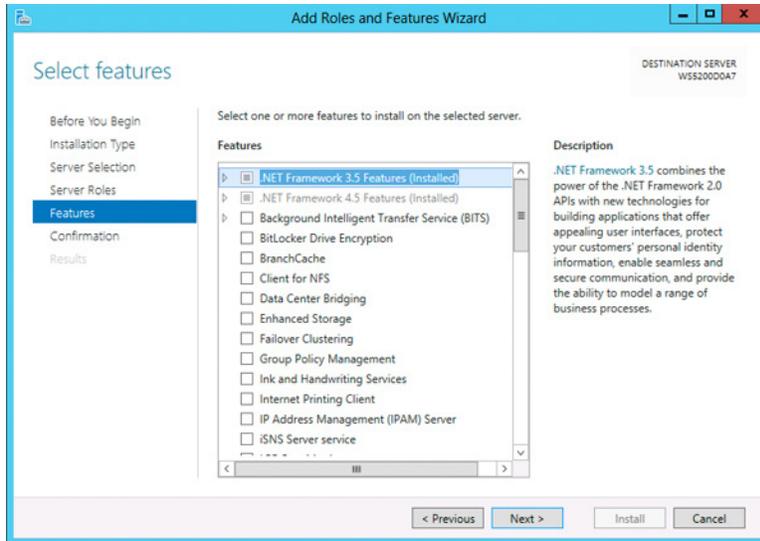
**5** Select "DFS Namespaces" and "DFS Replication" in "File and Storage Services" - "File and iSCSI Services".



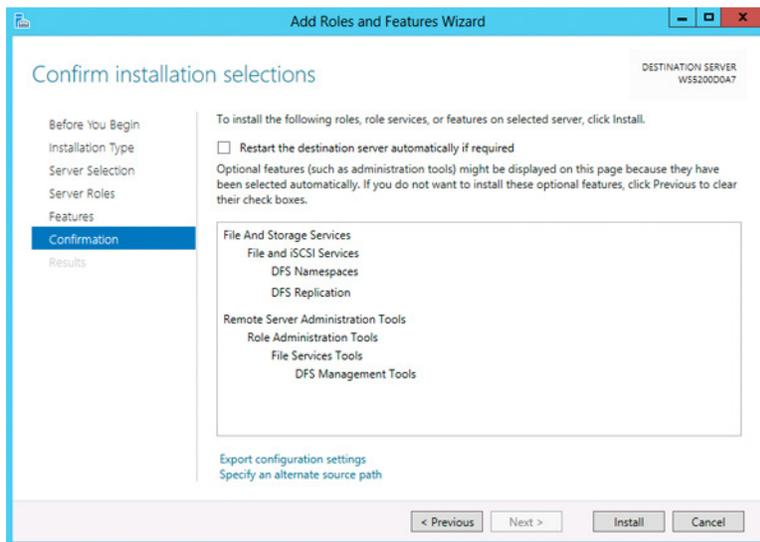
**6** Select "Include management tools (if applicable)" and click *Add Features*.



7 Click *Next*.



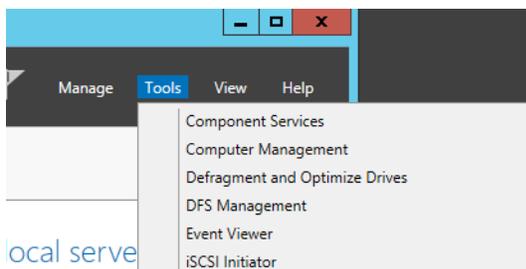
8 Click *Install*.



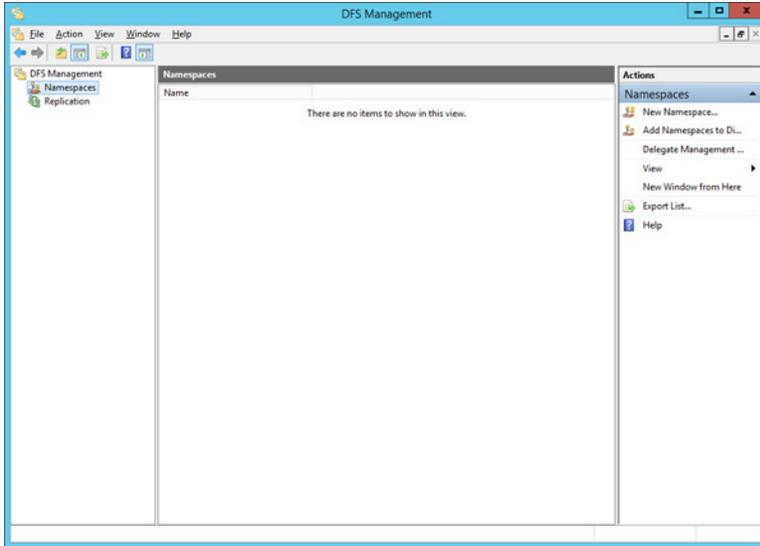
9 Click *Close* to finish.

## Creating Namespaces

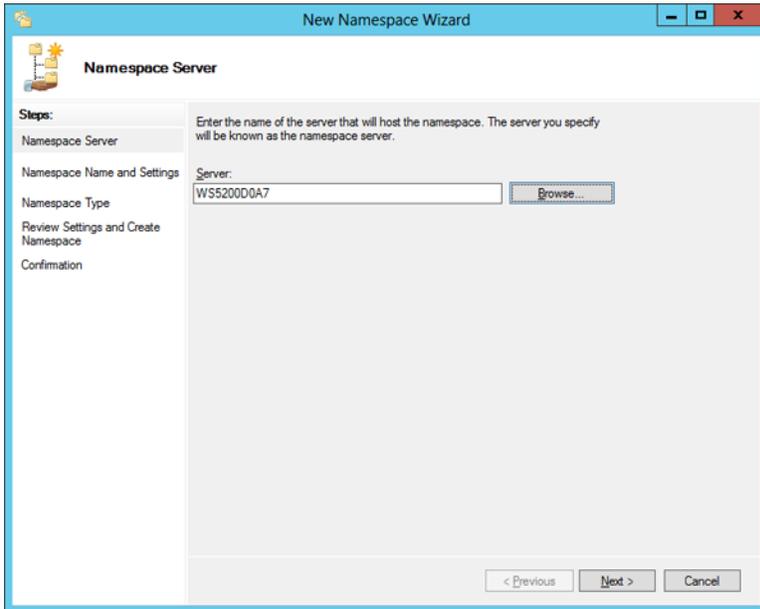
1 In Server Manager, click *Tools - DFS Management*.



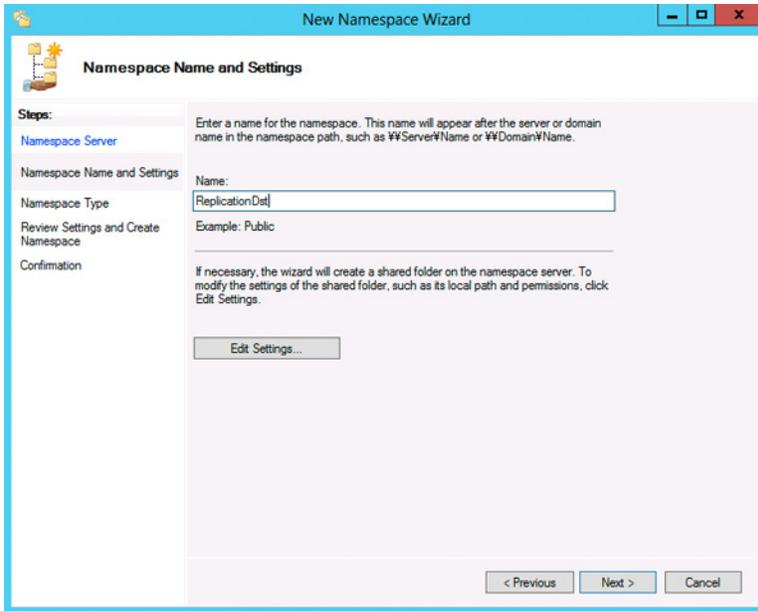
2 Click *Namespaces - New Namespace*.



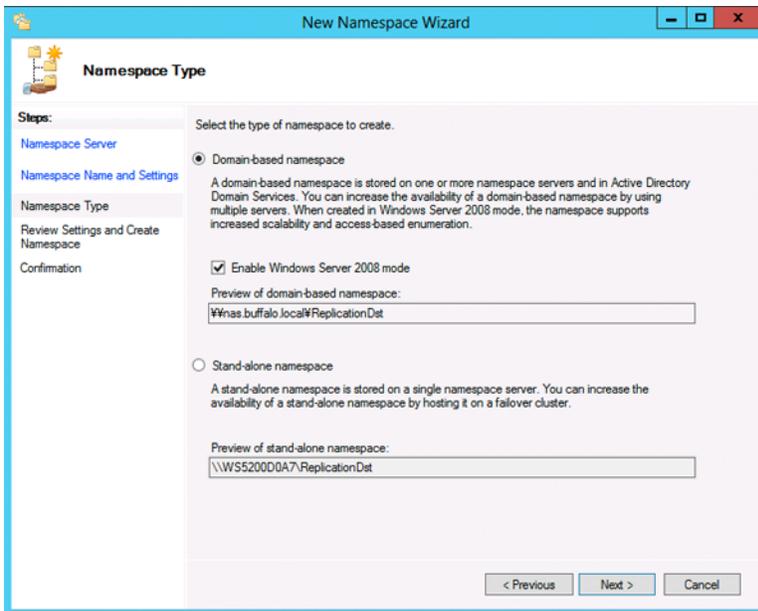
3 Enter a hostname for the namespace server and click *Next*.



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



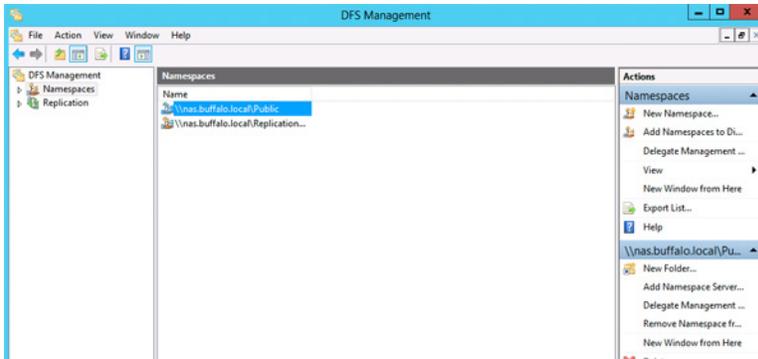
5 Select *Domain-based namespace* and click *Next*.



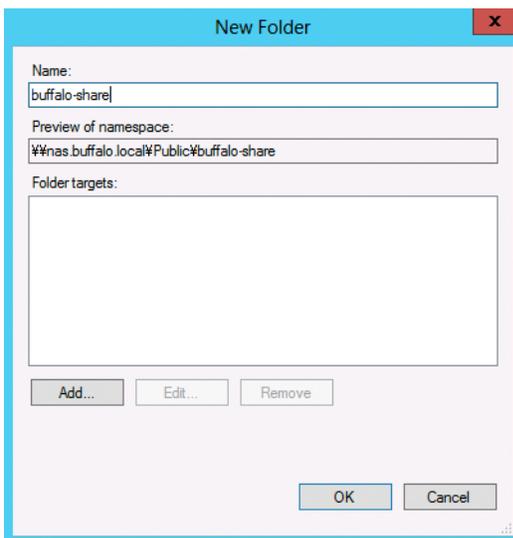
6 Click *Create*.

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

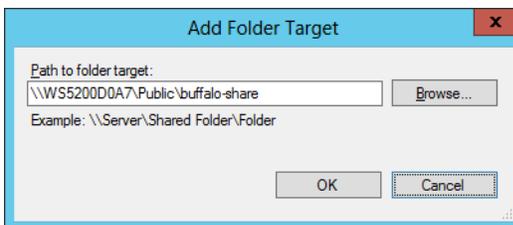
- 8 In DFS Management, click *Namespaces* and the name you created through the wizard. Then click *New Folder*.



- 9 Enter a folder name and click *OK*.

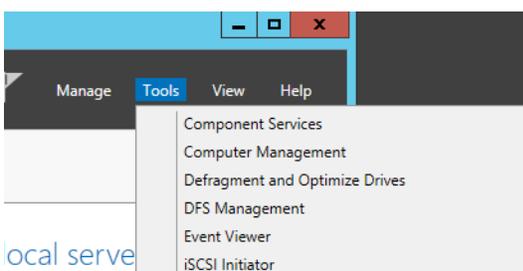


- 10 Enter a path to the folder or select from the list by clicking *Browse*. Click *OK*.

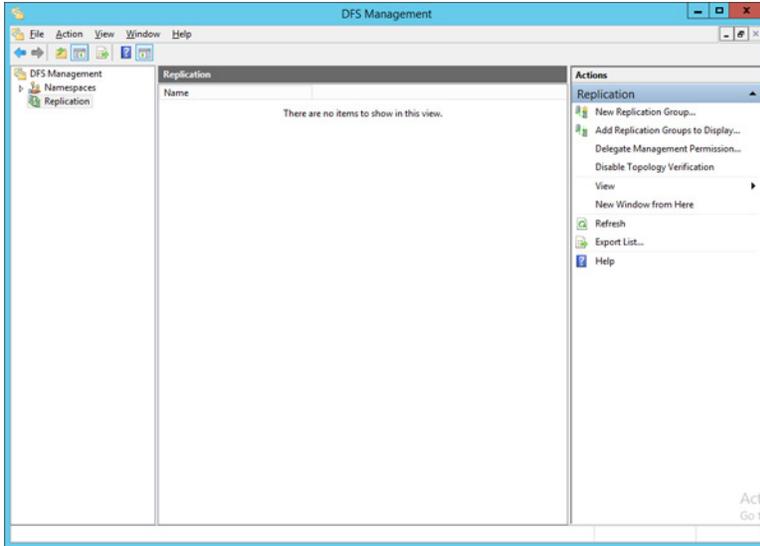


## Configuring DFS Replication

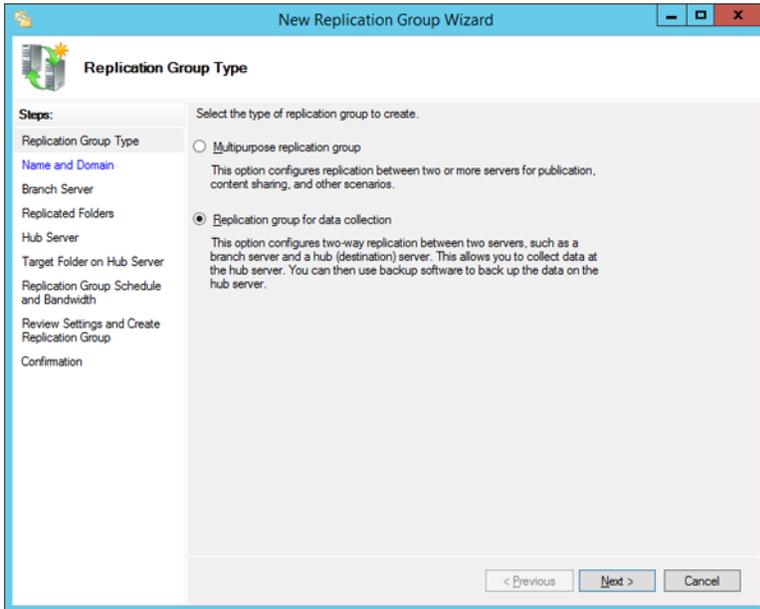
- 1 In Server Manager, click *Tools - DFS Management*.



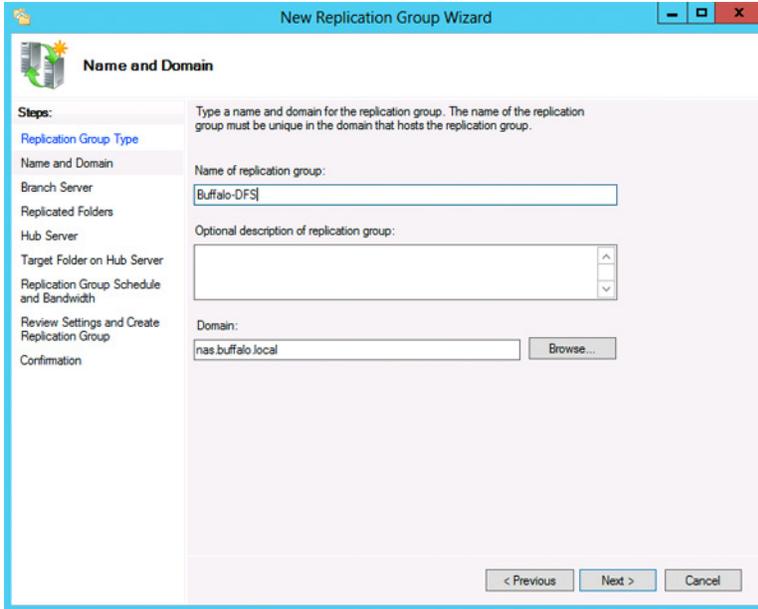
**2** Click *Replication - New Replication Group*.



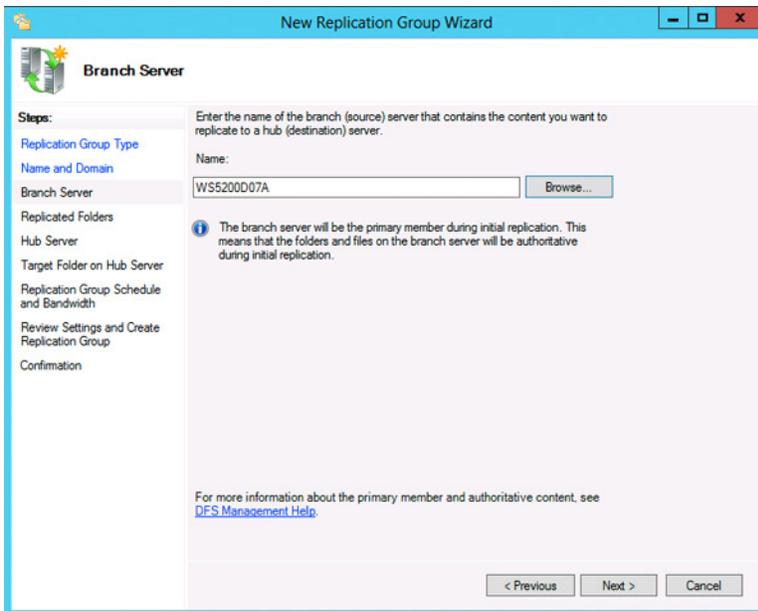
**3** Select the type of replication group and click *Next*.



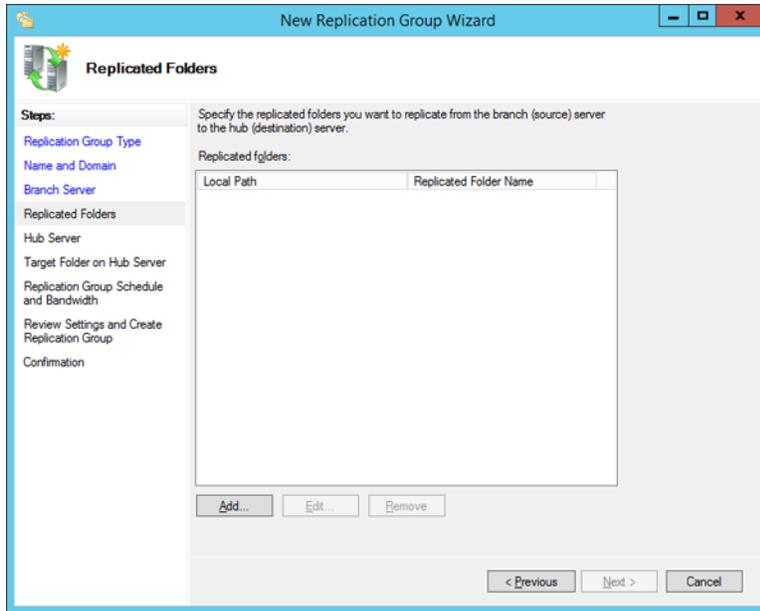
4 Enter a name for the replication group and click *Next*.



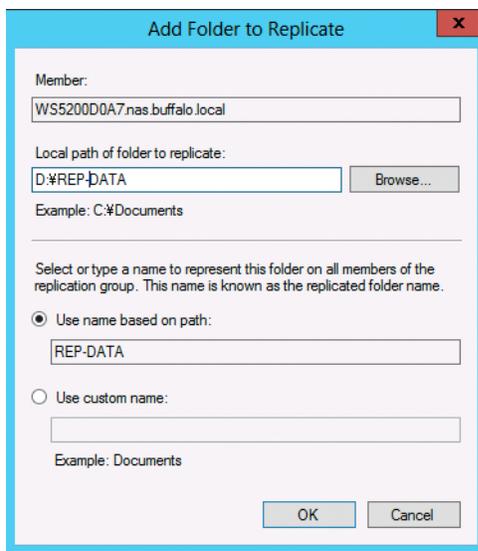
5 Enter the hostname of the file server for the replication source and click *Next*.



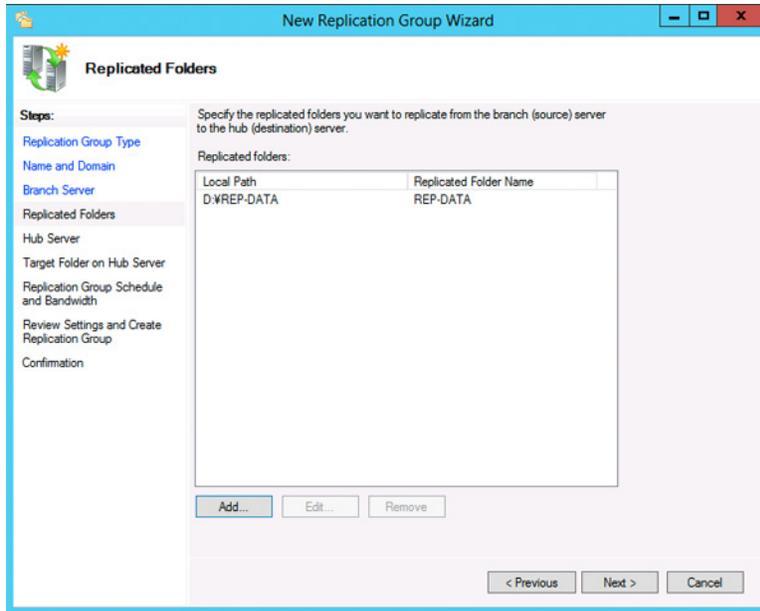
## 6 Click *Add*.



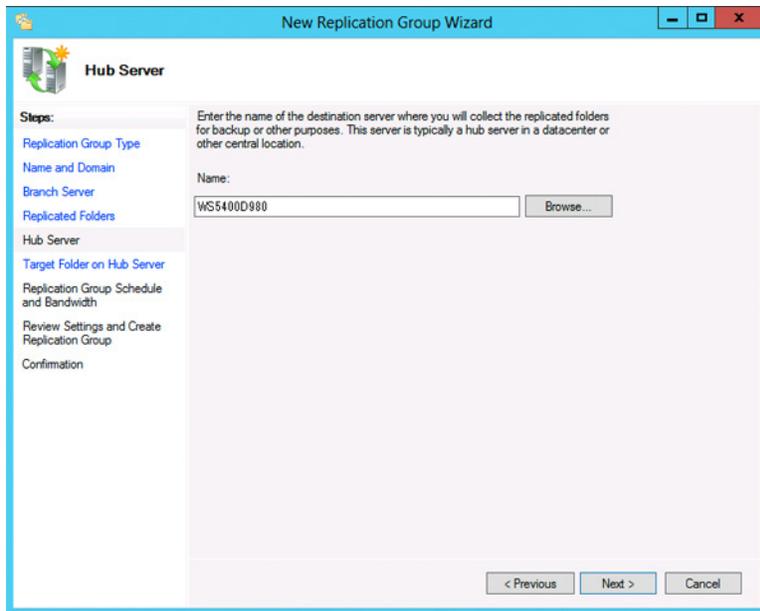
## 7 Enter the path of the replication source and click *OK*.



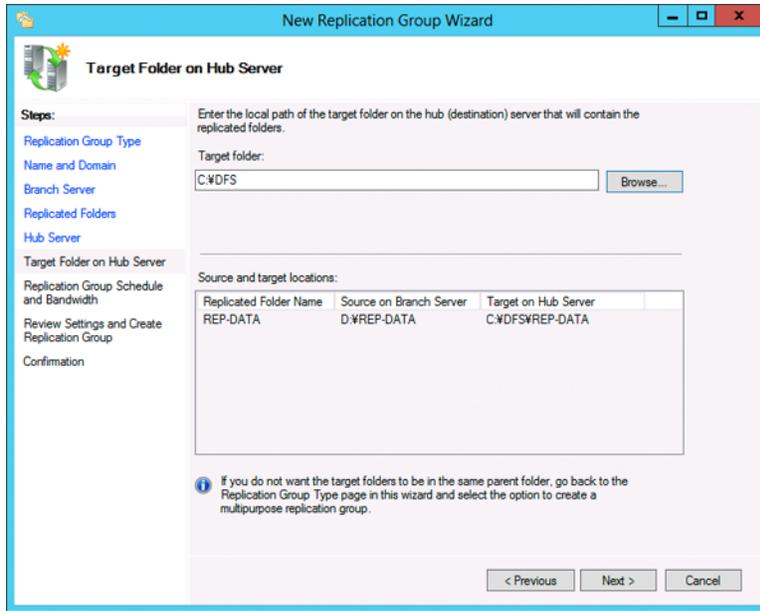
8 Click *Next*.



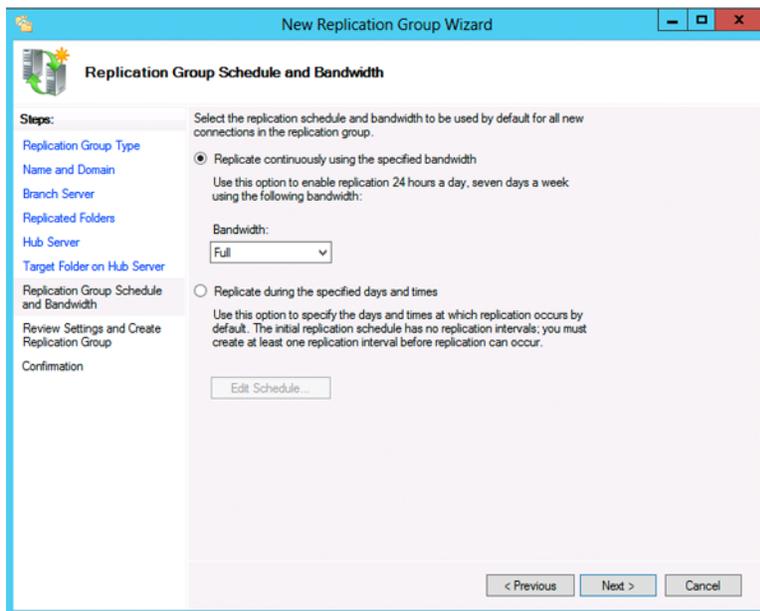
9 Enter the hostname of the file server for the replication target and click *Next*.



**10** Enter the path of the replication target. Alternatively, click *Browse* and select the folder from the list. Click *Next*.



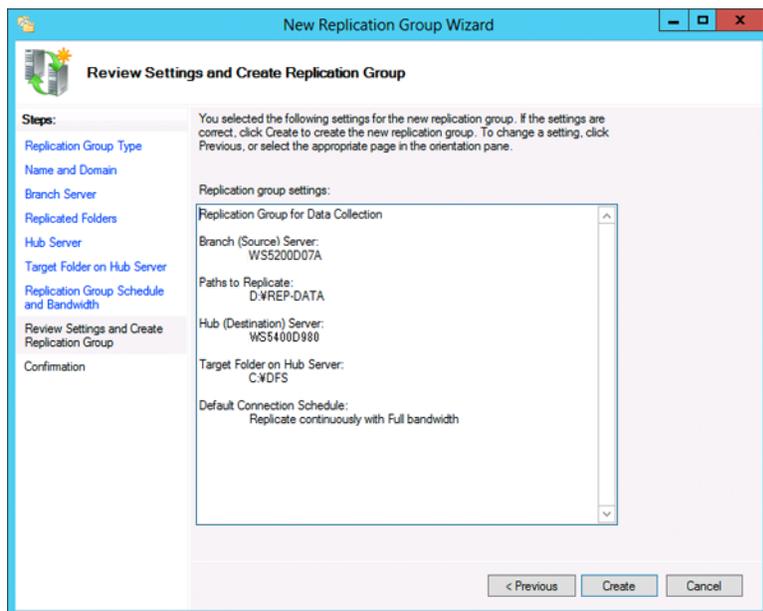
**11** Click *Next* again.



**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.

## 12 Click *Create*.



## 13 Click *Close* when finished. DFS replication is now configured.

**Note:** It may take some time before actual replication is caught up.

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# Back Up with NovaBACKUP

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

## Installation

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- 1 Connect the supplied USB device to your computer. Open the USB device and double-click *TSNavi.exe*. TeraNavigator will launch.
- 2 Click *Options - Additional Software Installation*.
- 3 Select "NovaBackup" and click *Install*.
- 4 Click *Install* again.
- 5 Check "Backup Client" and click *Install* on the NovaBACKUP installation wizard.
- 6 Select the installation language and click *Next* twice.
- 7 Check on "I accept the terms in the License Agreement", then click *Next*.
- 8 Select "Typical" and click *Next*.
- 9 Enter your name, company name, and email address. Select "I have a license key" and click *Next*.

**Notes:**

- Name, company name, and email address are required.
- Don't change the license key which is displayed on the screen.

**10** Click *Finish*.

NovaBACKUP is now installed. To launch NovaBACKUP, click the icon on your computer's desktop. For more detail information, click *View Help* in the NovaBackup Express Wizard or click *Help Topics* at the upper right of the NovaBACKUP home screen.

# Chapter 7 Settings

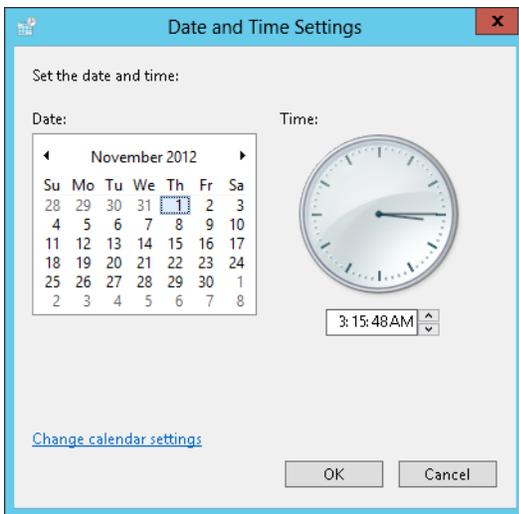
## Date and Time

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- 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*.

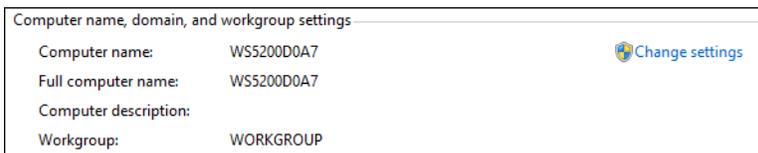


**Note:** In the *Internet Time* tab, click *Change settings*, then select *Synchronize with an Internet time server*. The date and time can be obtained automatically.

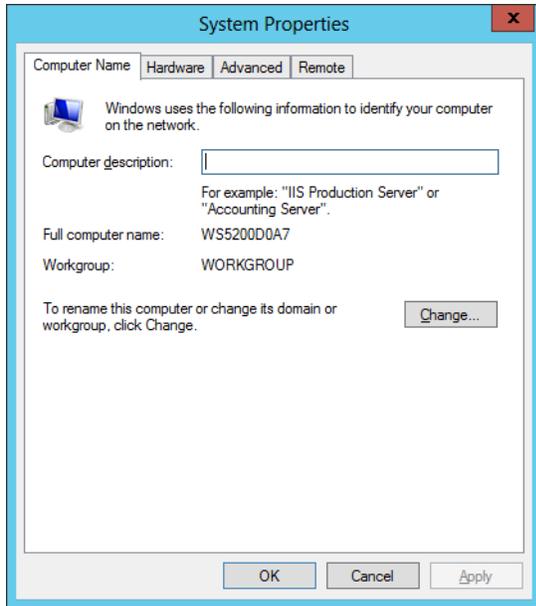
## Server Name, Workgroups, and Domains

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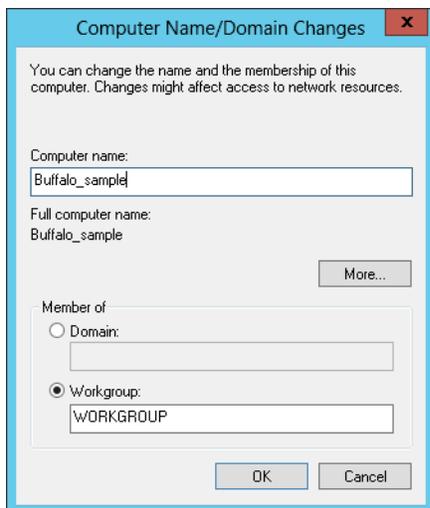
- 1 In Control Panel, go to *System* and click *Change settings* under "Computer name, domain, and workgroup settings".
- 2 Click *Change settings* under *Computer name, domain, and workgroup settings*.



- 3 In the *Computer Name* tab, click *Change*.



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



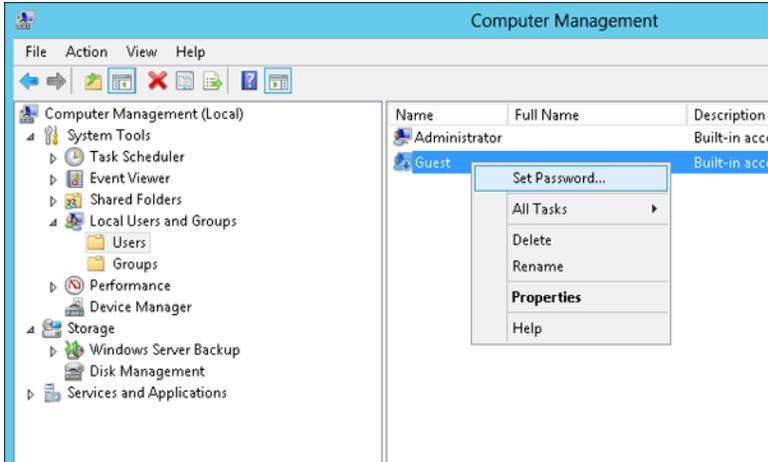
**Note:** The computer name should have 16 characters or less. If more than 16 characters are entered, all characters from the 17th character on are ignored.

## 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.

- 1 From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *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*.



- 4 Click *Proceed*.



- 5 Enter a new password (twice).

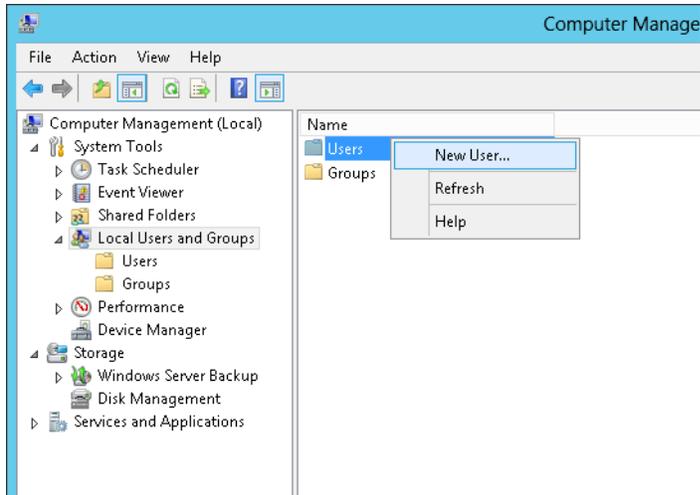


## Adding a User

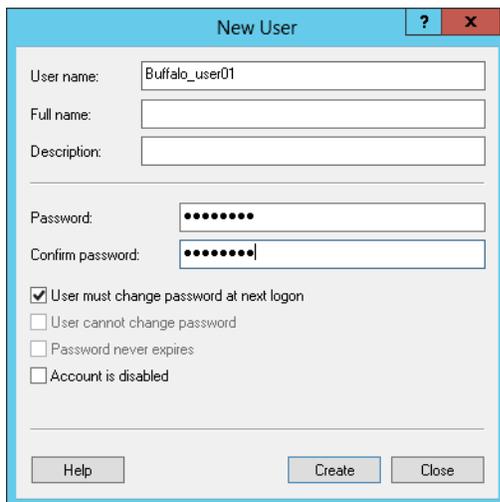
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- 1 From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.
- 2 Click *Local Users and Groups*.

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



- 4 Enter the desired settings and click *Create*.



- 5 Click *Close*.

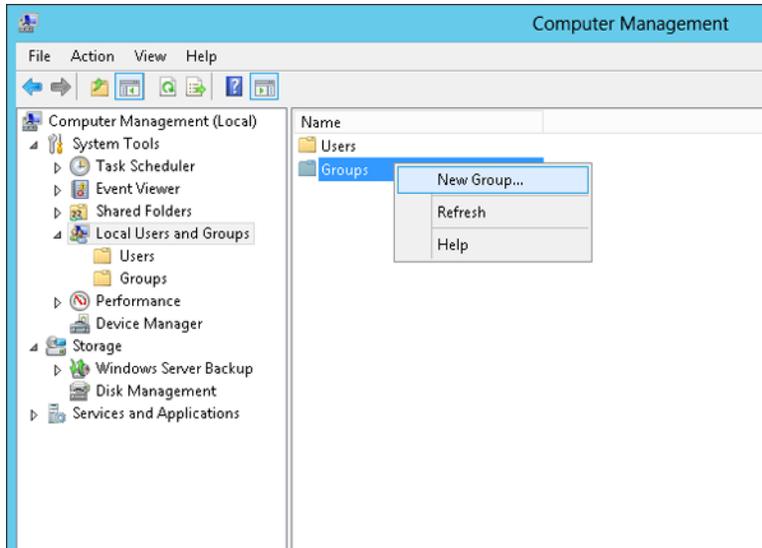
**Note:** Accounts not belonging to the Administrators group cannot be connected by the remote desktop.

## Adding a Group

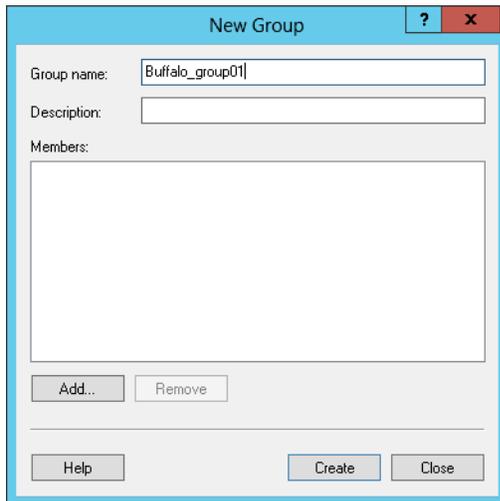
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- 1 From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.
- 2 Click *Local Users and Groups*.

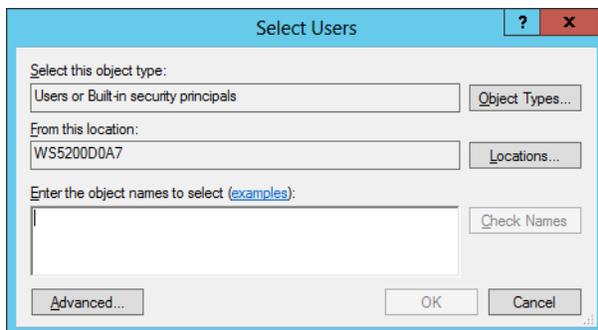
**3** Right-click *Groups* and choose *New Group*.



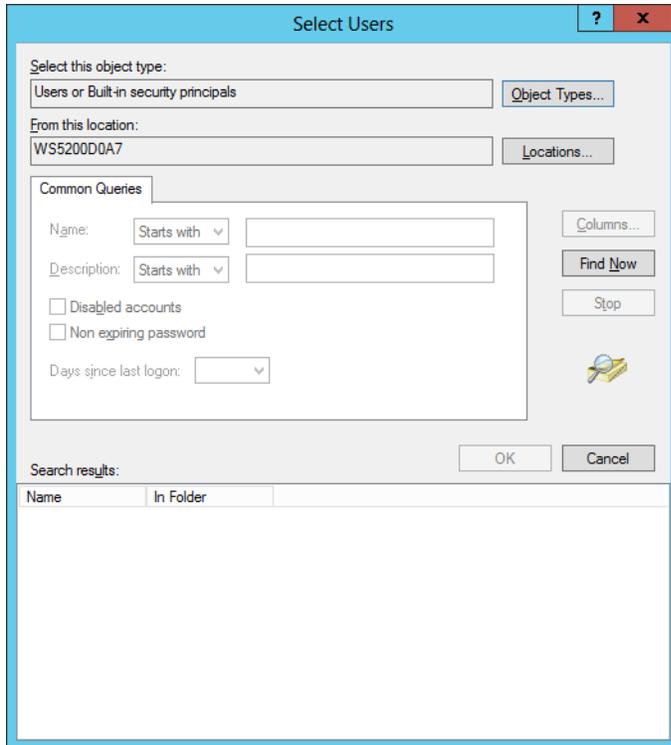
**4** Enter a group name and click *Add*.



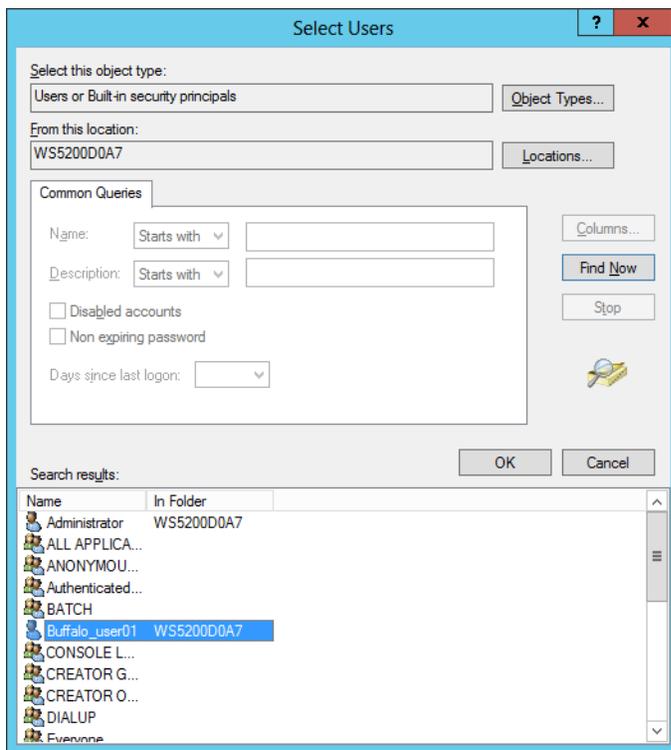
**5** Click *Advanced*.



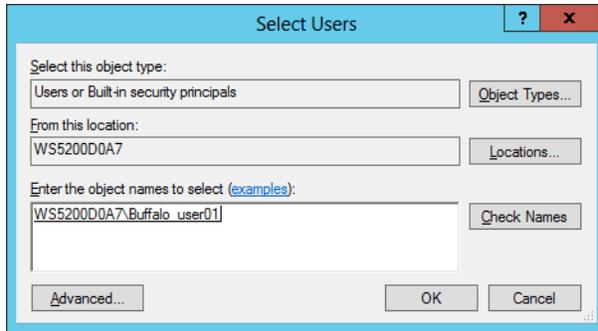
**6** Click *Find Now*.



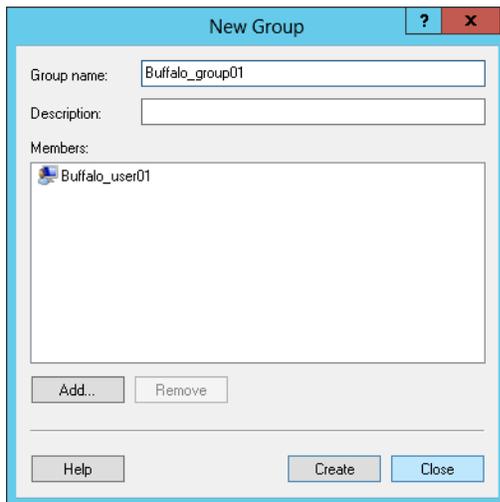
**7** Select the users to be registered to the group, then click *OK*.



**8** Click *OK*.



**9** Click *Create*.



**10** Click *Close*.

## Creating a Shared Folder

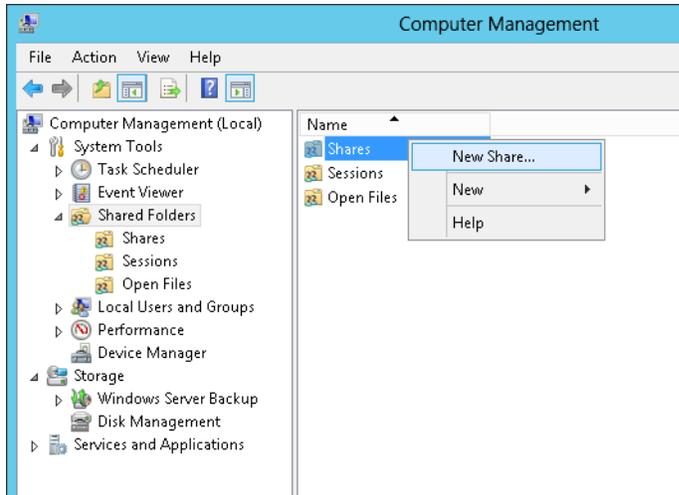
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No shared folders are configured by default. Before using the TeraStation, follow the procedure below to create one or more shared folders.

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

- 1** From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.
- 2** Click *Shared Folders*.

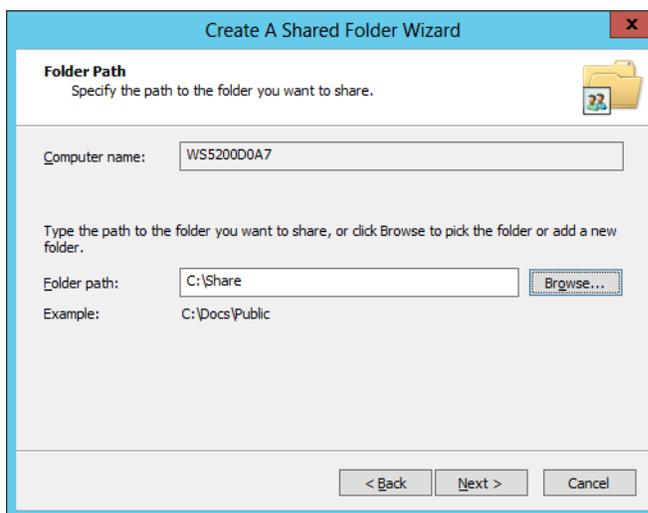
3 Right-click *Shares* and click *New Share*.



4 Click *Next*.



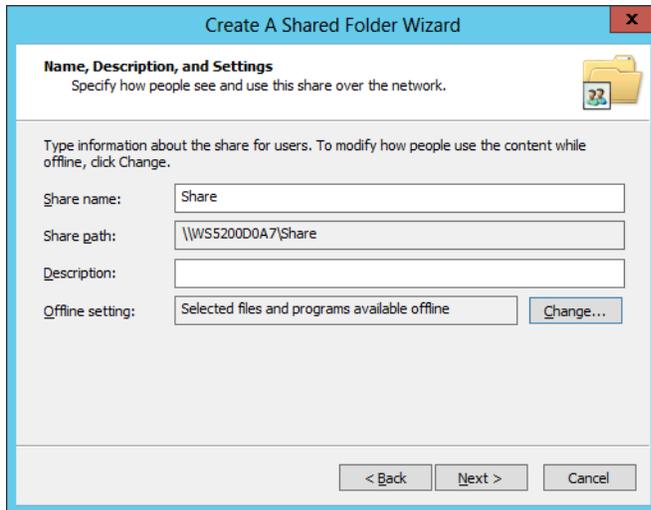
5 Enter the path of an existing folder or a new folder, then click *Next*.



**Notes:**

- Enter "D:\Share" in 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.

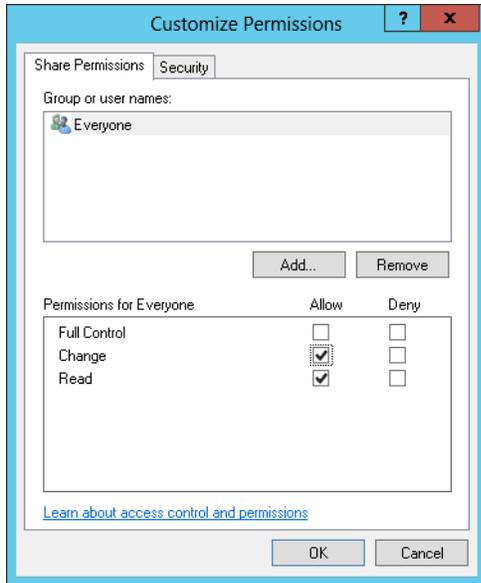
**6** Enter a name for the share and a description (optional), then click *Next*.



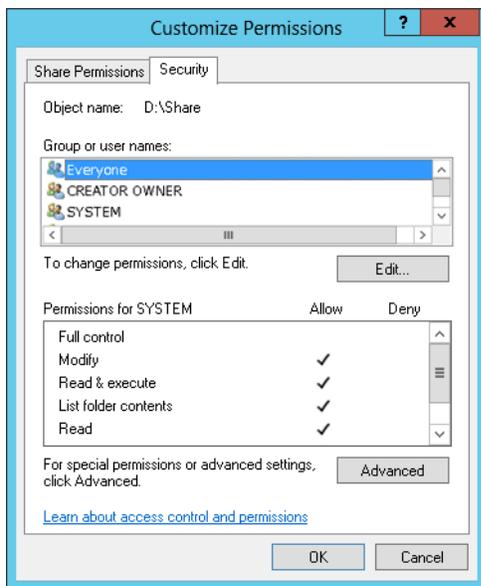
**7** Check *Customize permissions*, then click *Custom*.



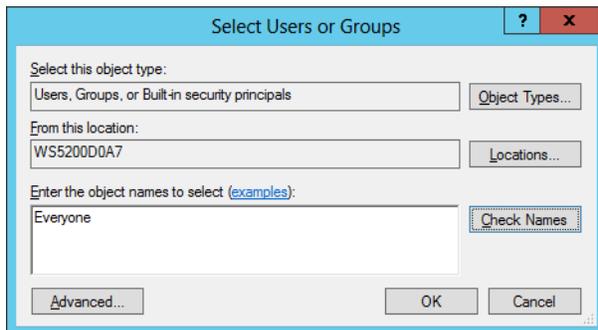
8 Choose *Everyone* and check *Allow* for "Change".



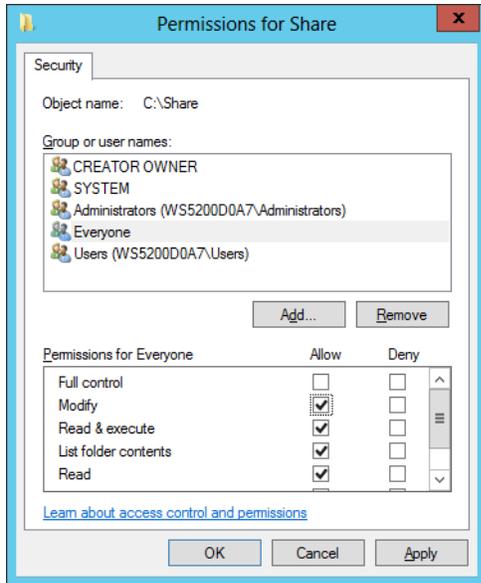
9 In the *Security* tab, click *Edit - Add*.



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



**11** Choose "Everyone", then check *Allow for Modify*.



**12** Click *OK - OK - Finish - Finish*.

**13** Click *Local Users and Groups* in *Computer Management*.

**14** Double-click *Users - Guest*.

**15** In the *General* tab, uncheck *Account is disabled*, then click *OK*.

**Notes:**

**Enable a guest account:**

- (1) From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.
- (2) Click *Local Users and Groups*.
- (3) Double-click *Users - Guest*.
- (4) In the *General* tab, uncheck *Account is disabled*, then click *OK*.

**Enable access permissions:**

- (1) From the Windows Storage Server Start menu, open *Administrative Tools*, then double-click *Computer Management*.
- (2) Click *Shared Folders*.
- (3) Double-click *Shared*, then the shared folder.
- (4) In 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 by all users, add a guest and change "Administrators Access permission" to "Full Control".

## Email Notification

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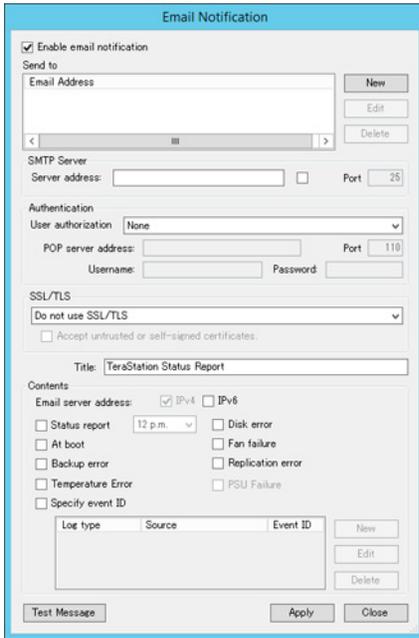
Your TeraStation can send you email reports daily, or when settings are changed or an error occurs. Notification emails may be triggered by any of the following events:

- Hard drive status at scheduled time

- Hard drive read error
- TeraStation booted
- Fan error
- Temperature exceeded
- Specified event ID logged

**1** From the Windows Storage Server Start menu, click *Email Notification*.

**2** Check "Enable email notification".



**3** Click *New* and enter an email address. You may enter up to five email addresses to receive notifications.

**4** Enter your mail server settings and choose what events will trigger notification. Click *Apply* to finish the email notification settings. You can send a test email when clicking *Test Message*.

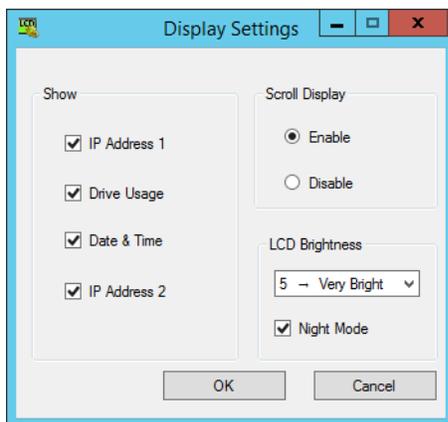
Items	Descriptions
Enable email notification	If enabled, email reports will be sent during specific events.
Send to	Adds a new receiver for the notification email. Click <i>New</i> to add a new email address. Click <i>Edit</i> to change the receiver settings or <i>Delete</i> to remove an address from the list. <b>Note:</b> Up to 5 email address may be added.
SMTP Server	Enter your email SMTP server's address and port number. Port number 25 is configured by default. <b>Note:</b> If you choose "None" or "POP before SMTP" for the user authorization, the port number is locked to "25".
Authentication	Select the user authorization type from "None", "POP before SMTP", "LOGIN (SMTP-AUTH/LOGIN)", and "CRAMMD5 (SMTP-AUTH/CRAM-MD5)". If "POP before SMTP" is selected, enter the POP server address, port number, username, and password. Unless specified otherwise, the standard port number (110) is used.
SSL/TLS	If "LOGIN (SMTP-AUTH/LOGIN)" or "CRAMMD5 (SMTP-AUTH/CRAM-MD5)" is selected, select whether to use SSL or TLS.

Items	Descriptions
Title	Enter the subject of the notification email.
Contents	Email server address: Check "IPv6" to add IPv6 compatibility to the email notifications. Select the event that will trigger the notification emails to be sent. Status report: Sends regular notification emails at the specified time. Disk error: Sends an email when a hard drive error occurs. At boot: Sends an email when the system is booted or restarted. Fan failure: Sends an email when a fan error occurs. Temperature error: Sends an email when the TeraStation temperature exceeds normal levels. Specify event ID: Sends an email when the specified event IDs are logged. Enter an event ID to trigger email notifications.
Test Message	Sends a test email to the email address which is configured.

## LCD Display Settings

You may configure the LCD on the front of the TeraStation.

- 1 From the Windows Storage Server Start menu, click *Display Settings*.
- 2 Configure the desired settings and click *OK*.



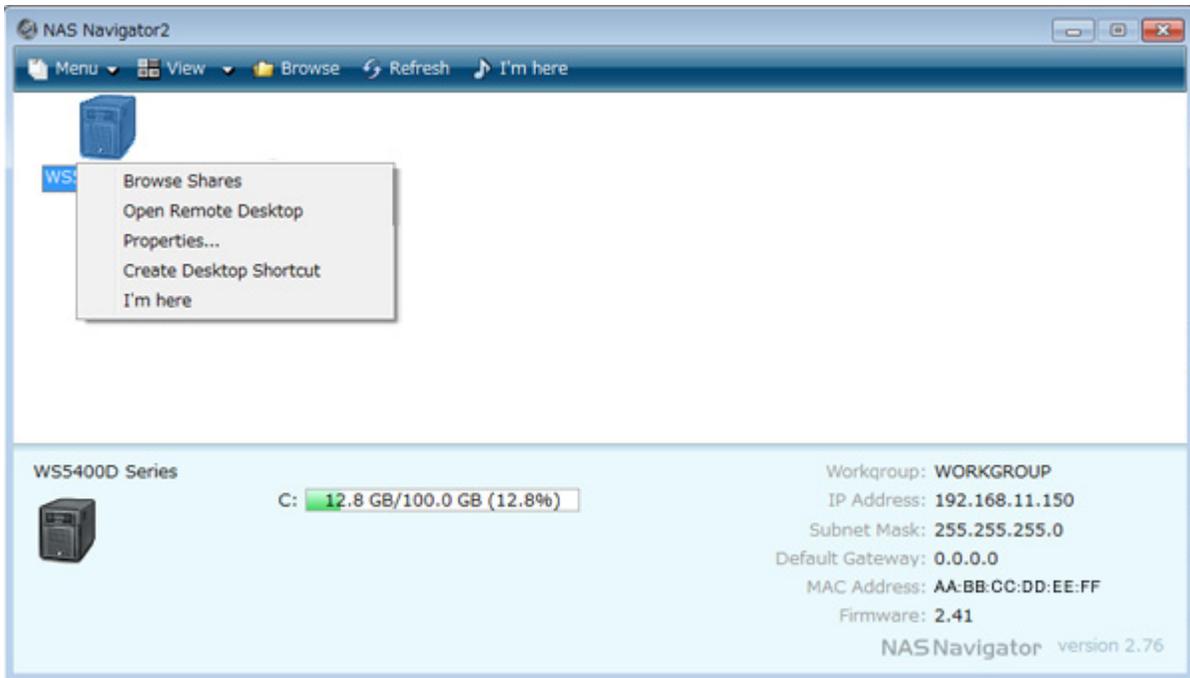
Items	Descriptions
Show	Select the item(s) to be displayed on the LCD display.
Scroll Display	If enabled, the LCD scrolls through display items at a regular interval.
LCD Brightness	Change the brightness of the LCD display from level 1 (darkest) to 5 (brightest).
Night Mode	If checked, the LCD brightness will be set at level 2 (dark) from 6 pm to 8:59 am the next day. <b>Note:</b> If the LCD brightness is already set to level 1 (darkest) or level 2 (dark), night mode will be grayed out and cannot be selected.

## Changing the IP Address

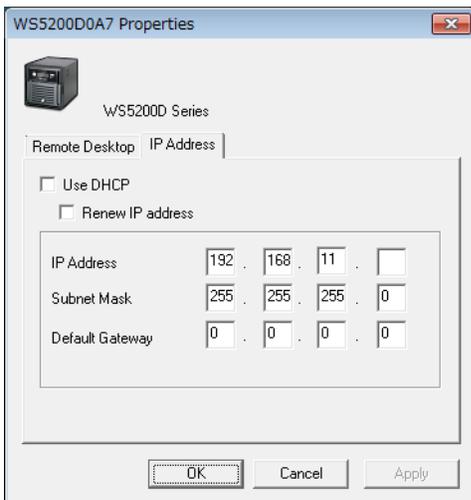
**Note:** If the TeraStation is being used in a domain environment, the IP address cannot be changed by NAS Navigator2. To change the IP address, the domain environment administrator must change it at the domain server.

- 1 Right-click on your TeraStation's icon and click *Properties*.

For Mac OS, click the TeraStation icon while holding down the control key, then click *Configure*.



**2** Click the *IP Address* tab, enter the desired settings, and click *OK*.



**Notes:**

- If you don't know how to configure these settings, check "Use DHCP".
- If you are prompted to enter the administrator's password, enter the TeraStation's password (it is set to "password" by factory default).

# Chapter 8 NAS Navigator2

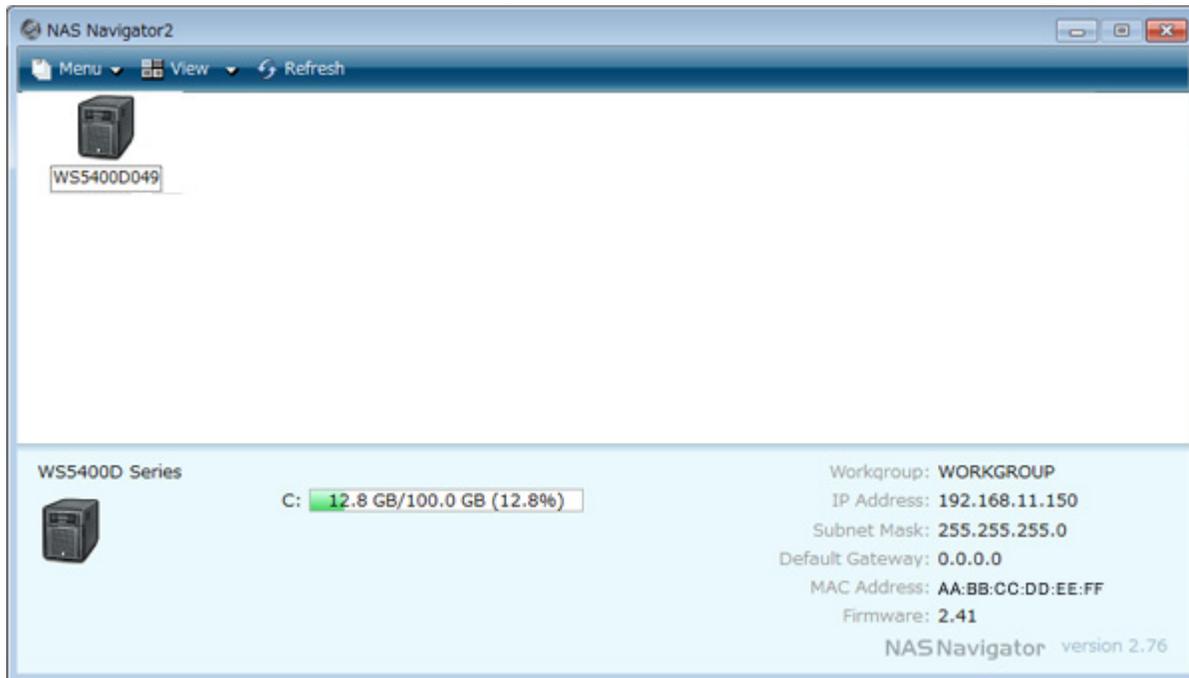
## NAS Navigator2 for Windows

NAS Navigator2 is a utility program that makes it easy to display Windows Storage Server, change the TeraStation's IP address, or check its hard drive in remote desktop. If you installed the TeraStation with the TeraNavigator, NAS Navigator2 was installed automatically.

NAS Navigator2 will run in the system tray when the computer is on.



Double-click the  icon to start NAS Navigator2.



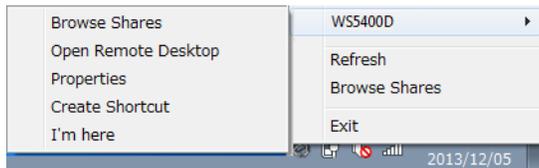
Click your TeraStation's icon to open a share on the TeraStation and display:

- Total capacity
- Capacity in use
- IP address
- Workgroup
- Subnet mask
- Default gateway
- MAC address
- Firmware version

Name		Description
Menu	Map Share*	Not available for this product (grayed out).
	Disconnect Share*	Not available for this product (grayed out).
	Map All Remote Shares to Drive Letters	Assigns all the TeraStation's shared folders as network drives. This is available only when a shared folder has been created.
	Create Desktop Shortcut*	Creates a shortcut icon to the TeraStation's shared folder "share" on the desktop.
	Launch NAS Navigator2 on Startup	Launches NAS Navigator2 in the system tray when Windows boots.
	Display Errors	If an error occurs, an error message will pop up from the NAS Navigator2 icon in the system tray.
	Properties*	Opens the selected TeraStation's properties page.
	Close	Closes NAS Navigator2.
View	View	Icons: Displays icons. Details: Displays hostname, product name, workgroup, IP address, subnet mask, and default gateway.
	Sort by	Select the sort order from following to display when multiple NAS are found: Hostname, product name, workgroup, IP address, subnet mask, and default gateway.
Browse*		Opens the TeraStation's shared folder.
Refresh		Searches for NAS devices on the network again.
I'm here*		Causes your TeraStation to beep.
Right-click your device's icon to show these options.	Browse Shares	Opens the TeraStation's shared folder.
	Open Remote Desktop	Opens Windows Storage Server in remote desktop.
	Properties	Opens the TeraStation's properties page.
	Create Desktop Shortcut	Creates a shortcut icon to the TeraStation's shared folder "share" on the desktop.
	I'm here	Causes your TeraStation to beep.

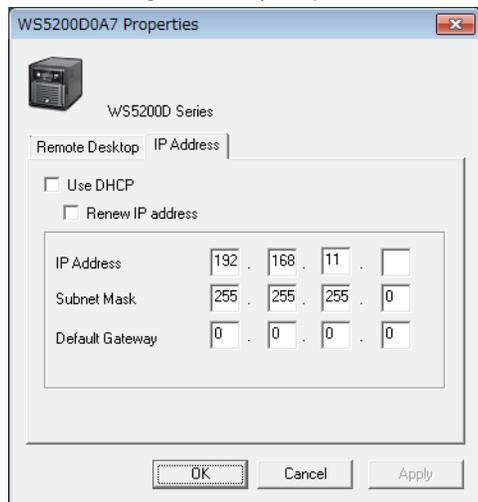
\*Click on the TeraStation's icon to display these options.

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



Name		Description
TeraStation Name	Browse Shares	Opens the TeraStation's shared folder.
	Open Remote Desktop	Opens Windows Storage Server in remote desktop.
	Properties	Opens the TeraStation's properties page.
	Create Desktop Shortcut	Creates a shortcut icon to the TeraStation's shared folder "share" on the desktop.
	I'm here	Causes your TeraStation to beep.
Refresh		Refreshes list of NAS devices.
Browse Shares		Displays NAS Navigator2 window.
Exit		Exits NAS Navigator2.

The following tasks may be performed from the TeraStation's properties page.

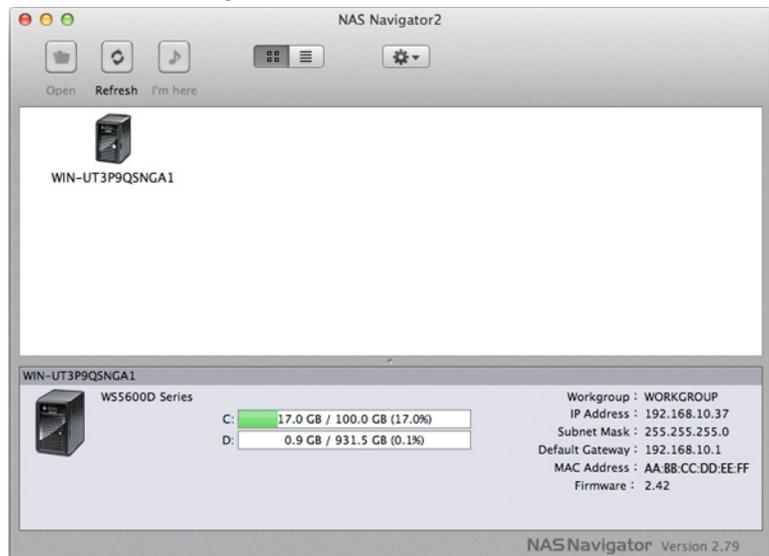


Name	Description
Remote Desktop	Click <i>Open Remote Desktop</i> to open Windows Storage Server.
IP Address	Check <i>Use DHCP</i> to assign an IP address automatically. If there is no DHCP server in the network, you cannot use this function. Check <i>Renew IP address</i> to obtain an IP address from DHCP server. You can manually enter an IP address, subnet mask, and default gateway.

## NAS Navigator2 for Mac

NAS Navigator2 is a utility program that makes it easy to display Windows Storage Server, change the TeraStation's IP address, or check its hard drive in remote desktop. If you installed the TeraStation with the TeraNavigator, NAS Navigator2 was installed automatically.

To launch NAS Navigator2, click the  icon in the Dock.



Click on a TeraStation's icon to display:

- Total capacity
- Used capacity

- Workgroup
- IP address
- Subnet mask
- Default gateway
- MAC address
- Firmware version

Double-click it to open a share on the TeraStation.

Name		Description
Open		Opens the default shared folder for a selected TeraStation.
Refresh		Searches for NAS devices on the network again.
I'm here		Causes your TeraStation to beep.
Open Remote Desktop		Opens Windows Storage Server in remote desktop.
Configure		Opens the TeraStation's properties page.
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 TeraStations and LinkStations on the network on and off automatically.
To display these options, hold down the control key and select your TeraStation's icon.	Open Folder	Opens the TeraStation's shared folder.
	Open Remote Desktop	Opens Windows Storage Server in remote desktop.
	Configure	Opens the TeraStation's properties page.
	I'm here	Causes your TeraStation to beep.
	Label Color	Selects the color of the name displayed below the icon. The menu below is displayed when you click the TeraStation icon while holding down the control key.

# Chapter 9 Appendix

## LCD Display

The LCD display can be cycled through different modes by pressing the display button on the front of the TeraStation.

### Modes

LCD Message		Description
Link Speed <b>Note:</b> When an Ethernet cable is connected to LAN Port 2, "LINK SPEED 2" is displayed.	LINK SPEED No LINK	Not connected to network.
	LINK SPEED 10Mbps	Connected at 10 Mbps.
	LINK SPEED 100Mbps	Connected at 100 Mbps.
	LINK SPEED 1000Mbps	Connected at 1000 Mbps full duplex.
Disk Space Used	HDD USED 	Bar graphs are shown to indicate the used space for the C, D, E, and F internal drives of the TeraStation. When a hard drive is full, it is indicated by "^".
Hostname/IP Address	WS5000xxx 192.168.11.150	Displays the hostname and IP address. <b>Note:</b> If the hostname contains multibyte characters, they will be replaced with question marks (?) on the LCD display.
Calendar/Clock	DATE TIME 2012/1/1 11:11	Displays the date and time set in the TeraStation.
Installed OS	Windows Storage Server 2012	Displays the OS installed on the TeraStation.
IP Address 2	NETWORK2 192.168.11.151	Displays the IP address of LAN port 2 when an Ethernet cable is connected to LAN port 2.

### Errors and Status

LCD 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 tool to remove them. If the error is displayed again, contact Buffalo technical support for assistance.

LCD Message	Description	Corrective Action
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 hard drive X.	Hard drive X may be disconnected or may have failed. After shutting down, reinstall the hard drive.
HDx Broken E30 Replace the DISK	An error occurred, so hard drive X was removed from the RAID array.	Replace hard drive X.
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 hard drive. For replacing method, refer to the "Hard Drive Replacement Procedure" section in chapter 5.
RAID I18 X Drive Rebuilding	Rebuilding drive X in the array. <b>Note:</b> Transfer speeds are slower during the rebuilding process.	Wait until the RAID 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 the RAID 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.
I54 Backup Failure	A backup job has failed.	Make sure that the backup job is configured correctly, and that the NAS is on and not in standby mode. If the backup job still fails, check the status of NAS, network, and backup source and destinations. Also, check the backup log to see if any errors were recorded.

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## Default Settings

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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.

DHCP Client	Normally, the TeraStation will get its IP address automatically from a DHCP server on the network. If no DHCP server is available, then an IP address will be assigned as follows: IP Address: 169.254.xxx.xxx (xxx is assigned randomly when booting the TeraStation). Subnet Mask: 255.255.0.0
Registered Group	Windows Storage Server's default groups are registered.
Microsoft Network Group Setting	WORKGROUP
RAID Mode	Drive C: A mirrored array using drives 1 and 2 Drive D: A RAID 5 array using all drives* *WS5200D: Drive D is a mirrored array using drives 1 and 2.
Local Security Policy	"Password must meet complexity requirements" is disabled by default.

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## Specifications

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Check the Buffalo website for information about the latest products and specifications.

Installed System	Workgroup Edition Model: Microsoft Windows Storage Server 2012 Workgroup Edition Standard Edition Model: Microsoft Windows Storage Server 2012 Standard Edition <b>Note:</b> The Microsoft Software License is contained in the <i>ms-license</i> folder in the supplied USB device. Be sure to read the terms and conditions of this license.	
LAN Port	Interface	IEEE 802.3ab (1000BASE-T) IEEE 802.3u (100BASE-TX) IEEE 802.3 (10BASE-T)
	Transfer Speed	1000 Mbps full duplex (auto-negotiation) 100 Mbps full duplex/half duplex (auto-negotiation) 10 Mbps full duplex/half duplex (auto-negotiation)
	Number of Ports	2 ports (supports Auto-MDIX)
	Connector Type	RJ-45 8-pin
USB Port	WS5600D, WS5400R: USB 2.0 Port (Series A) x 2, USB 3.0 Port (Series A) x 3 WS5400D, WS5200D: USB 2.0 Port (Series A) x 2, USB 3.0 Port (Series A) x 2	
UPS Port	D-sub 9 pin (male) x 1 Compatible UPS are manufactured by Omron or APC.	
Internal Hard Drive	If a hard drive in the TeraStation malfunctions, replace it with a Buffalo OP-HDS series drive of the same capacity, available from the Buffalo website.	
Power Supply	AC 100–240 V, 50/60 Hz	
Dimensions (W x H x D)	WS5600D: 170 x 260 x 230 mm; 6.7" x 10.2" x 9.1" WS5400R: 430 x 44 x 430 mm; 16.9" x 1.7" x 16.9" WS5400D: 170 x 215 x 230 mm; 6.7" x 8.5" x 9.1" WS5200D: 170 x 170 x 230 mm; 6.7" x 6.7" x 9.1"	

Weight	WS5600D: 10.0 kg; 22.1 lb WS5400R: 9.0 kg; 19.8 lb WS5400D: 7.5 kg; 16.5 lb WS5200D: 4.0 kg; 8.8 lb.
Power Consumption (Max.)	WS5600D: 120 W WS5400R: 100 W WS5400D: 86 W WS5200D: 47 W
Operating Environment	Temperature: 5–35°C; 41–95°F Environment Humidity: 20–80% (no condensation)
Compatibility	Windows PCs, Macs, and tablets with wired or wireless Ethernet connection. <b>Note:</b> The TeraStation requires a network connection with your computer for operation. The TeraStation cannot connect via USB.
Supported OS	Windows 8.1*, Windows 8*, Windows 7*, Windows Vista*, Windows XP, Windows XP Media Center Edition (2004 or 2005), Windows 2000, Windows Server 2012, Windows Server 2008 R2, Windows Server 2008, Windows Server 2003 R2, Windows Server 2003, Windows 2000 Server, Windows RT 8.1, Windows RT OS X 10.8, 10.7, 10.6, 10.5, 10.4, 10.3.9 *32-bit and 64-bit

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## Data Backup

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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.

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## Troubleshooting

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### If you can't access your TeraStation:

Typical problems and when you are unable to search using NAS Navigator2 and when 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 LAN adapter connected to the TeraStation.

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

Try changing the hub port or Ethernet cable that you use 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 LAN board or hub transmission mode has not been set:**

Change the transmission mode in the LAN board or hub to "10M semi-duplex" or "100M semi-duplex". Some LAN boards or hubs may be unable to connect to the network correctly when the transmission 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 Client for Mac" is not installed on your Mac:**

If using OS X 10.4 or later, download and install "Remote Desktop Connection Client for Mac 2" from <http://www.microsoft.com>. If using OS X 10.3.9, use version 1.0.3 instead.

## When TeraStation shared folders suddenly do not open

If the TeraStation shared folder is assigned and used as a network drive, access to the TeraStation may suddenly fail if network settings such as IP addresses or groups are changed. If this happens, follow the procedure in chapter 2 to open the TeraStation's shared folder with NAS Navigator2.

## If you are unable to access the shared folder or the system is unstable

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

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# Windows Storage Server Recovery Procedure

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If Windows Storage Server no longer functions properly, perform recovery using the supplied USB device.

This recovery procedure erases your data. Backing up regularly is highly recommended to avoid missing your important data.

Do not connect the supplied USB device to another TeraStation. The recovery process performed by the supplied USB device is intended for this product only.

Recovery is performed by deleting the area for drive 1, setting up a new 100 GB (Basic Disk/Simple) area, and then copying the Windows Storage Server image to this area.

**Note:** If there are system areas (or mirrored locations) on hard drives other than drive 1, be sure to delete the system areas (or disable the mirrored locations) before performing the recovery procedure. If recovery is performed without deleting these areas, Windows Storage Server may not run after recovery is performed.

If Windows Storage Server fails to run, turn off the TeraStation and perform the recovery procedure again while all hard drives except for drive 1 (disk 0) are disconnected. After recovery is complete, reconnect the disconnected drives, which will appear in "Disk Management" as "Foreign". In "Disk Management", right-click *Foreign*, select *Import Foreign Disks*, then right-click this area and click *Reactivate Volume* to rebuild the RAID array.

**1** Turn off the TeraStation, following the procedure in "Turning the TeraStation On and Off" in chapter 1.

**2** Connect the supplied USB device to the USB 2.0 port.

If the label on the supplied recovery USB device shows version 2.4 or later, you could use the USB 3.0 port for recovery.

- 3** Set the boot mode switch to "USB", then press the power button.  
This executes the recovery process.
- 4** The TeraStation shuts down automatically when the recovery process is complete.
- 5** Remove the USB device, set the boot mode switch to "HDD", and press the power button.  
When the initial setup is complete, the TeraStation will reboot into Windows Storage Server.

**After the recover process is completed, the TeraStation is set to the state below when used at the default settings.**

- Drive 1  
100 MB (EFI System partition)  
100 GB (Basic Disk/Simple)  
The remaining space is an unallocated area.

- Drives 2 to 4  
The data on the drives cannot be viewed. They appear as a "Foreign" in "Disk Management".

**Note:** The data on the drives can be viewed by right-clicking the area displayed as "Foreign" in "Disk Management" and then selecting *Import Foreign Disks*.

- (1) Mirror the system area by using RAID Builder (drive 1 to drive 2).
- (2) Remove the area for RAID 5 in drive 3 and 4.
- (3) Create a RAID 5 volume with drives 1–4 using RAID Builder.

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## Notes

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### Using an Omron UPS

The TeraStation's LCD panel will not display information correctly when an Omron UPS is first connected. This is because the LCD panel control and the Omron UPS both use COM port 2. To resolve, refer to the Omron's user manual and change its UPS communication port to a port other than COM 2, then restart the TeraStation.

### Ethernet port number is not correct on the Windows Storage Server

Ethernet port numbers on the Windows Storage Server are assigned in the order of recognizing them. They might be different from printed port numbers.

# Chapter 10 Regulatory Compliance Information

## For Customers in the United States

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### FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Only use the cables and accessories that are included in the package. Don't use other accessories or cables unless specifically instructed to in the documentation.

## For Customers in Europe

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### EU Declaration of Conformity

Dansk

Dette er et Klasse A-produkt. I et hjemmemiljø kan dette produkt skabe radiointerferens, hvormed det kan være nødvendigt for brugeren at tage passende forholdsregler.

Der må kun bruges de kabler og det tilbehør der er inkluderet i pakken. Der må ikke bruges andet tilbehør eller kabler, medmindre det er udtrykkeligt beskrevet i dokumentationen.

Deutsch

Dies ist ein Produkt der Klasse A. In einer häuslichen Umgebung kann dieses Produkt Funkstörungen verursachen. Um diese zu beheben, müssen ggf. entsprechende Maßnahmen ergriffen werden.

Verwenden Sie ausschließlich die Kabel und Zubehörteile, die im Lieferumfang enthalten sind. Andere Zubehörteile oder Kabel dürfen nur dann verwendet werden, wenn dies in der Dokumentation ausdrücklich vorgeschrieben ist.

English

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

Only use the cables and accessories that are included in the package. Don't use other accessories or cables unless specifically instructed to in the documentation.

#### Español

Este es un producto de Clase A. En una situación doméstica, este producto puede producir interferencias de radio, en ese caso el usuario deberá tomar las medidas adecuadas.

Utilice únicamente los cables y accesorios incluidos en el paquete. No utilice otros accesorios ni cables a menos que así se indique en la documentación.

#### Français

Cet appareil est un produit de Classe A. Dans un environnement domestique, ce produit est susceptible de provoquer des interférences radio, auquel cas l'utilisateur peut être mis en demeure de prendre des mesures appropriées.

Utilisez uniquement les câbles et accessoires inclus dans ce package. N'utilisez aucun autre accessoire ou câble sauf instruction spécifique de la documentation.

#### Italiano

Questo è un prodotto di Classe A. In ambienti domestici il prodotto può causare radiointerferenza, nel qual caso potrebbe rendersi necessaria l'adozione di opportune misure.

Utilizzare esclusivamente i cavi e gli accessori inclusi nell'imballaggio. Non utilizzare altri accessori o cavi a meno che non sia specificamente indicato nella documentazione.

#### Nederlands

Dit is een Klasse A product. Dit product kan in een huishoudelijke omgeving radiostoring veroorzaken in welk geval de gebruiker adequate maatregelen dient te nemen.

Gebruik alleen de kabels en toebehoren die zich in de verpakking bevinden. Gebruik geen ander toebehoren of kabels tenzij dit uitdrukkelijk in de handleiding wordt aangegeven.

#### Norsk

Dette er et produkt i klasse A. I et hjemmemiljø kan dette produktet forårsake radiointerferens, noe som gjør at brukeren i så fall må foreta passende tiltak.

Bruk kun kabler og tilbehør som er inkludert i pakken. Ikke bruk annet tilbehør eller kabler med mindre spesielt instruert til å gjøre det i dokumentasjonen.

#### Português

Este é um produto de Classe A. Num ambiente doméstico, este produto pode provocar interferências de rádio, pelo que o utilizador poderá ter de tomar medidas adequadas.

Utilizar apenas cabos e acessórios incluídos na embalagem. Não utilizar outros acessórios ou cabos, salvo se especificamente indicado na documentação.

#### Suomi

Tämä on luokan A tuote. Tämä tuote voi aiheuttaa radiohäiriöitä kotikäytössä, jolloin käyttäjän on ehkä ryhdyttävä tarvittaviin toimenpiteisiin.

Käytä ainoastaan pakkauksen mukana toimitettuja kaapeleita ja varusteita. Älä käytä muita varusteita tai kaapeleita ellei näin ole erityisesti ohjeistettu asiakirjoissa.

Svensk

Detta är en Klass A-produkt. I en hushållsmiljö kan denna produkt orsaka radiostörningar, och användaren kan i så fall begäras att vidta lämpliga åtgärder.

Använd bara kablar och tillbehör som ingår i förpackningen. Använd inte andra tillbehör eller kablar om du inte får uttryckliga instruktioner om det i dokumentationen.

Türk

Bu, A Sınıfı bir üründür. Evde kullanım sırasında bu ürün radyo girişimine yol açabilir ve bu durumda kullanıcının gerekli önlemleri alması gerekebilir.

Yalnızca pakette bulunan kablo ve aksesuarları kullanın. Belgelerde özellikle belirtilmedikçe başka aksesuar ve kablolar kullanmayın.

## 한국 고객 대상

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KC

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

## 提供給台灣的客戶

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BSMI

警告使用者：

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

## 面向中国用户

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CCC

警告

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

设备的最高使用室内环境温度: 35° C



仅适用于海拔 2000M 以下地区安全使用。

断开装置为电源软线上的插头。插座应当装在设备的附近，而且应当便于触及到。电池警告语

1. 电池不得暴露。
2. 使用型号不正确的电池可能导致爆炸。