

Automation Playback

Playback Data Collection System for Buffalo NAS

Environment Construction Procedures



NOTE

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Introduction

This environment construction procedure (hereinafter referred to as "this document") describes the procedure for building a system for collecting playback data on Synology's DiskStation DS220+.

Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of introducing FA systems.
- Personnel in charge of designing FA systems.
- Personnel in charge of installing and maintaining FA systems.
- Personnel in charge of managing FA systems and facilities.

For programming, this manual is intended for personnel who understand the programming language specifications in international standard IEC 61131-3 or Japanese standard JIS B 3503.

About This Document

This documents covers the following.

- Setting method for outputting data of NW cameras to a NAS for data collection or NAS for NW cameras
- Setting method for sending backup files and variable logs from Omron Machine Automation Controller NX502-1□00 (NX5) to a NAS for data collection
- Configuration procedures for collecting backup files and variable logs output from the NX5 to NAS for data collection and camera data stored in the NAS for NW cameras

This documents does not cover the following in this system.

- Initial user settings for NAS for data collection and NAS for NW cameras
- Installation of Python (Version 3.8.12) onto a NAS for data collection
- Initial NW camera settings
- Settings for sending camera data output trigger from the NX5 to NW cameras

Manual Structure

Special Information

Special information in this manual is classified as follows:



Precautions for Safe Use

Precautions on what to do and what not to do to ensure safe usage of the product.



Precautions for Correct Use

Precautions on what to do and what not to do to ensure proper operation and performance.



Additional Information

Additional information to read as required.

This information is provided to increase understanding or make operation easier.



Version Information

Information on differences in specifications and functionality for Controller with different unit versions and for different versions of the Sysmac Studio is given.

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Related Documents

The following are the documents related to this document. Use these documents for reference.

Cat. No.	Document name
W639	NX-series CPU Unit Automation Playback User's Manual
W641	Automation Playback Camera Control Sample Programs Instructions

Revision History

A document revision code appears as a suffix to the catalog number on the front and back covers of the document.

Revision code	Date	Revised content
01	July 2023	Original production
02	April 2025	Added information about Axis camera versions

System Configuration

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1-1 Equipment Used

This document explains the system configuration that uses the following equipment and devices.

Block	Used equipment and device
NAS for data collection	BuffaloTeraStation WS5020
NAS for NW cameras	(FW version 3.70)
NW camera	Axis Communications AXIS M5525-E
NX5	Omron Machine Automation Controller NX502- 1□00
Network device	Ethernet switch supporting PoE
WinPC	Windows 10 OS computer (any device name)

1-2 Basic System Configuration

The basic configuration of this system consists of an NX5 and an NW camera connected to a NAS on one network.

A NAS for NW cameras (dedicated NAS for NW cameras) can also be added to the configuration to store camera data output from NW cameras.

In addition, the number of NX5, NW cameras and dedicated NAS for NW cameras can be increased for your purpose.

Since this system handles large capacity data, we recommend that you develop the system with the following performance.

- Ethernet line speed: 1 Gbps
- Write performance to NAS where NW cameras store data: 100 to 200 MB/s

1-3 Communication Specifications Between Blocks

The communication method between each block and data meaning are as follows.

Between blocks	Communication method	Communication data
NAS for data collection ↔ NX5	FTP Create an FTP site on the NAS for data collection and transfer files to the NAS from NX5	Backup file Variable log
NAS for data collection ↔ NW camera	SMB Create an SMB shared directory on the NAS for data collection and allow the NW camera to output files	Camera data
NAS for NW cameras ↔ NW camera	SMB Create an SMB shared directory on the NAS for NW cameras and allow the NW camera to output files	
NAS for data collection ↔ NAS for NW cameras	SMB Create an SMB shared directory on the NAS for NW cameras and allow the NAS for data collection to collect files	
NX5 ↔ NW camera	Sends a camera data output trigger from NX5 to NW cameras	Trigger

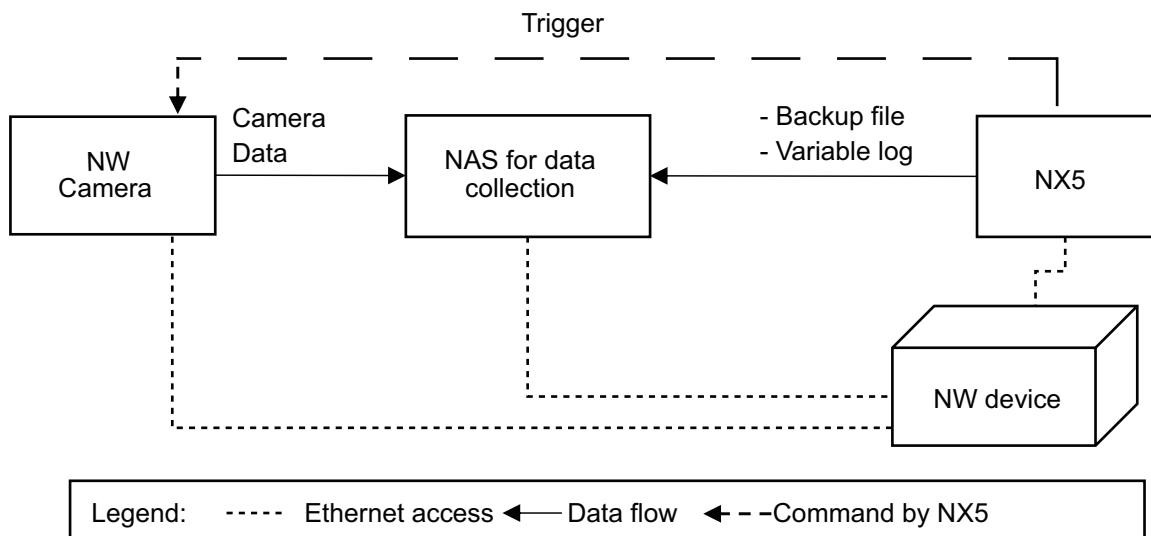
1-4 Sample System Configuration

The following are examples of system configuration.

1-4-1 Example of a System that Collect Playback Data on a NAS

The figure below illustrates a configuration in which an NX5, a NAS, and an NW camera are connected on one network.

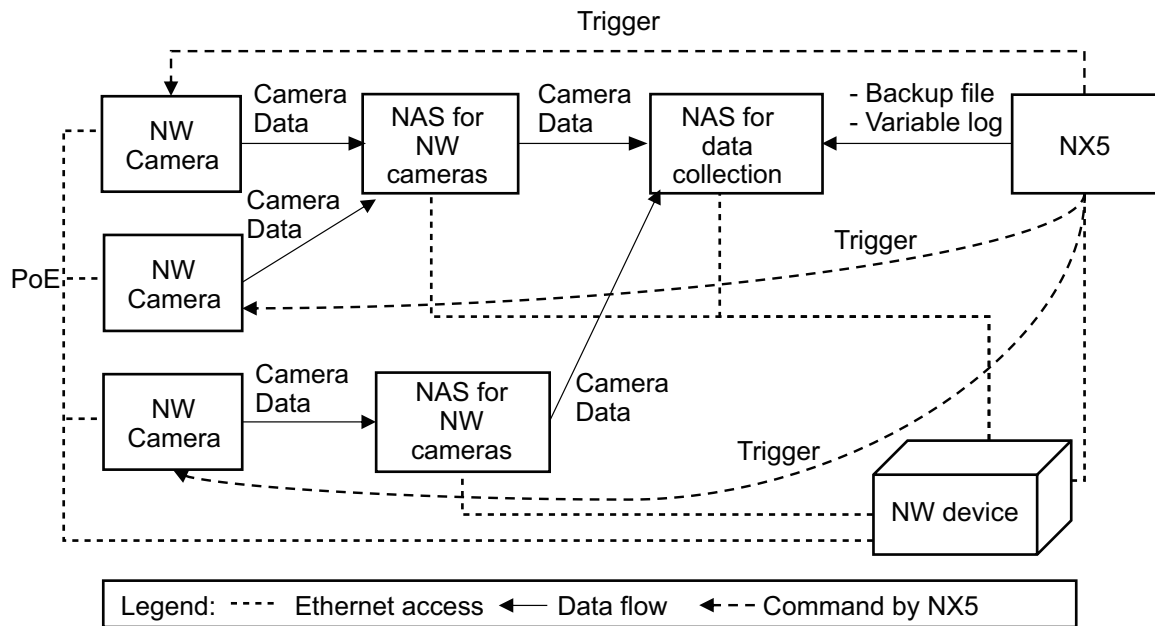
The NAS for data collection retrieves backup files and variable logs that the NX5 outputs to the NAS for data collection and camera data that the NW camera outputs to the NAS for data collection.



1-4-2 Example of a System That Collects Playback Data Using Multiple NAS for NW Cameras

The figure below illustrates a configuration in which an NX5, a NAS for data collection, two NAS for NW cameras, and three NW cameras are connected on one network.

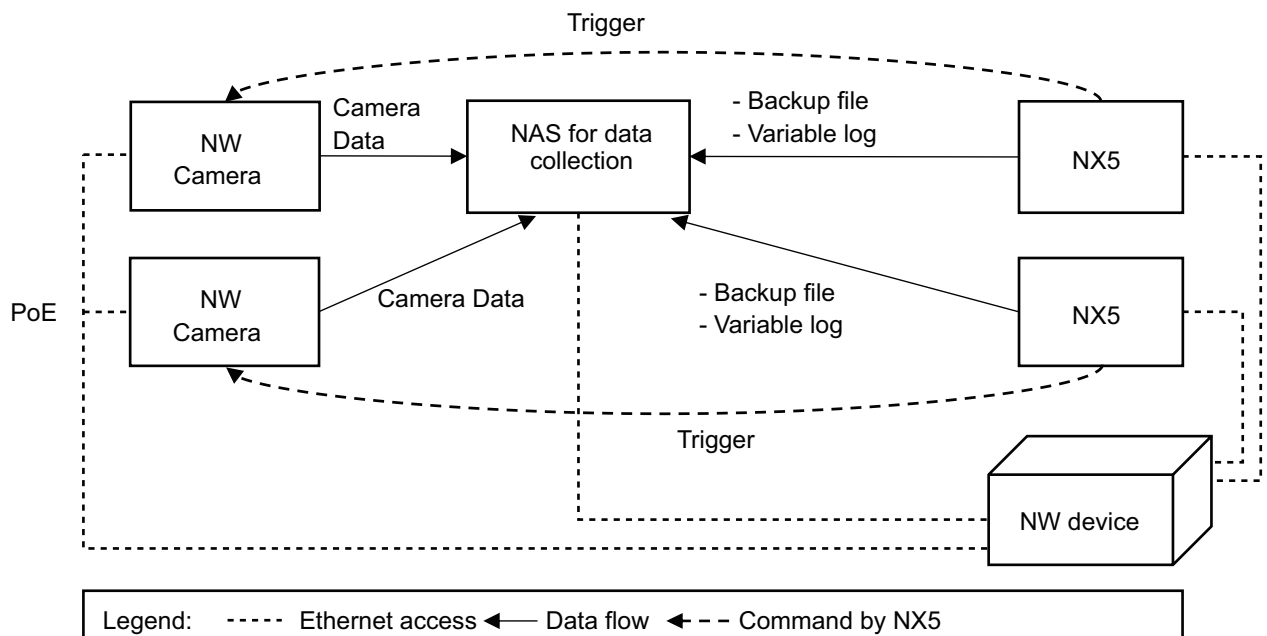
The NAS for data collection retrieves backup files and variable logs that the NX5 outputs to the NAS for data collection, as well as the camera data accumulated on multiple NAS for NW cameras.



1-4-3 Example of a System That Collects Playback Data from Multiple NX5

The figure below illustrates a configuration in which a NAS for data consolidation, two NX5 and two NW cameras are connected on one network.

The NAS for data collection retrieves backup files and variable logs that each NX5 outputs to the NAS for data collection and camera data that the NW cameras output to the NAS for data collection.



1-5 Cameras That Have Been Tested for Proper Operation

Omron has tested the operation with the following cameras. However, Omron does not guarantee the operation of those cameras.

Model	OS version	Type	Maximum resolution	Maximum fps
AXIS M3085-V	11.4.63	Dome	1920 × 1080	25/30
AXIS M3086-V	11.4.63		2688 × 1512	25/30
AXIS M3115-LVE	10.12.166		1920 × 1080	25/30
AXIS M5075-G	11.4.63	PTZ	1920 × 1080	50/60
AXIS M5525-E	8.40.19		1920 × 1080	25/30
AXIS P1245	9.80.28	Modular	1920 × 1080	25/30
AXIS P1275	9.80.28		1920 × 1080	25/30
AXIS P1375	10.12.166	Box	1920 × 1080	50/60
	11.4.63			

2

Building System Environment

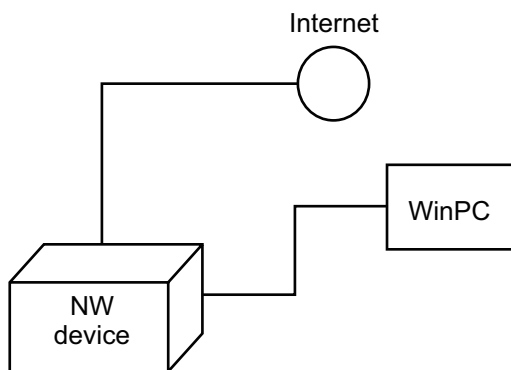
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2-1 Setting up Computer for Building System Environment

Since the TeraStation WS5020 does not have any interfaces such as a display or keyboard, any configuration changes must be made from another computer on the same network.

In this document, we use a Windows 10 computer (hereinafter referred to as WinPC) for building the environment, and configure the settings using a dedicated NAS setting software.

Follow the steps below in an environment where a WinPC is connected to the network devices via the Internet.

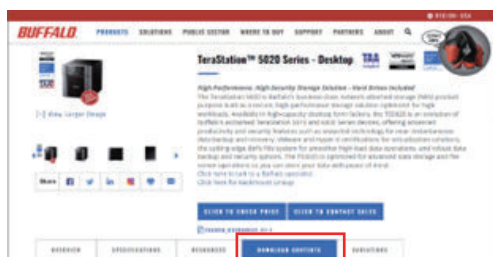


2-1-1 Installing NAS Configuration Software

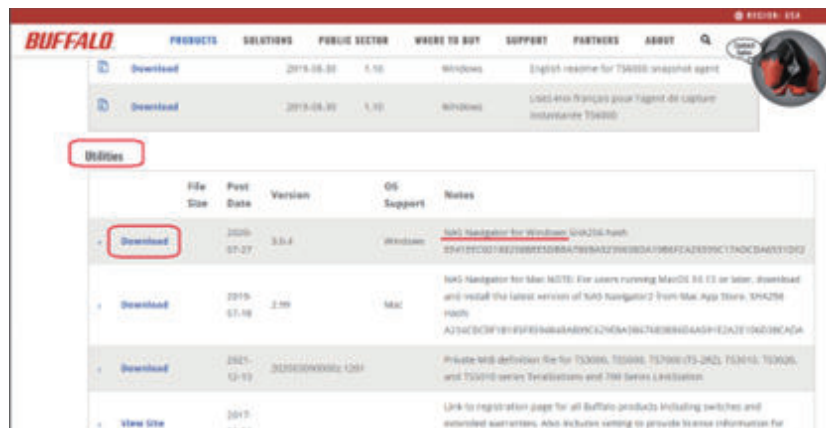
1 Downloading the Installer

- 1) Visit the download site by clicking URL below.

<https://www.buffalotech.com/products/terastation-5020-series-desktop>

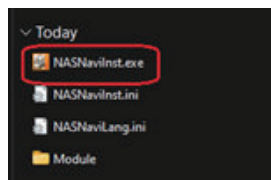


- 2) Select the **I agree to the license** check box at the bottom of the website and select the **Download** button.

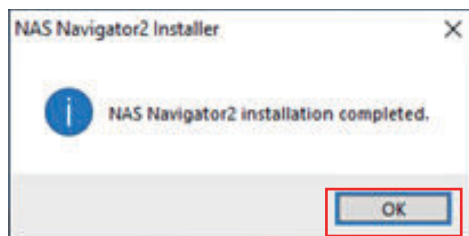


2 Executing the Installer

- 1) Right-click the downloaded installer and select the **Run as administrator** to run the installer.



- 2) When the installation is complete, the following window is displayed.

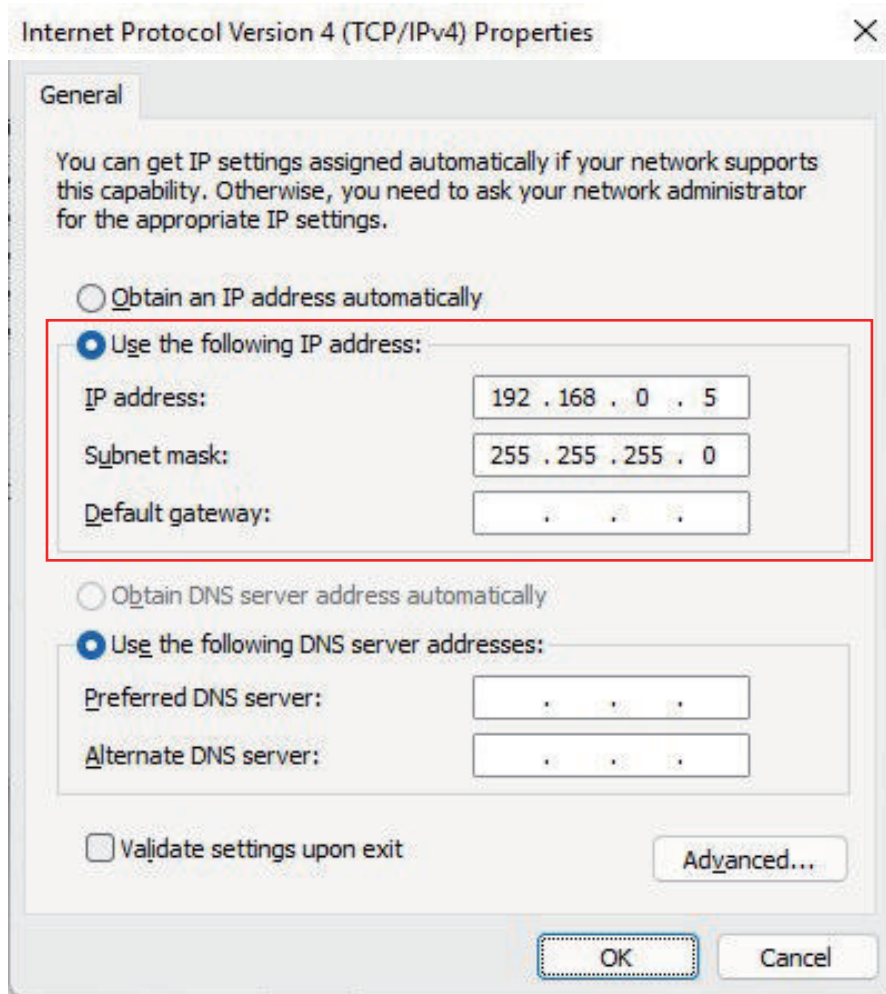


- 3) Select the **OK** button to exit the installer.

2-1-2 Network Settings

To connect the WinPC to the NAS and NW cameras and perform settings, configure the network settings so that they are on the same network.

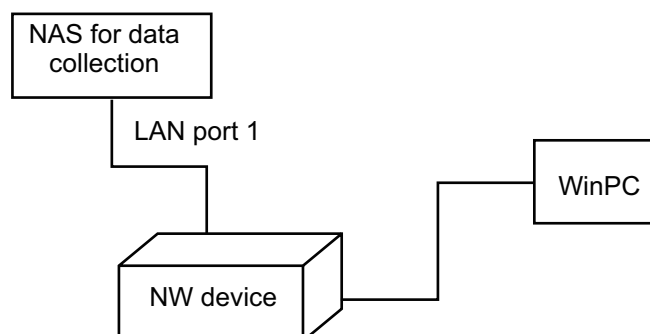
The following figure shows an example of setting the IP address and subnet mask to 192. 168.0.5 and 255.255.255.0, respectively.



2-2 Setting up NAS

Use the NAS setting software on the WinPC to configure the NAS.

First, connect the LAN1 port on the rear side of the NAS to the NW device, and turn ON the power supply of the NAS.



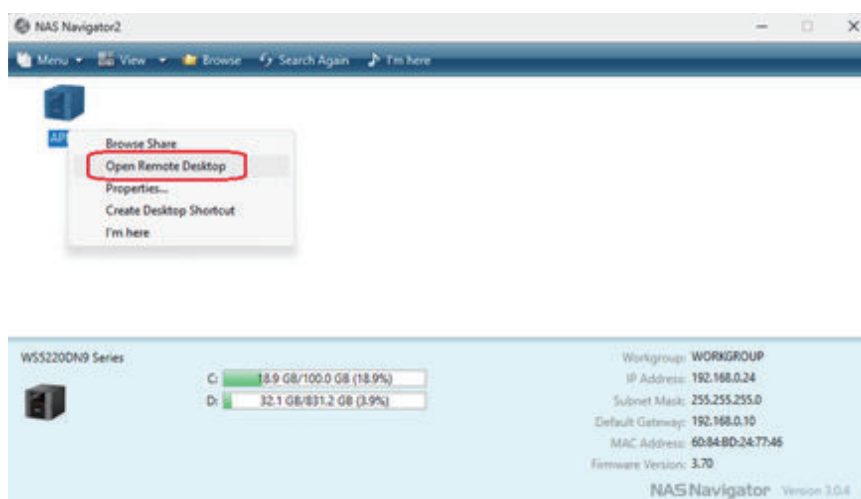
The NAS to be connected must be configured with the user settings and LAN port 1 network settings in advance.

In this document, the procedure uses an example where the NAS is set as follows.

Item	Set value
Server name	APB3
Username	APB
IP address	192.168.0.23
Subnet mask	255.255.255.0

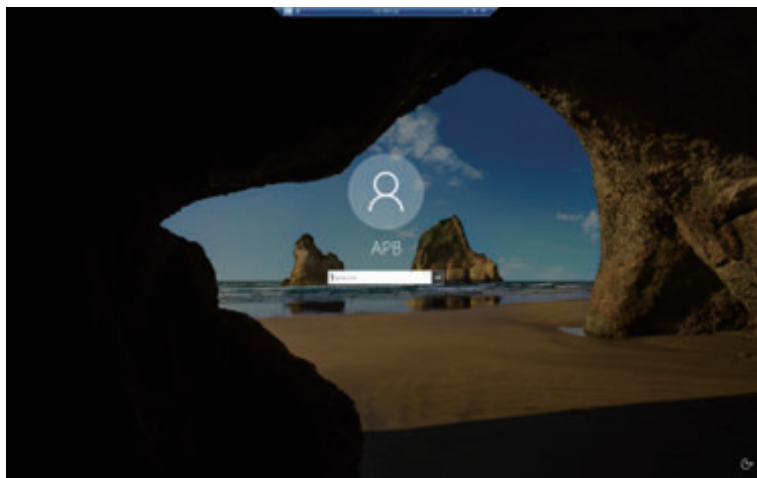
2-2-1 Connecting to NAS

- 1 Run the NAS configuration software (BUFFALO NAS Navigator2).
The window to select the NAS is displayed.
- 2 Right-click the connected NAS and select **Open Remote Desktop**.



The Windows login screen is displayed.

- 3 Select the user name and enter the password to log in.



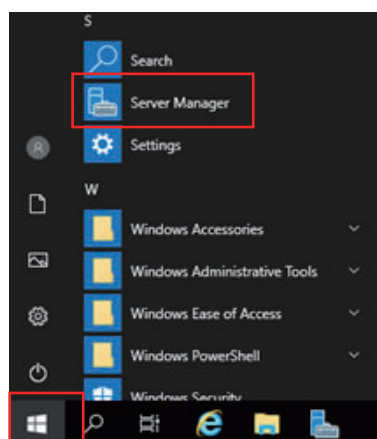
If the login is successful, the NAS (Windows) desktop screen is displayed.



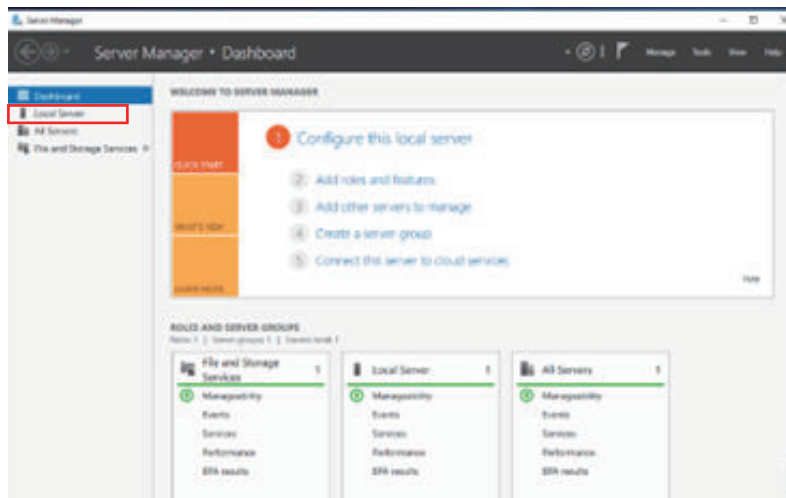
2-2-2 Setting the Time Zone

The time zone of the NAS must be set to the same setting as the NX5. To set the time zone, perform the following steps.

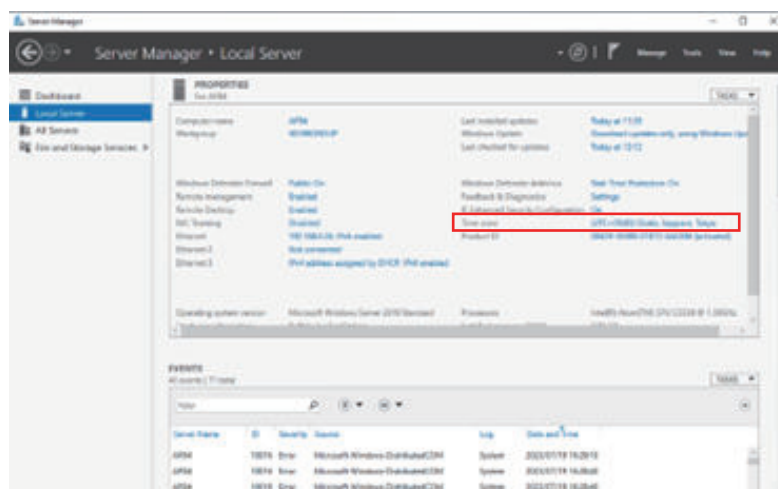
- 1 Select the Start button on the taskbar and run Server Manager.



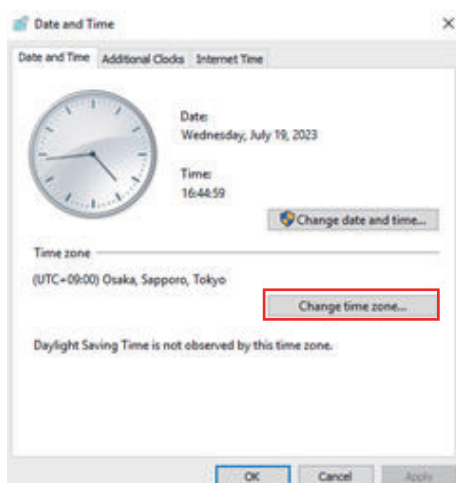
2 Select the **Local Server**.



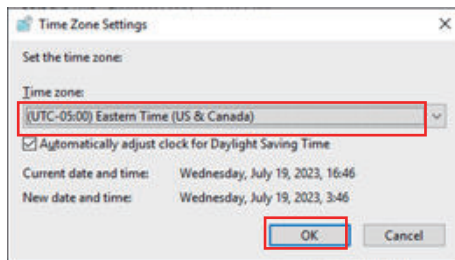
3 Select the blue text to the right of the **Time Zone**.



4 Select the **Change time zone** button.



- 5 Select the same time zone as the NX5 from the pull-down menu, and then click the **OK** button. The following is an example of setting Japan time (UTC +09:00) as the time zone.

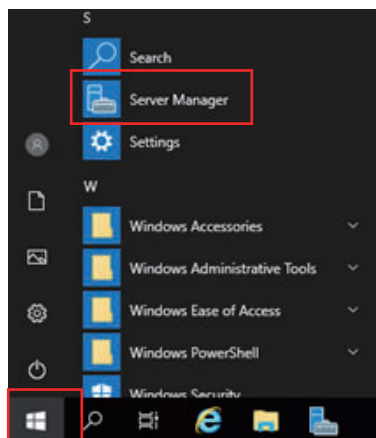


2-2-3 Configuring FTP

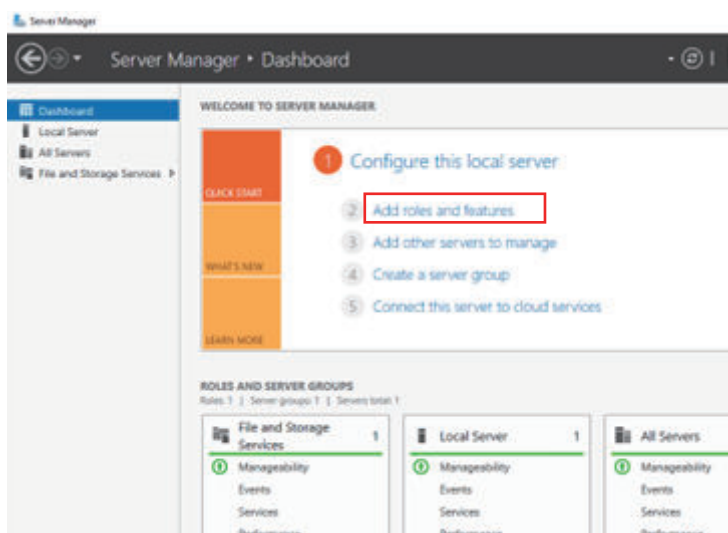
To transfer backup files and variable logs from the NX5 to the NAS for data collection, create a directory (FTP site) for FTP on the NAS for data collection.

1 Enabling FTP

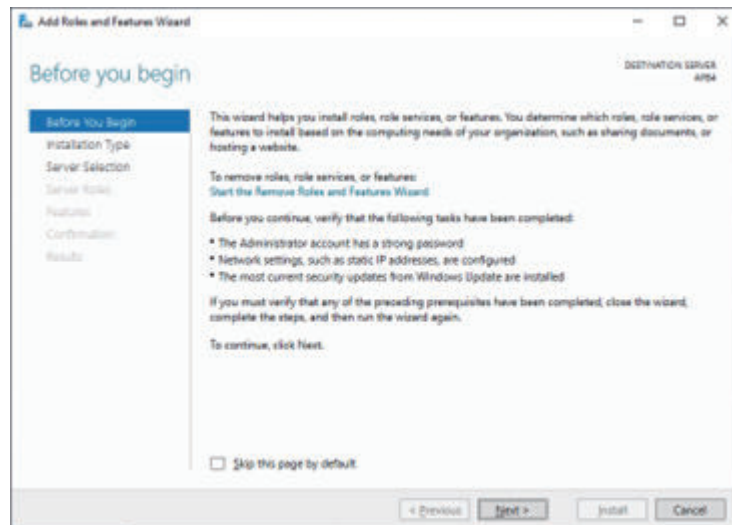
- 1) Select the Start button on the taskbar and run Server Manager.



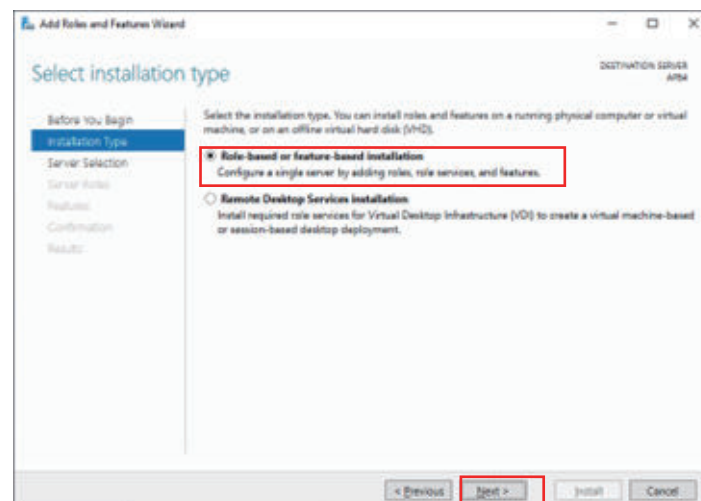
- 2) Select **Add roles and features**.



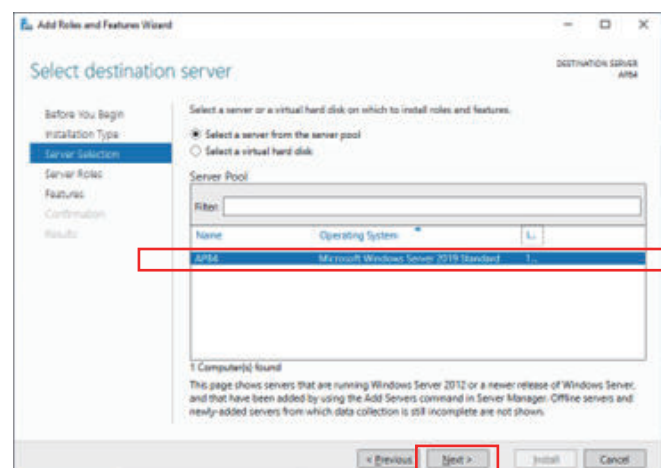
- 3) Select the **Next** button.



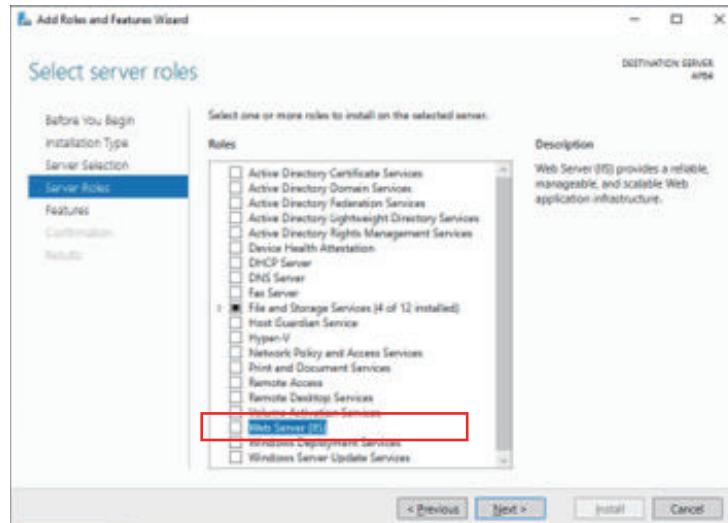
- 4) Select **Role-based or feature-based installation**, and then select the **Next** button.



- 5) From the list of server pools, select the server name, and then click the **Next** button.

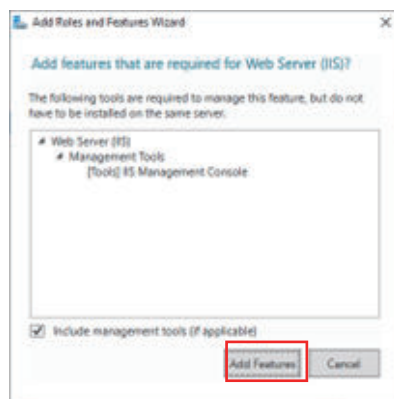


- 6) From the list of roles, select the check box for **Web Server (IIS)**.

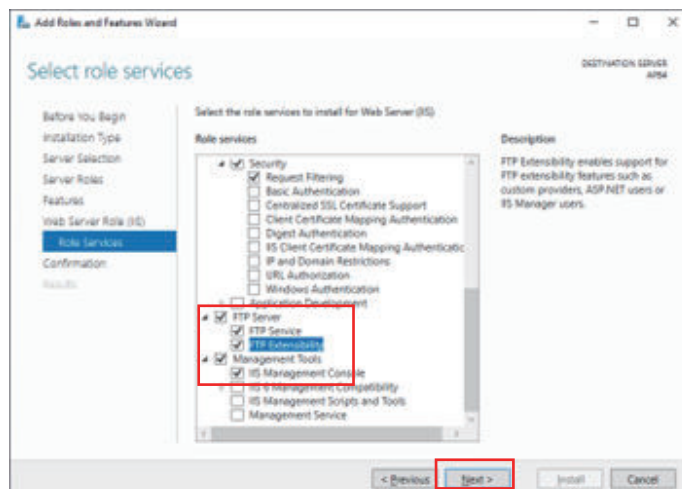


The **Add Roles and Features Wizard** is displayed.

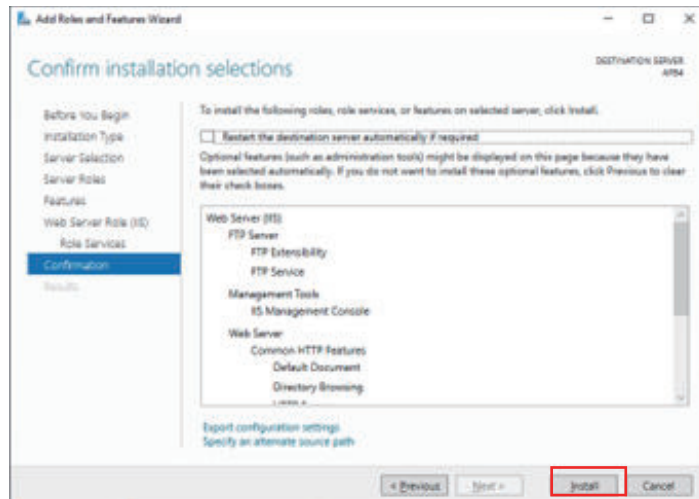
- 7) Select the **Add Features** button.



- 8) Select the check boxes for **FTP Service**, **FTP Extensibility**, and **IIS Management Console**, and then select the **Next** button.



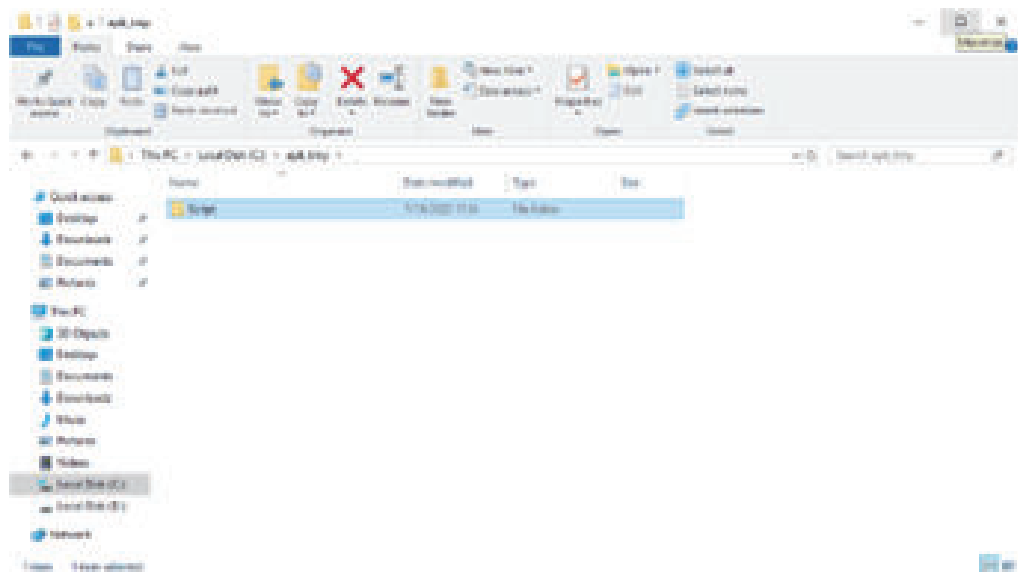
- 9) Select the **Install** button.



2 Creating a Directory to Be Set for FTP Site

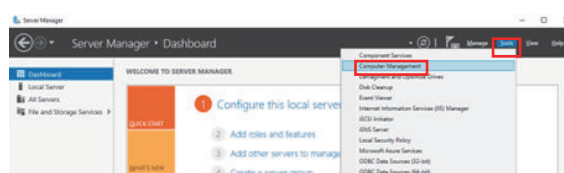
- 1) Open Explorer and create a directory for the FTP site.

The following is an example of creating a directory when the path of an FTP site is C:/apb_tmp/Script.

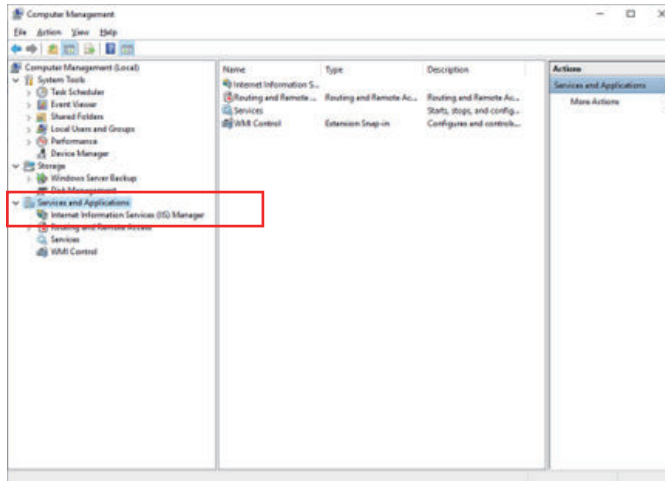


3 Creating an FTP Site

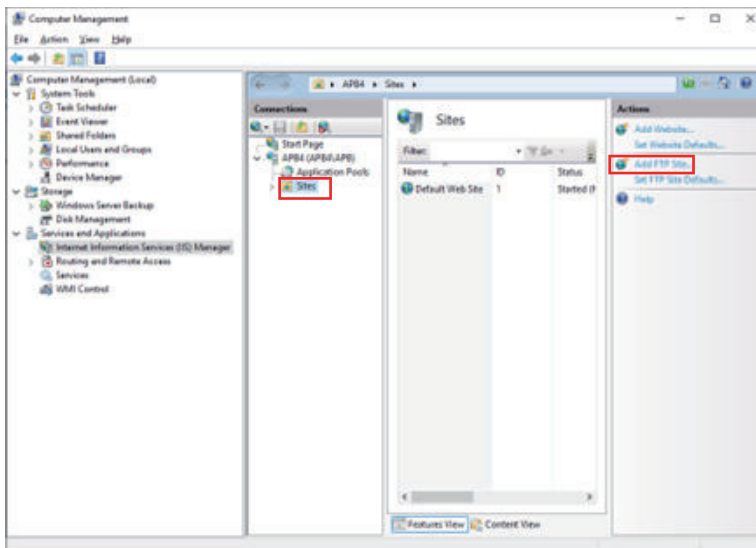
- 1) From the **Server Manager** window, select **Tools** menu, and then **Computer Management**.



- 2) Select **Services and Applications** to expand, and then select **Internet Information Services (IIS) Manager**.



- 3) Select **Sites** and select **Add FTP Site** from the displayed **Actions** tab.



- 4) Enter a name in **FTP site name**, and the absolute path of the directory set as the FTP site in **Physical path** under **Content Directory**, and then select the **Next** button.
- The following is an example of setting "APB" for the FTP site name and "C:/apb_tmp/Script" for the path of the FTP site.

Add FTP Site

Site Information

FTP site name
APB

Content Directory
Physical path
C:\apb_img\Script

Previous Next Finish Cancel



Additional Information

The FTP site whose absolute path was set is used as the base directory where the backup files and variable logs transferred from the NX5 by FTP are stored.

- 5) Enter "21" in the IP address and port of the server being set as the IP address. Select the **No SSL** option, and select the **Next** button.

Add FTP Site

Binding and SSL Settings

Binding
IP address: 192.168.0.24 Port: 21

☐ Enable Virtual Host Names
Virtual Host (example: ftp.example.com)

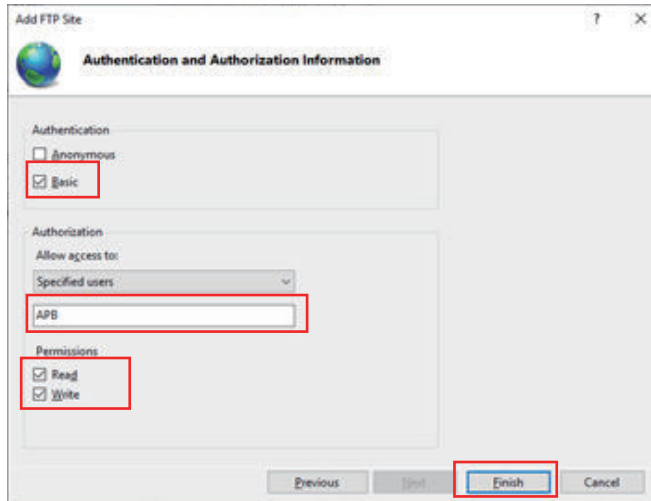
☒ Start FTP site automatically

SSL
☒ No SSL
☐ Allow SSL
☐ Require SSL

SSL Certificate
Not Selected

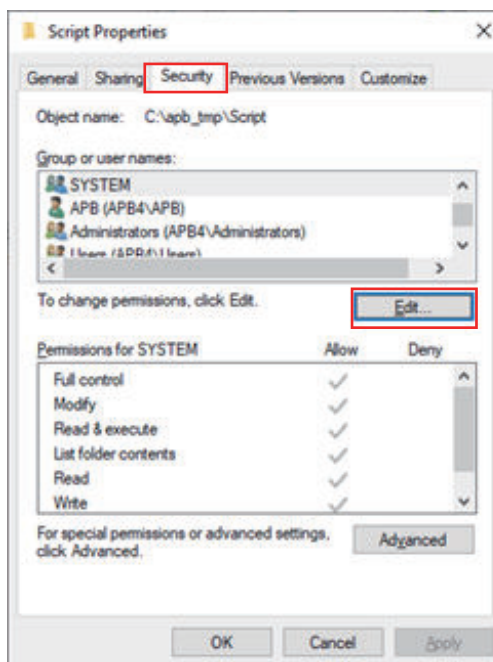
Previous Next Finish Cancel

- 6) Select the **Basic** option for **Authentication**, enter the user name in **Specified users** under **Authentication**, and select both **Read** and **Write** checkboxes for Permissions. Then, select the **Finish** button.

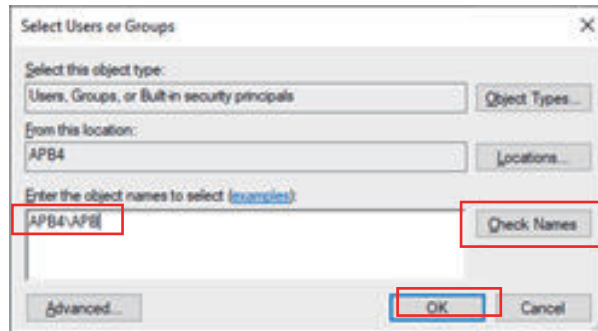


4 Configuring Directory Access Privileges

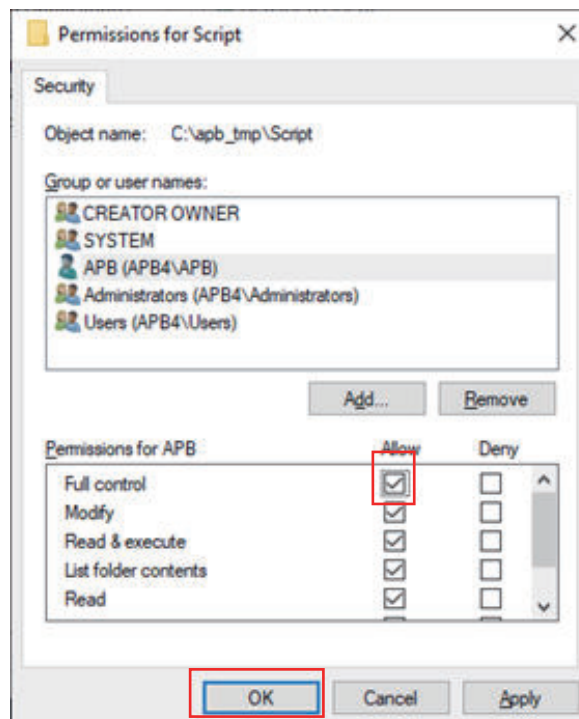
- 1) Right-click to select the directory set as the path of the FTP site and select **Properties**. This section uses C:/apb_tmp/Script as an example.
- 2) Select the **Edit** button on the **Security** tab.



- 3) Enter the user name in the **Enter the object names to select** field and click the **Check Names** button. The user name is changed to the correct format. After confirmation, select the **OK** button.



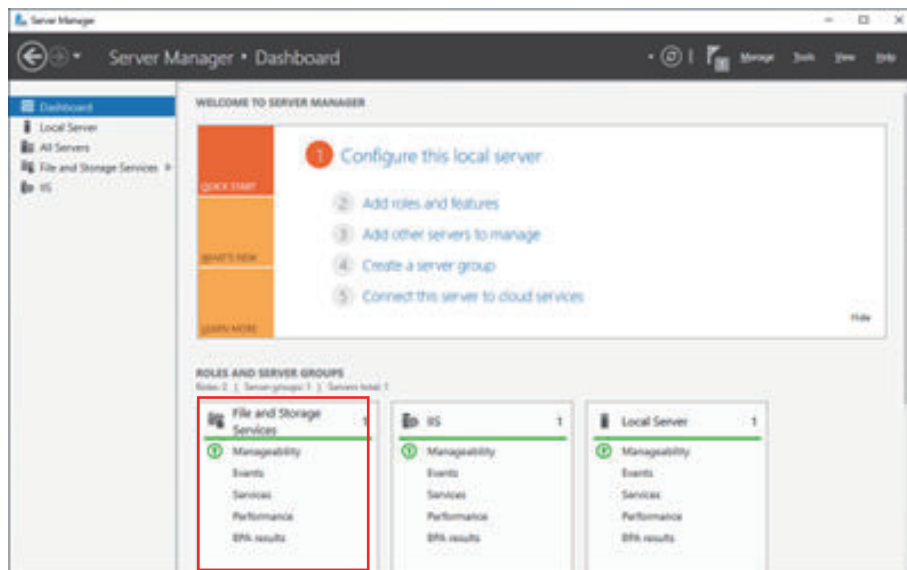
- 4) Select the checkbox for "Full control" in **Permissions for APB**, and then select the **OK** button.



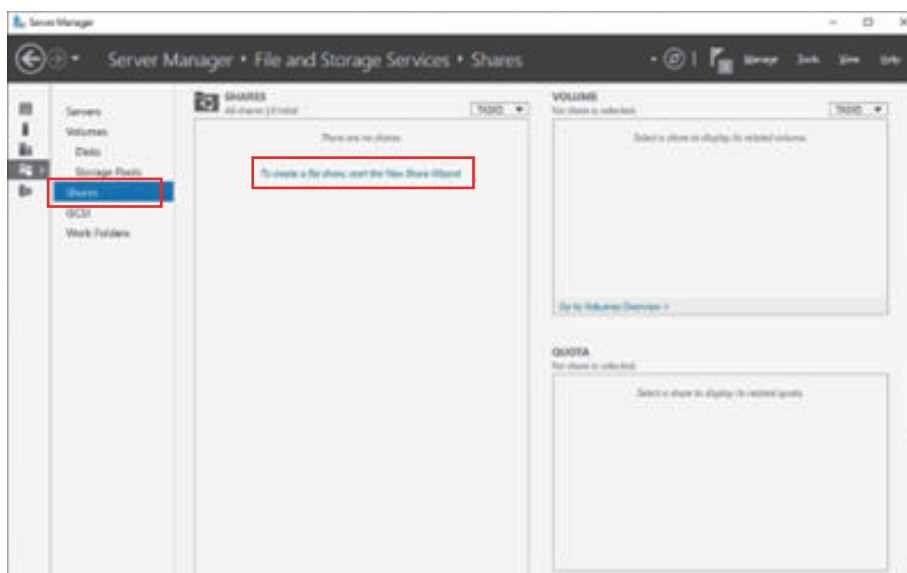
2-2-4 SMB Shared Directory Settings

Create an SMB shared directory on the NAS to enable camera data output from the NW camera to the NAS for data collection or the NAS for NW cameras, and enable camera data in the NAS for data collection output to the NAS for NW cameras.

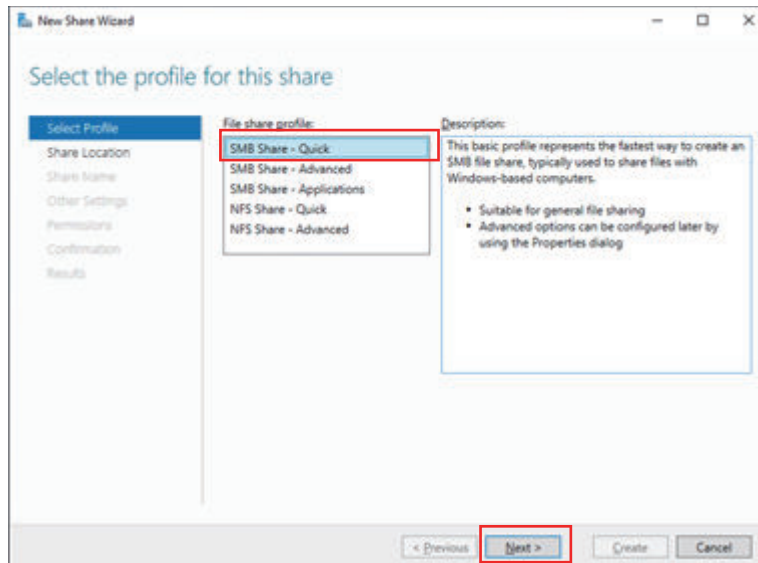
- 1 Open the Server Manager and select **File and Storage Services**.



- 2** Select **Shares**, and then select **To create a file share, start the New Share Wizard**.

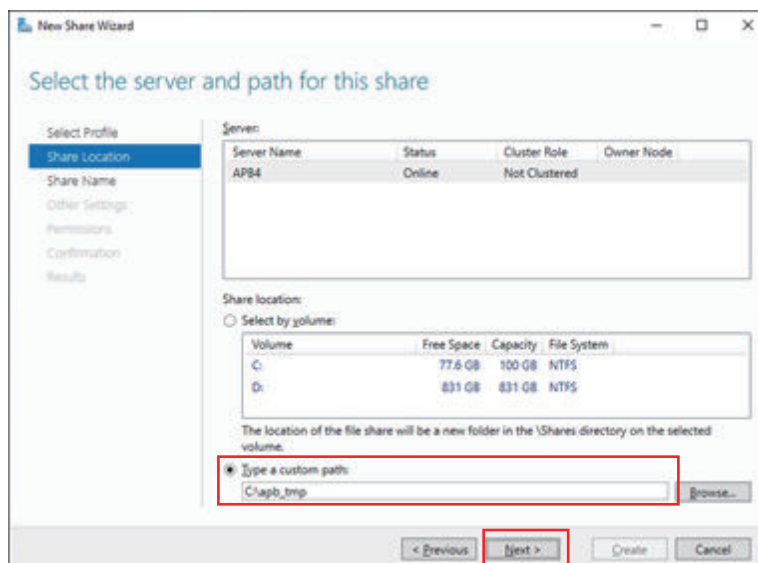


- 3** Select **SMB Share - Quick** and select the **Next** button.



- 4** Select the **Type a custom path** option and enter the path of the directory you want to share via SMB.

The following is an example of setting "C:/apb_tmp" for the path to the SMB shared directory.



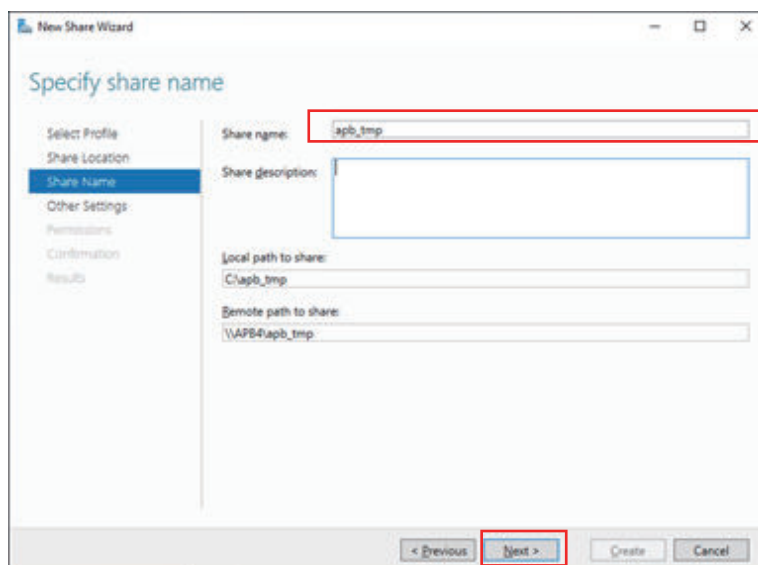
Additional Information

Since C:/apb_tmp was created in the 2-2-3 *Configuring FTP* on page 2-8, the directory creation procedure is not explained here.

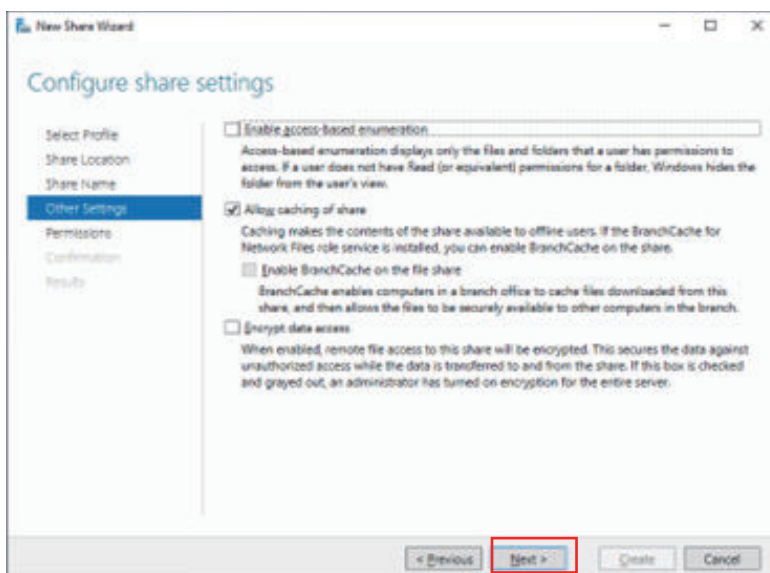
If you need to create a directory, create the directory and then configure it.

- 5** Set the **Share name** to the name you want to specify for external access and select the **Next** button.

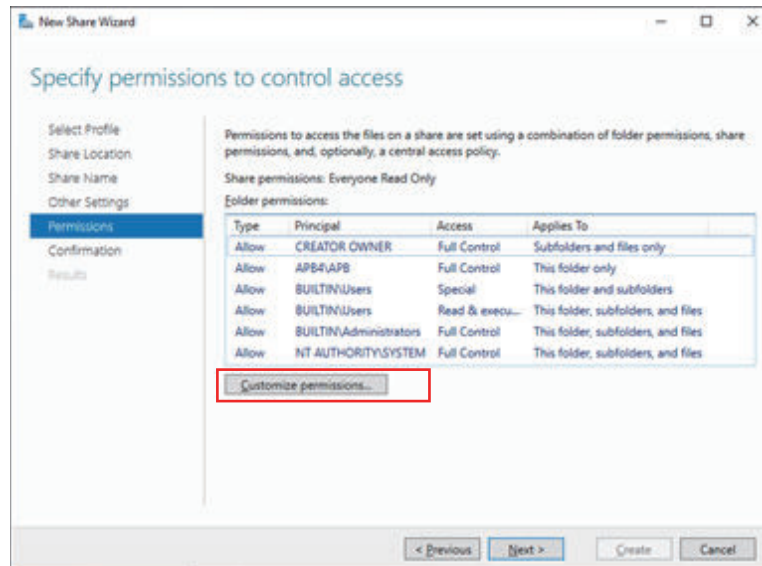
An example of setting "apb_tmp" to the shared directory name is given below.



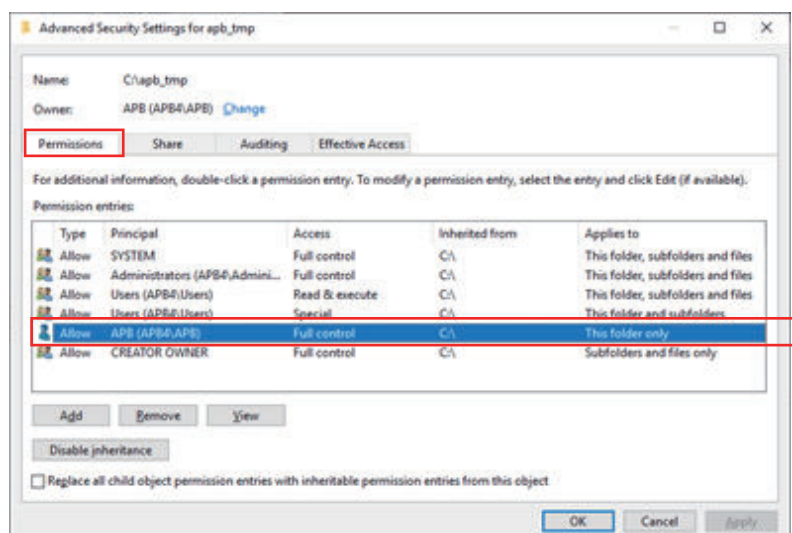
6 Select the **Next** button.



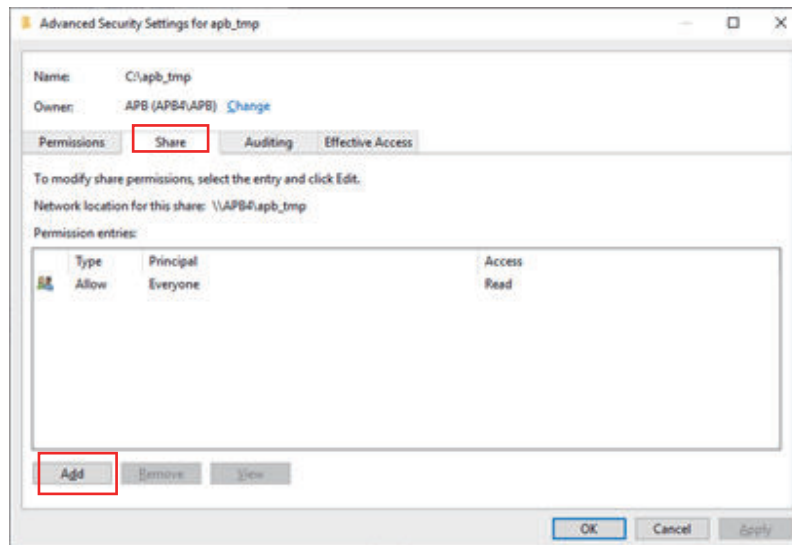
7 Select the **Customize permissions** button.



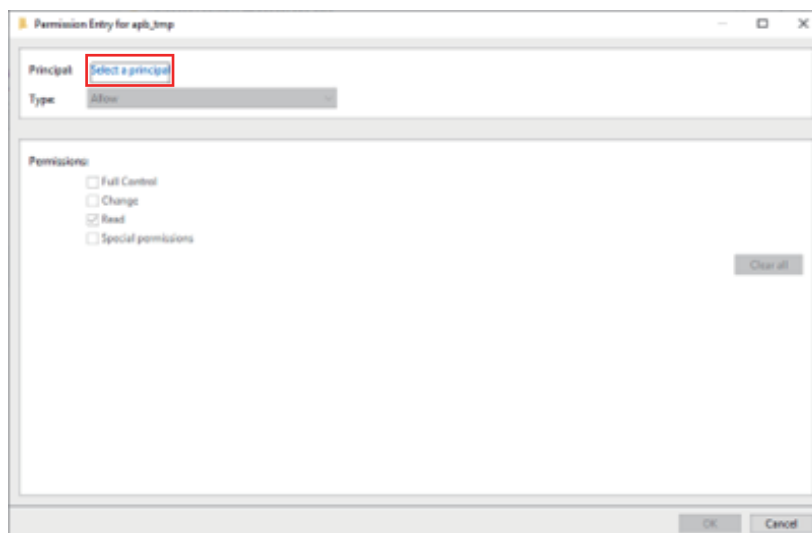
- 8 Verify that the **Permission entries** on the **Permissions** tab has the target user name to be set.



- 9 Select the **Share** tab and select the **Add** button.

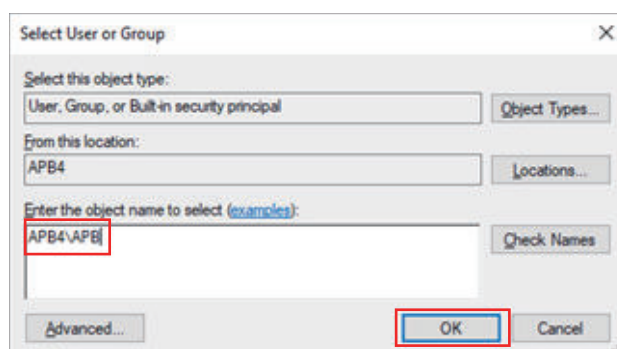


10 Click the **Select a principal** button.

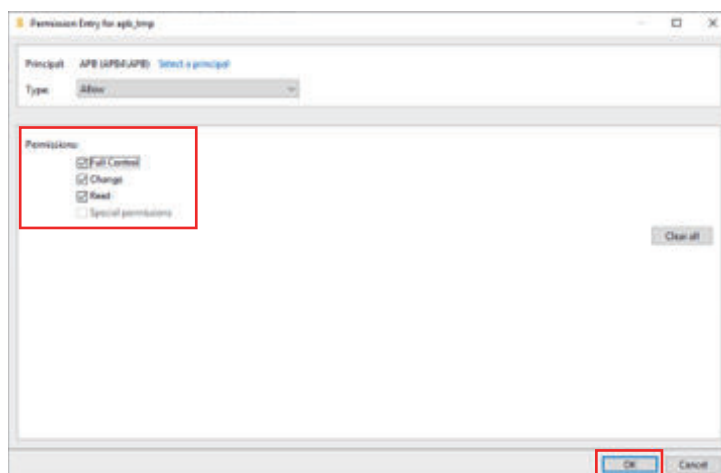


11 Enter the user name in the **Enter object names to select** field and click the **Check Names** button.

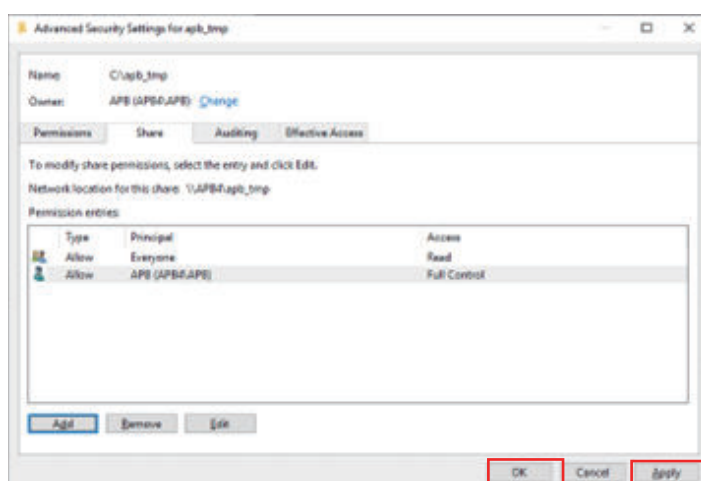
The user name is changed to the correct format. After confirmation, select the **OK** button.



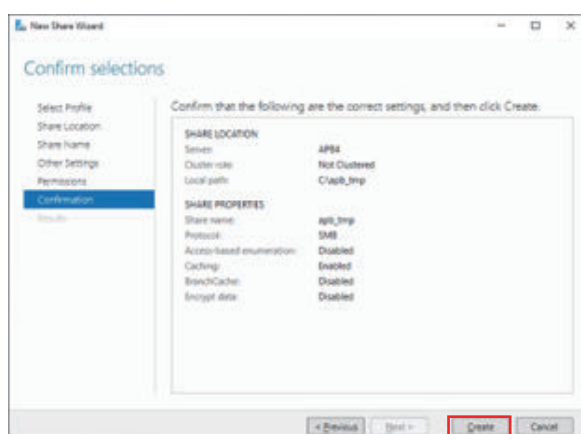
- 12** Check the checkboxes for **Full Control**, **Change**, and **Read** under Permissions, and then select the **OK** button.



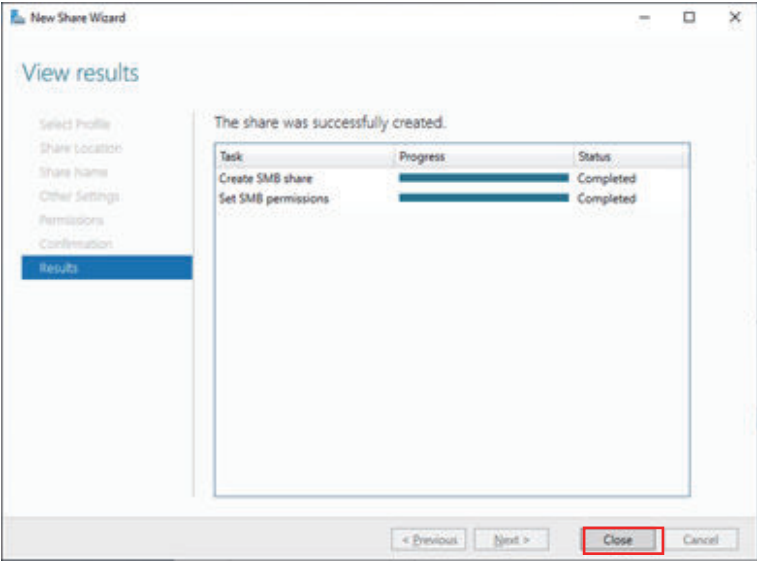
- 13** After selecting the **Apply** button, select the **OK** button.



- 14** Select the **Create** button.



- 15** Confirm that the progress of all tasks is complete and select the **Close** button.

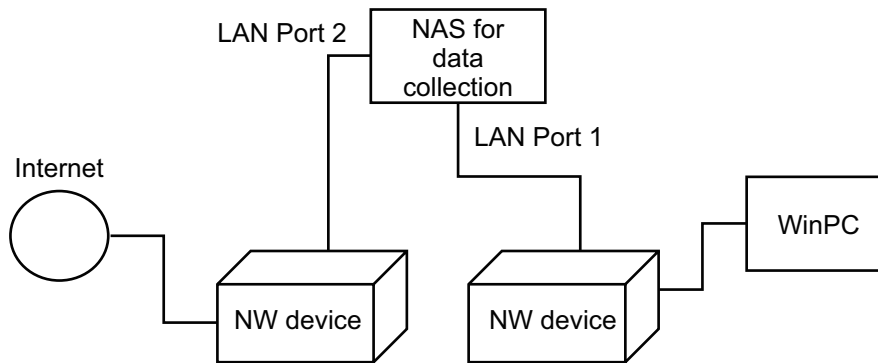


2-2-5 How to Set Dedicated NAS for NW Cameras (Optional)

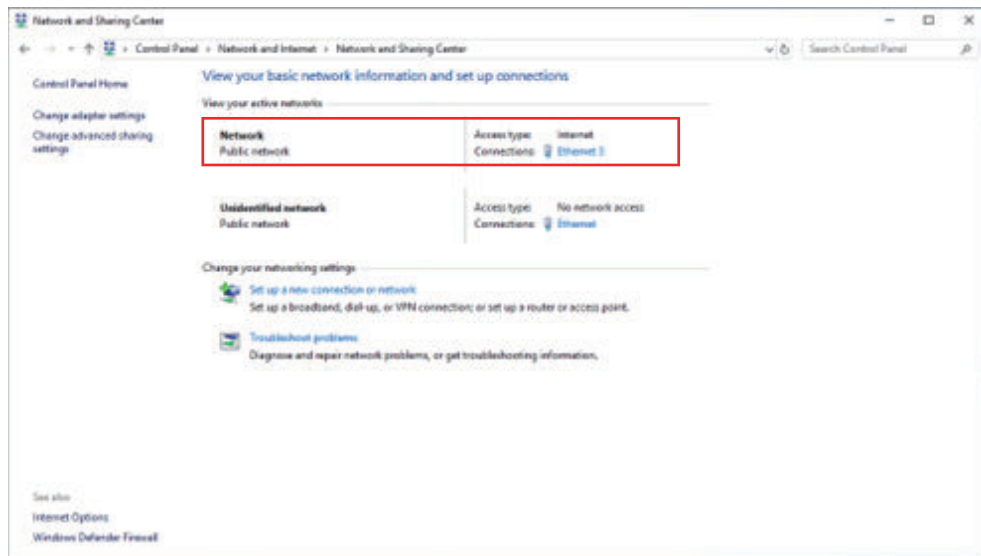
When setting up a NAS for use as a NAS for NW cameras, perform settings from *2-2-1 Connecting to NAS* on page 2-5 to *2-2-4 SMB Shared Directory Settings* on page 2-15 for each NAS for NW cameras.

However, the IP address of the NAS for NW cameras must be set to a value different from that of other NAS and devices.

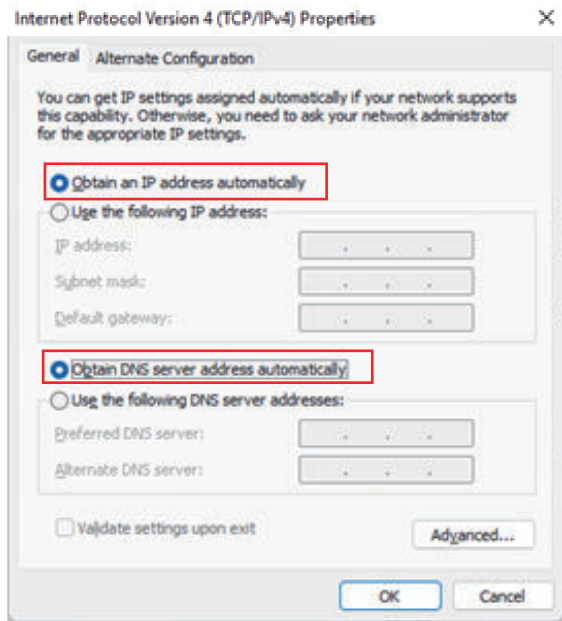
2-3 Building the Script Execution Environment



- 1 After logging in to the NAS for data collection from the NAS configuration software, open the **Control Panel**, select **Network and Internet** and then select **Network and Sharing Center**.
- 2 Select the **Ethernet** for the network that is connected to the Internet.



- 3 Select **Properties – Internet Protocol Version 4 (TCP/IPv4)**, and then **Properties**. Make sure that **Obtain an IP address automatically** and **Obtain DNS server address automatically** are selected.



2-3-1 Installing Python Libraries

After logging in to the NAS for data collection, start the command prompt and enter the following command.

```
pip install pysmb moviepy tzlocal watchdog python-dateutil
```

The installation of the relevant libraries is finished.

Disconnect LAN port 2 on the back side of the NAS for data collection and the network device connected to the Internet.



Additional Information

Python is preinstalled in the NAS for data collection, Buffalo TeraStation WS 5020 (FW-version 3.70), described in this manual.

2-3-2 Setting and Placing the Script

Place the script and script setting file in a directory on the NAS for data collection.

The script setting file is a file that contains various settings required for executing the script. It is imported when the script is executed.

The script setting file must be located in the same directory as the script on the NAS for data collection.

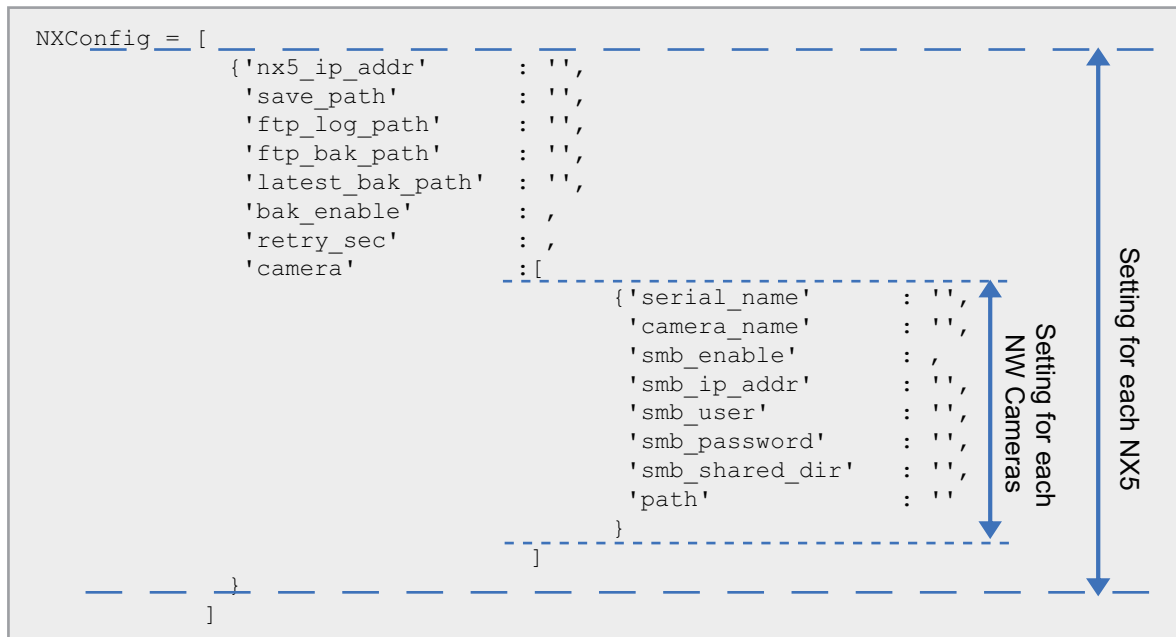
The file names are as follows.

File type	File name
Script setting file	settings.py
Script	pbdata_collection.py

Parameter List of Script Setting File

Configure the script setting file according to your system configuration.

The script settings file consists of parameters set for each NX5 and parameters set for each NW camera.



The following parameters can be set in the script setting file.

Use "/" as a delimiter representing the directory nesting level in each path setting.

Parameter name	Data type	Description
NXConfig	Array of structure	If there are multiple NX5, create as many settings as NX5s by separating the arrays with commas ",".

Parameter name		Data type	Description
nx5_ip_addr		Text string	NX5 IP address name (unused parameter)
save_path [Save destination path]		Text string	Set an absolute path to the directory to which the files are stored.
ftp_log_path [Variable log FTP path]		Text string	Set an absolute path to the directory where variable logs are transferred by FTP from the NX5. This setting must be same as the transfer path settings for the NX5.
ftp_bak_path [Backup file FTP path]		Text string	Set an absolute path for the directory where backup files are transferred from the NX5 by FTP. This setting must be same as the transfer path settings on the NX5.
latest_bak_path [Most recent backup file storage path]		Text string	Set an absolute path to the directory that stores the most recent backup file transferred to ftp_bak_path. Copy the backup file saved here to the Proj directory in the data collection destination directory.
bak_enable		Logic	Set whether to retrieve backup files. Set True to enable, or select False to disable. This setting must be same as the backup file storage settings on the NX5.
retry_sec		Number	Set the wait time for the next retrieval. [seconds] If there is no camera data to be retrieved at the time of data collection, the script checks again if camera data exists after this wait time.
Camera		Array of structure	If there are multiple NW cameras, create as many structures as the NW cameras by separating the arrays with commas “ , ”.
	serial_name	Text string	Set the serial number for the NW camera. Camera data with matching serial numbers is retrieved.
	camera_name [Camera name]	Text string	Set the camera name to identify NW cameras.
	smb_enable	Logic	Set this parameter to True if the camera data retrieved is stored in the NAS for NW cameras and set to False if the camera data is stored in the NAS for data collection.
	smb_user	Text string	Set the username for the NAS for NW cameras. If smb_enable is True, additional parameter items must be added and set.
	smb_password	Text string	Set the password for the NW camera. If smb_enable is True, additional parameter items must be added and set.
	smb_shared_dir	Text string	Set the shared directory name of the NAS for NW cameras. If smb_enable is True, additional parameter items must be added and set.
	path [Camera data path]	Text string	When camera data is stored on the NAS for NW cameras (SMB_enable is True), specify the directory below the SMB shared directory name. If the data is stored directly below the shared SMB directory, leave nothing entered. If the camera data is stored in the NAS for data collection (smb_enable is False), specify the absolute path to the directory.

Example for Parameter Setting

- Setting example for a case where camera data is output to the NAS for data collection

Device	IP address	Directory (SMB)	Directory (FTP)
NW camera (with serial number B8A44F78EB4D)	192.168.250.90	---	---
NAS for data collection	192.168.250.10	C:/apb_tmp	C:/apb_tmp/Script
NX5	192.168.250.30	---	---

```

NXConfig = [
    {
        'nx5_ip_addr'      : '192.168.250.30',
        'save_path'        : 'C:/apb_tmp/Script/save',
        'ftp_log_path'     : 'C:/apb_tmp/Script',
        'ftp_bak_path'     : 'C:/apb_tmp/Script/Proj',
        'latest_bak_path'  : 'C:/apb_tmp/Script/latest',
        'bak_enable'       : True,
        'retry_sec'        : 10,
        'camera'           : [
            {
                'serial_name' : 'B8A44F78EB4D',
                'camera_name'  : 'Cam1',
                'smb_enable'   : False,
                'path'         : 'C:/apb_tmp'
            }
        ]
    }
]

```

Set the local path of NAS for data collection.

- Setting example for a case where camera data is output to the NAS for NW cameras

Device	IP address	Directory (SMB)	Directory (FTP)
NW camera (with serial number B8A44F78EB4D)	192.168.250.90	---	---
NAS for NW cameras	192.168.250.10	apb_tmp	---
NAS for data collection	192.168.250.20	---	C:/apb_tmp/Script
NX5	192.168.250.30	---	---

```
NXConfig = [
    {
        'nx5_ip_addr'      : '192.168.250.30',
        'save_path'        : 'C:/apb_tmp/Script/save',
        'ftp_log_path'      : 'C:/apb_tmp/Script',
        'ftp_bak_path'      : 'C:/apb_tmp/Script/Proj',
        'latest_bak_path'   : 'C:/apb_tmp/Script/latest',
        'bak_enable'        : True,
        'retry_sec'         : 10,
        'camera'            : [
            {
                'serial_name' : 'B8A44F78EB4D',
                'camera_name'  : 'Cam1',
                'smb_enable'   : True,
                'smb_ip_addr'  : '192.168.250.10',
                'smb_user'     : 'smbuser',
                'smb_password' : 'smbpassword',
                'smb_shared_dir' : 'apb_tmp',
                'path'         : ''
            }
        ]
    }
]
```

Set the SMB sharing path of NAS for NW cameras.

● Example settings when two NW cameras output camera data to the NAS for NW cameras

Device	IP address	Directory (SMB)	Directory (FTP)
NW camera (1) (with serial number B8A44F78EB4D)	192.168.250.90	---	---
NW camera (2) (with serial number B8A44F78EB4E)	192.168.250.91	---	---
NAS for NW cameras	192.168.250.10	apb_tmp	---
NAS for data collection	192.168.250.20	---	C:/apb_tmp/Script
NX5	192.168.250.30	---	---


```

NXConfig = [
    {'nx5_ip_addr'      : '192.168.250.30',
     'save_path'       : 'C:/apb_tmp/Script/save',
     'ftp_log_path'    : 'C:/apb_tmp/Script',
     'ftp_bak_path'    : 'C:/apb_tmp/Script/Proj',
     'latest_bak_path' : 'C:/apb_tmp/Script/latest',
     'bak_enable'      : True,
     'retry_sec'       : 10,
     'camera'          : [
        {
            'serial_name' : 'B8A44F78EB4D',
            'camera_name' : 'Cam1',
            'smb_enable'  : True,
            'smb_ip_addr' : '192.168.250.10',
            'smb_user'    : 'smbuser',
            'smb_password': 'smbpassword',
            'smb_shared_dir': 'apb_tmp',
            'path'        : ""
        },
        {
            'serial_name' : 'B8A44F78EB4E',
            'camera_name' : 'Cam2',
            'smb_enable'  : True,
            'smb_ip_addr' : '192.168.250.10',
            'smb_user'    : 'smbuser',
            'smb_password': 'smbpassword',
            'smb_shared_dir': 'apb_tmp',
            'path'        : ""
        }
    ]
}
]

```

Setting of NW camera (1) →

Setting of NW camera (2) →

● Example settings when there are two NX5

Device	IP address	Directory (SMB)	Directory (FTP)
NW camera (1) (with serial number B8A44F78EB4D)	192.168.250.90	---	---
NW camera (2) (with serial number B8A44F78EB4E)	192.168.250.91	---	---
NAS for data collection	192.168.250.10	C:/apb_tmp	C:/apb_tmp/Script
NX5 (1)	192.168.250.30	---	---
NX5 (2)	192.168.250.40	---	---

```

NXConfig = [
    {
        'nx5_ip_addr'      : '192.168.250.30',
        'save_path'        : 'C:/apb_tmp/Script/save',
        'ftp_log_path'      : 'C:/apb_tmp/Script',
        'ftp_bak_path'      : 'C:/apb_tmp/Script/Proj',
        'latest_bak_path'   : 'C:/apb_tmp/Script/latest',
        'bak_enable'        : True,
        'retry_sec'         : 10,
        'camera'            : [
            {
                'serial_name' : 'B8A44F78EB4D',
                'camera_name'  : 'Cam1',
                'smb_enable'   : False,
                'path'         : 'C:/apb_tmp'
            }
        ]
    },
    {
        'nx5_ip_addr'      : '192.168.250.40',
        'save_path'        : 'C:/apb_tmp/Script/NX5_2/save',
        'ftp_log_path'      : 'C:/apb_tmp/Script/NX5_2',
        'ftp_bak_path'      : 'C:/apb_tmp/Script/NX5_2/Proj',
        'latest_bak_path'   : 'C:/apb_tmp/Script/NX5_2/latest',
        'bak_enable'        : True,
        'retry_sec'         : 10,
        'camera'            : [
            {
                'serial_name' : 'B8A44F78EB4D',
                'camera_name'  : 'Cam2',
                'smb_enable'   : False,
                'path'         : 'C:/apb_tmp'
            }
        ]
    }
]

```

Setting of NW camera (1) →

Setting of NX5 (1)

Setting of NW camera (2) →

Setting of NX5 (2)

2-3-3 Setting Up Script Autorun

Create a batch file to automatically execute the script when the NAS for data collection is launched.

Creating a Script Execution Batch File

Create the “apb.bat” file which contains the following description in a directory on the NAS for data collection.

```

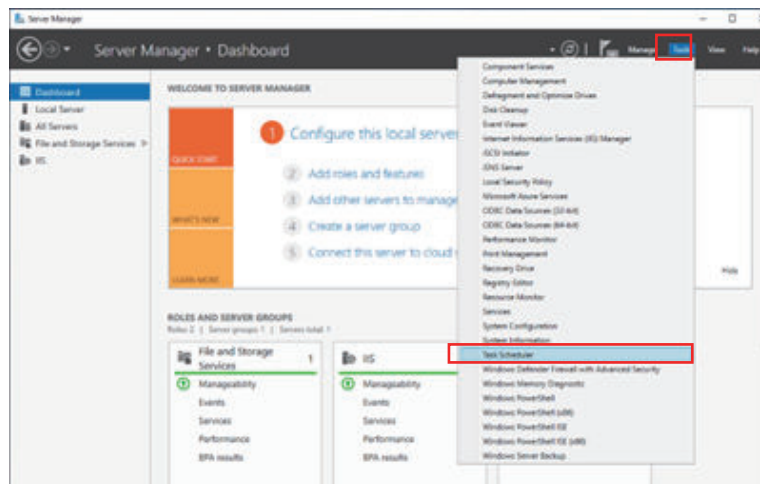
cd "C:\apb_tmp\Script"
python pbdata_collection.py

```

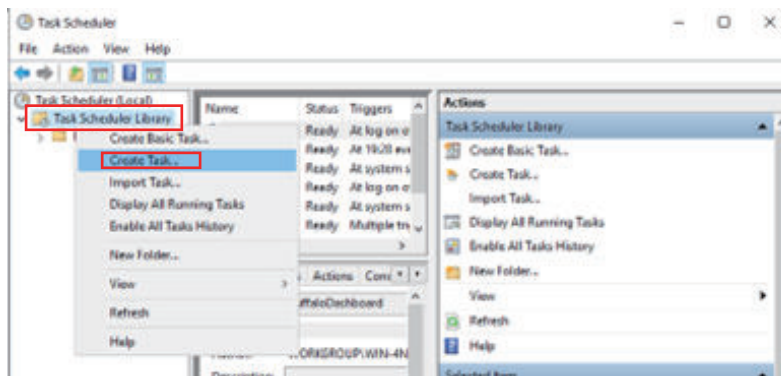
C:\lapb_tmp\Script represents the directory where the script is placed. Please change it according to your environment.

Setting Up Autorun at Startup

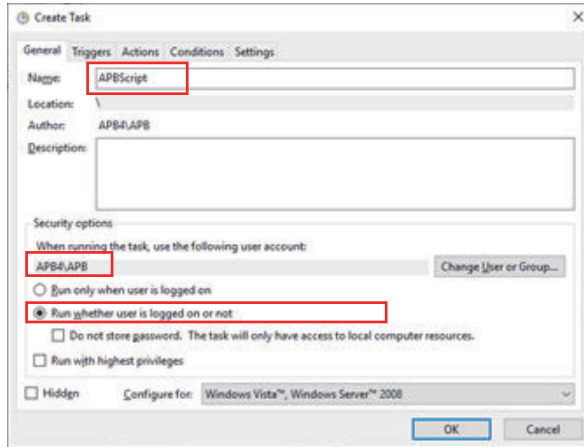
- 1 Open **Server Manager** and select **Task Scheduler** from the **Tools** tab in the top right of the window.



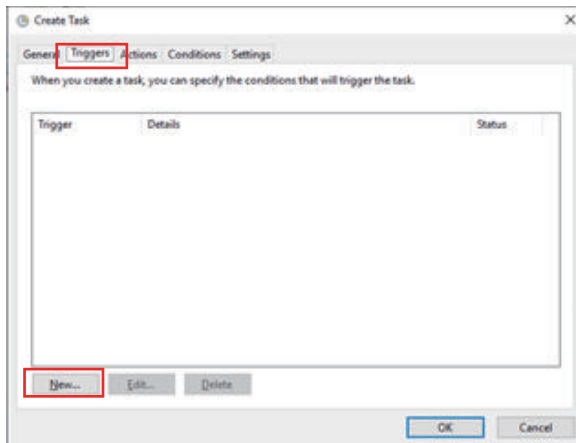
- 2 Right-click on **Task Scheduler Library** and select **Create Task**.



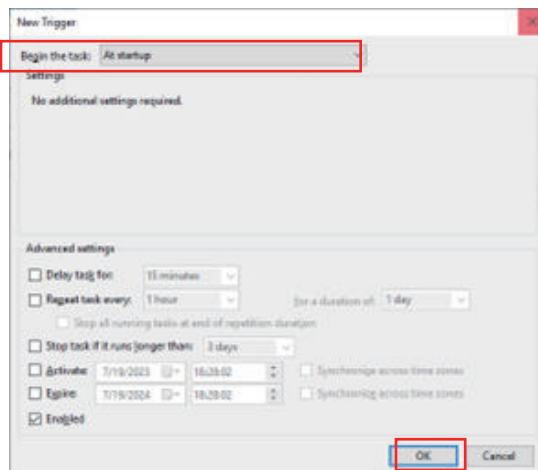
- 3 Enter the name you want to set for the task in the **Name** field, make sure that the correct user name is entered in the **When running the task, use the following user account** field, and select the **Run whether user is logged on or not** option.



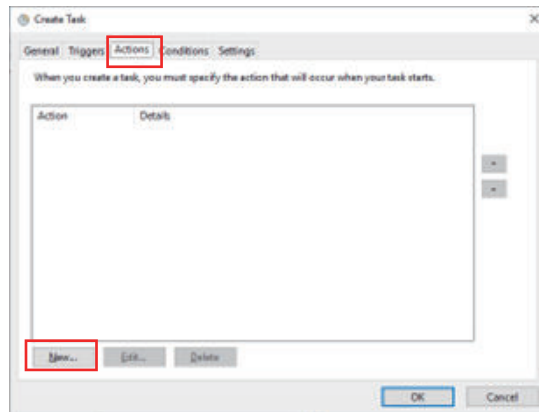
4 Select the **Triggers** tab, and then select the **New** button.



5 A new trigger is displayed, but do not configure it and just select the **OK** button .

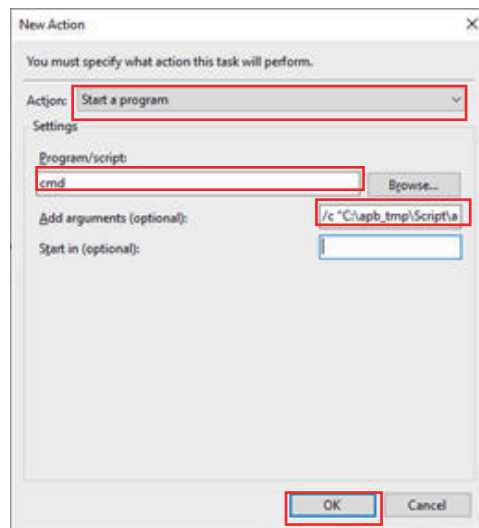


6 Select the **Actions** tab, and then **New** button.

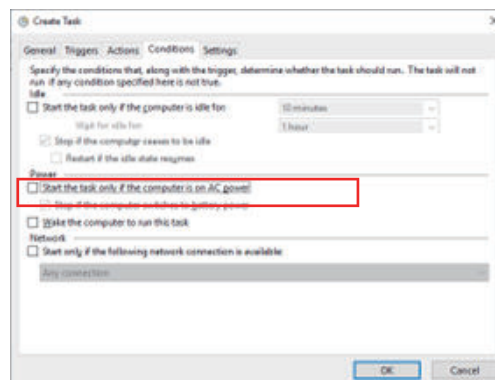


- 7** Click the Actions dropdown and choose **Start a program**. Enter “cmd” in the Program/script input box, and in **Add arguments (optional)** input box, enter “/c <absolute path of apb.dat>”, then select the **OK** button .

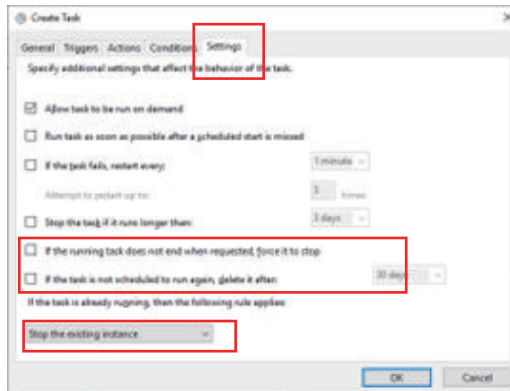
The following is an example configuration when apb.sh is placed in C:/apb_tmp/Script.



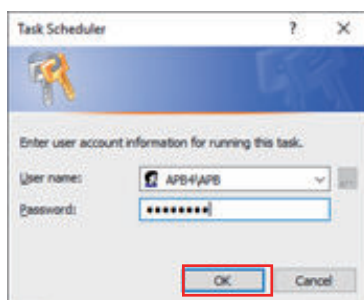
- 8** Select the **Conditions** tab and uncheck the **Start the task only if the computer is on AC power** checkbox.



- 9** Select the **Settings** tab and uncheck the **If the task is not scheduled to run again, delete it after:** and **If the running task does not end when requested, force it to stop** checkboxes. Also, click the pull-down for **If the task is already running, then the following rule applies:** and select **Stop the existing instance**, and then select the **OK** button .



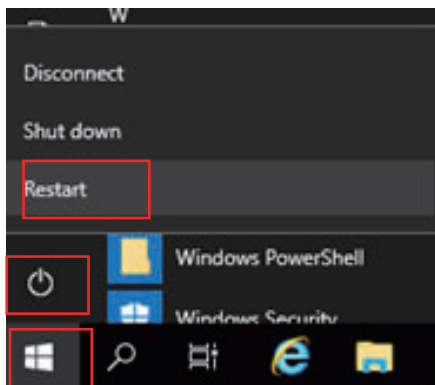
- 10** Enter the user name and password you want to set for the user account information, and then select the **OK** button.



2-3-4 Restarting NAS for Data Collection

Restart the NAS for data collection.

Select the power icon on the taskbar and select **Restart** menu from the displayed list to restart the NAS for data collection.



Additional Information

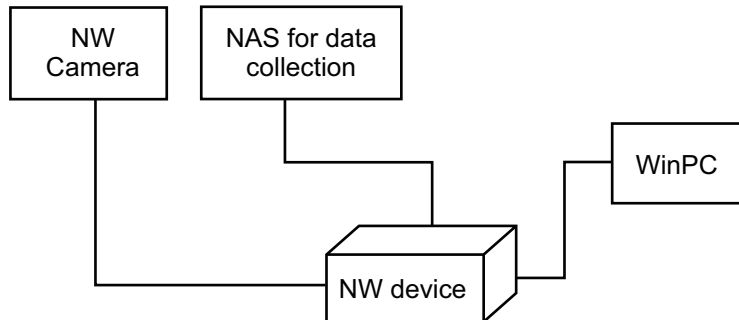
The script will run automatically from the next startup.

2-4 Setting the NW Camera

To set up an NW camera, use a computer on the same network.

In this document, settings are performed from a web browser using the WinPC.

Connect the NW camera to the NW device and perform the following steps.



Note that the network settings must be made in advance for the NW camera to be connected.

In this document, the procedure uses an example where the NAS is set as follows.

Item	Set value
Username	root
IP address	192.168.0.90
Subnet mask	255.255.255.0



Additional Information

- Depending on the camera model and OS version you are using, the setting items may differ. For details on how to update the firmware and how to set it according to the version, refer to the manual of your camera.
- An example of the camera setup procedure is also explained in *Automation Playback Camera Control Sample Programs INSTRUCTIONS (W641)*. Please refer to it as necessary.



Version Information

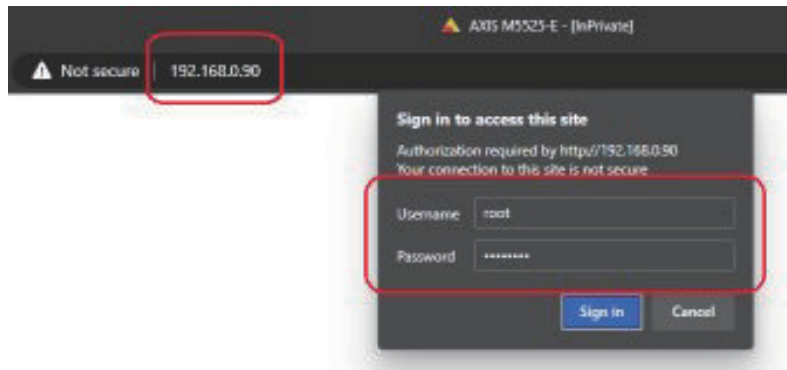
The camera's default IP Address varies depending on the camera's OS version. Please set the network settings of your computer according to the OS version of the camera within the range in the table below.

Camera's OS version	Camera's default IP Address	Examples of Computer Settings	
		IP address	Subnet mask
12.0 or higher	169.254.x.x	169.254.0.1	255.255.0.0
11.11 or lower	192.168.0.90 - 192.168.0.95	192.168.0.80	255.255.255.0

2-4-1 Connecting to NW Camera

Launch a web browser (e.g. Microsoft Edge) and enter the IP address of the NW camera in the address bar.

When you access the address, you are prompted to sign in. So enter the username and password and sign in.



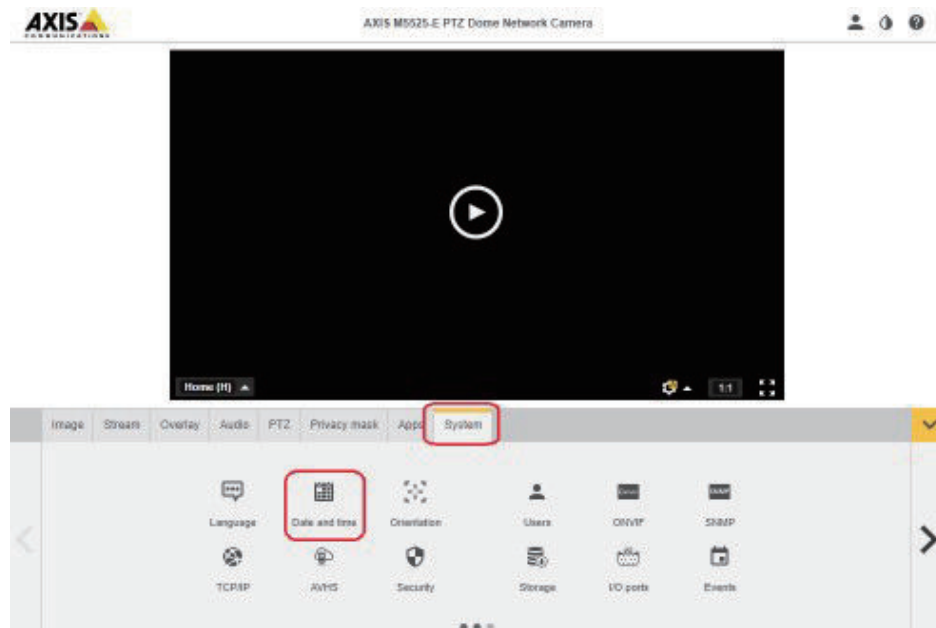
2-4-2 Setting the Time Zone

The Time Zone of the NW camera must be set to the same as the NX5.
To set the time zone, perform the following steps.

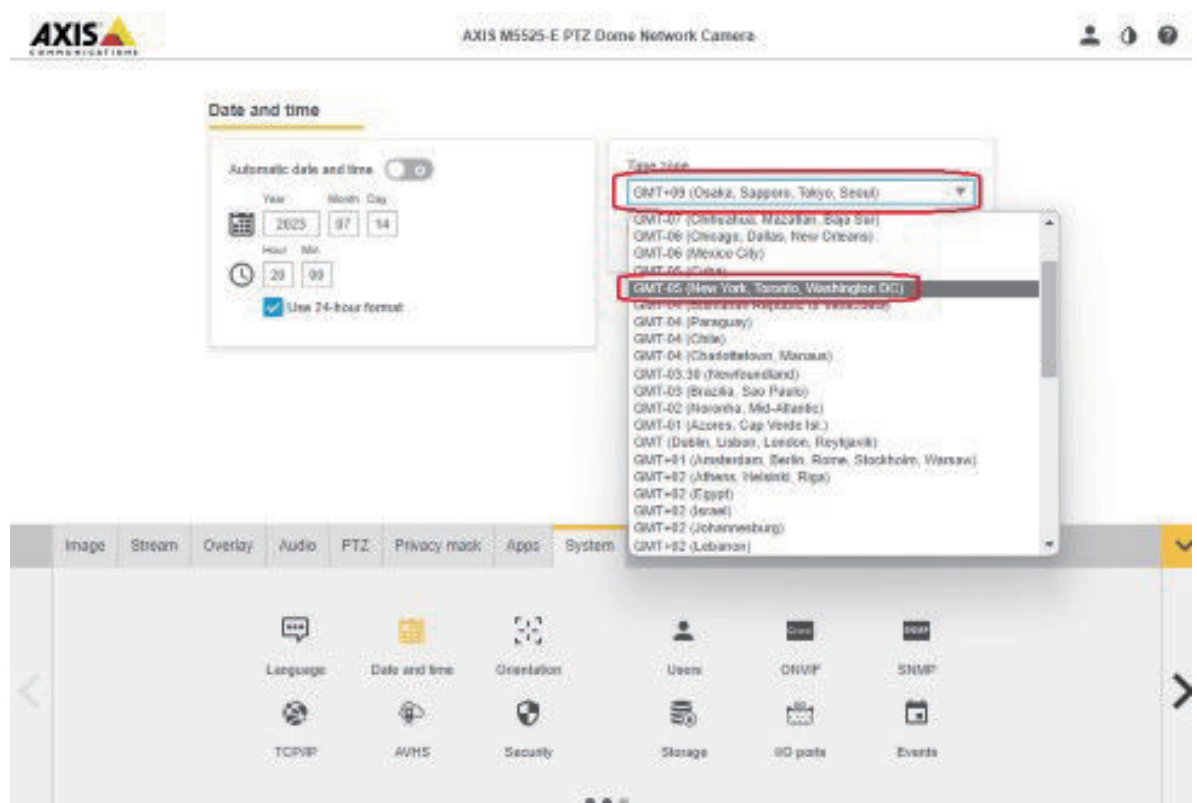
- 1 Select **Settings**.



- 2 Then select the **System** tab and **Date and time** menu.



- 3** Select a time zone from the pull-down menu of **Time zone**.



- 4** Once you determine the time zone, a pop-up appears to notify that the settings have been saved.



2-4-3 Creating Events

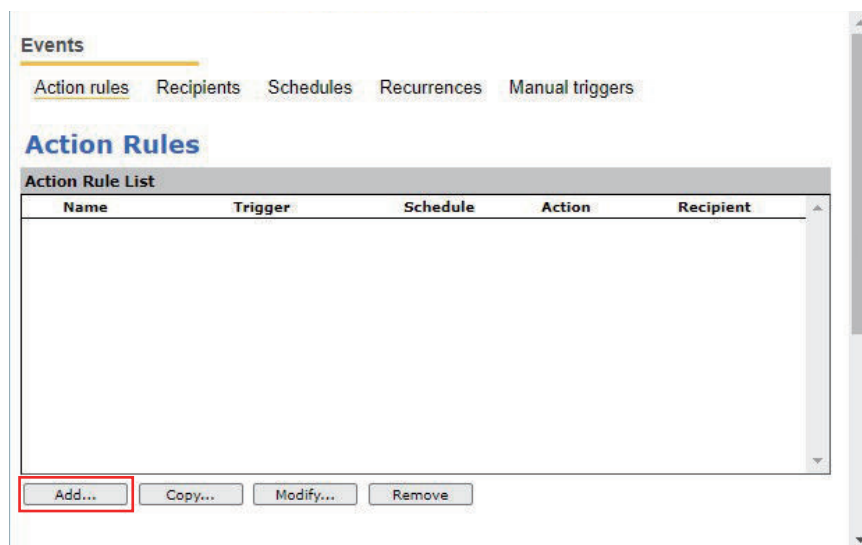
To send a trigger to the NW camera to output camera data, create an event (action rule). Note that the event settings must match the NX5 settings.

How to Create an Event

Select the **System** tab and select **Events**.



Select the **Add...** button.

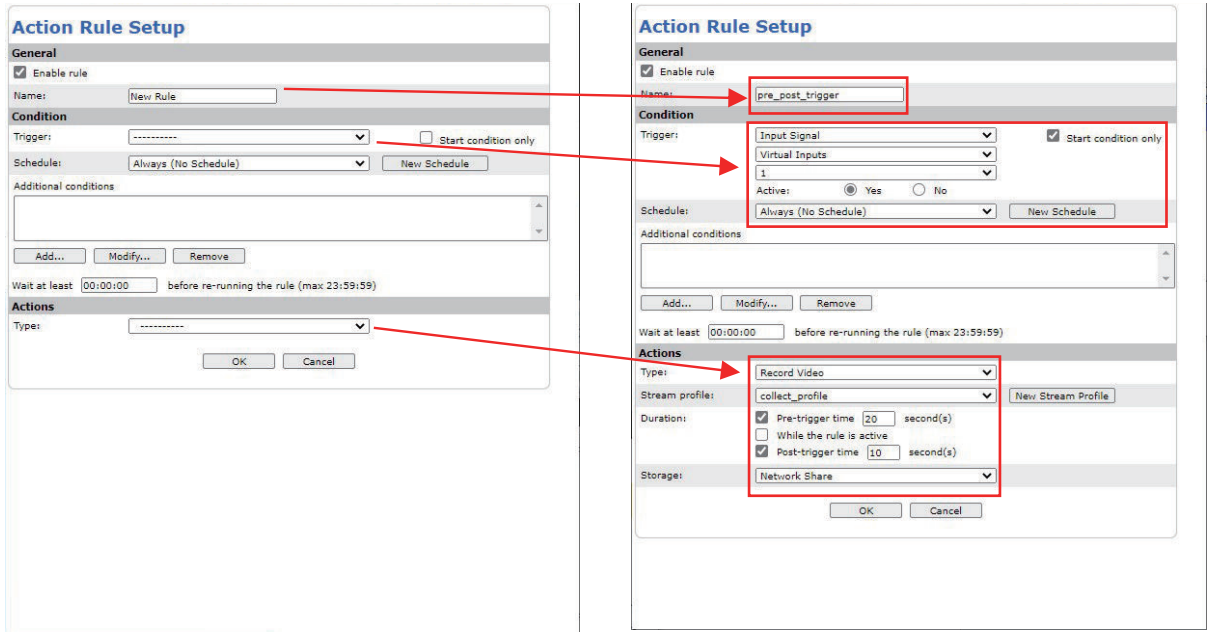


An example of setting up an event is shown below.

Configure the desired settings and select the **OK** button to register the event.

● Pre/Post trigger method

This method outputs camera data for the time before and after the timing when the trigger is sent to the NW camera.



Item	Parameter	Set value		Description
General	Name	pre_post_trigger		A name to identify the event
Condition	Trigger	Input Signal		The method of the trigger to be received
		Virtual Inputs		Set them as shown in the figure to receive triggers from the NX5
		1		Receive port number This setting must match the settings for the NX5.
		Start condition only	TRUE	When multiple triggers are received, processing for the second trigger is not performed until the first event is terminated.
	Schedule	Always (No Schedule)		Schedule to run the event Selecting this enables the event always.

Item	Parameter	Set value		Description
Actions	Type	Record Video		Settings for saving camera data
	Stream profile	collect_profile (created profile)		Specifies a setting profile for saving videos. For details, refer to <i>Configuring Profiles</i> on page 2-44
	Duration	Pre-trigger time	TRUE 20	If While the rule is active is FALSE, set how many seconds of camera data is saved prior to the trigger reception timing. This setting must match the settings for the NX5. In this example, it is set to 20 seconds.
		While the rule is active	FALSE	Camera data while the receive trigger value is active is saved.
		Post-trigger time	TRUE 10	If While the rule is active is FALSE, set how many seconds of camera data is saved after the trigger reception timing. This setting must match the settings for the NX5. In this example, it is set to 10 seconds.
	Storage	Network Share		Set the save destination of the camera data. This parameter must be set to save the data to NAS. Refer to <i>2-4-5 Setting the Output Destination of Camera Data</i> on page 2-45 for how to set the save destination.



Additional Information

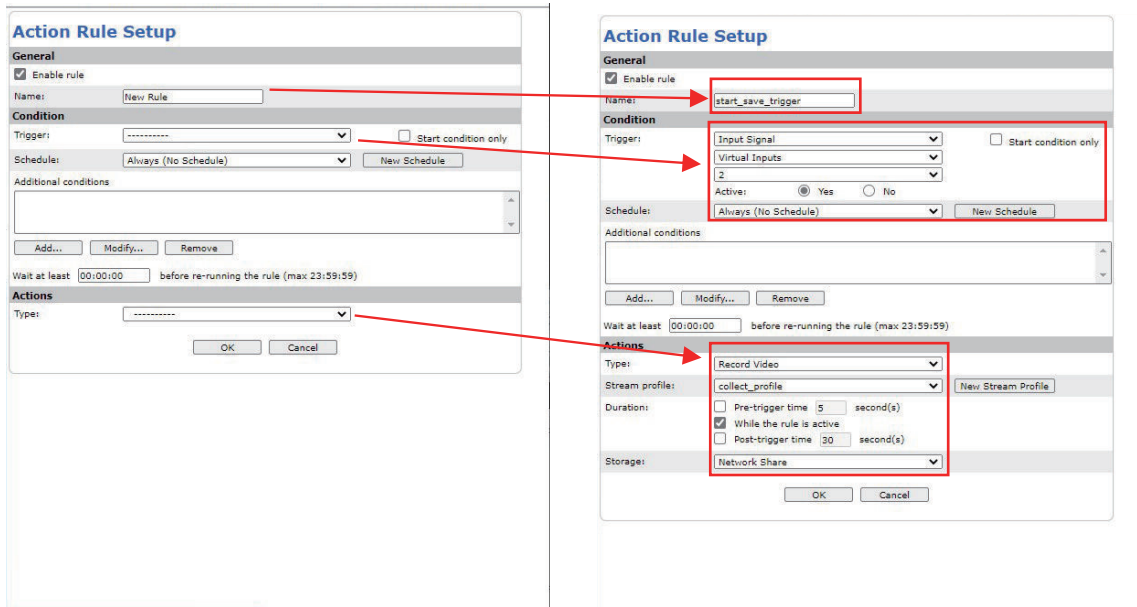
You may not be able to save the camera data for the time length specified in **Pre-trigger time**, depending on the camera model and subject of video.

In such cases, the remedies are as follows.

- Have the camera constantly record video.
 - Use the file split option (described later) of the NW camera to set the camera data to be split and saved. For example, set the NW camera data to be split every 10 seconds.
- Collect the camera data only for the period of time that corresponds to the variable log of this system.
 - Collect camera data for the period of time that corresponds to the variable log among the camera data divided in the previous section, and combine them into one camera data.
 - For example, if 5 minutes of camera data is split into 10-second segments, the segments will be combined into one video file, and the video file is saved in the directory specified in the script setting.
- Periodically delete camera data.
 - Set the camera data output destination of the NW camera to automatically delete the recorded data. For example, the retention period can be set to one day.

● Start/Save trigger method

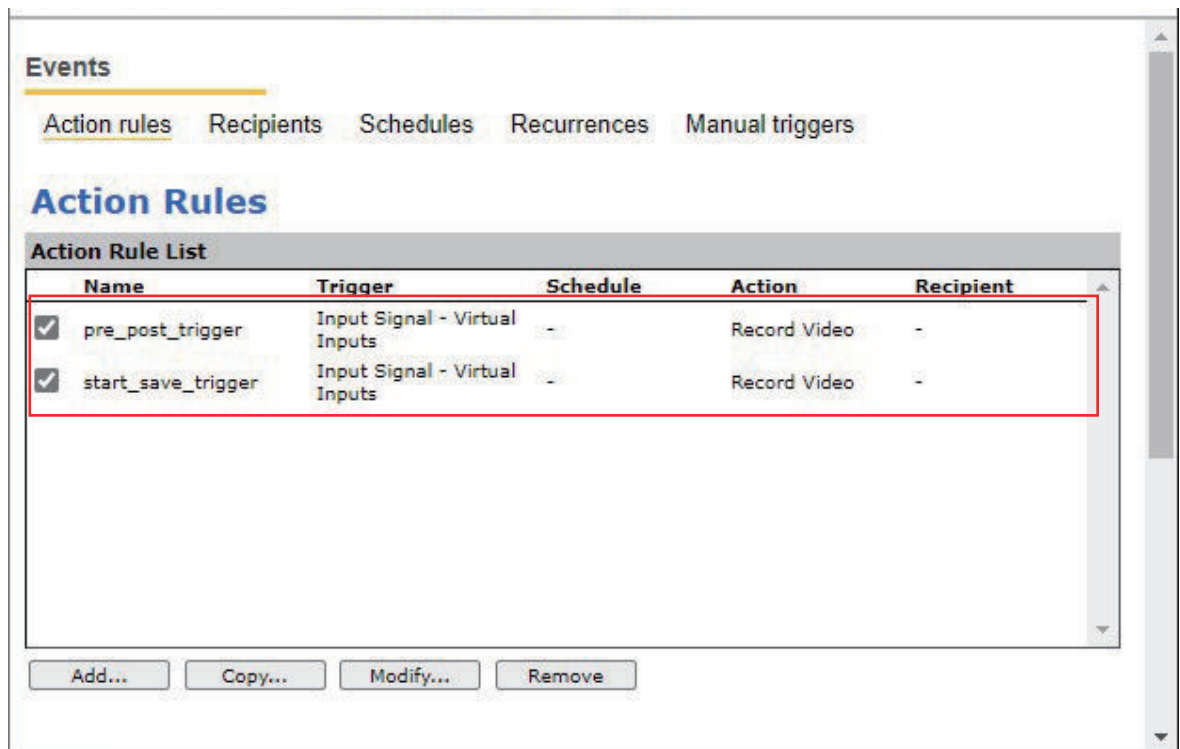
This method outputs camera data from the timing when the trigger is sent to the NW camera until the NW camera receives the next trigger.



Item	Parameter	Set value		Description
General	Name	start_save_trigger		A name to identify the event
Condition	Trigger	Input Signal		The method of the trigger to be received
		Virtual Inputs		Set them as shown in the figure to receive triggers from the NX5
		2		Receive port number This setting must match the settings for the NX5.
		Start condition only	FALSE	When multiple triggers are received, processing for the second trigger is not performed until the first event is terminated.
	Schedule	Always (No Schedule)		Schedule to run the event Selecting this enables the event always.

Item	Parameter	Set value		Description
Actions	Type	Record Video		Settings for saving camera data
	Stream profile	collect_profile (created profile)		Specifies a setting profile for saving videos. For details, refer to <i>Configuring Profiles</i> on page 2-44
	Duration	Pre-trigger time	FALSE	You can optionally set how many seconds of camera data before the first trigger reception timing will be saved when While the rule is active is set to TRUE. In this example, it is disabled.
		While the rule is active	TRUE	Camera data while the receive trigger value is active is saved.
		Post-trigger time	FALSE	You can optionally set how many seconds of camera data after the second trigger reception timing will be saved when While the rule is active is set to TRUE. In this example, it is disabled.
	Storage	Network Share		Set the save destination of the camera data. This parameter must be set to save the data to NAS. Refer to 2-4-5 <i>Setting the Output Destination of Camera Data</i> on page 2-45 for save destination settings.

To enable the event, select the check box to the left of the registered event.



Configuring Profiles

You can set the stream profiles of the camera data and save them individually as profile settings. Parameters can be set as follows.

Stream Profile Settings

Stream Profile

Profile name: Video encoding:

Description:

Image **Audio** **H.264** **MJPEG**

Image Appearance

☒ Resolution: pixels

☒ Compression: [0..100]

Video Stream

☒ Maximum frame rate:

☒ Unlimited

☐ Limited to [1..30] fps

Overlay Settings

☒ Text and/or image overlay

☐ Include date ☐ Include time

☐ Include text:

Text overlay size:

Text color: Text background color:

Place text/date/time at of image

☐ Include image overlay (using default image and coordinates).

Preview

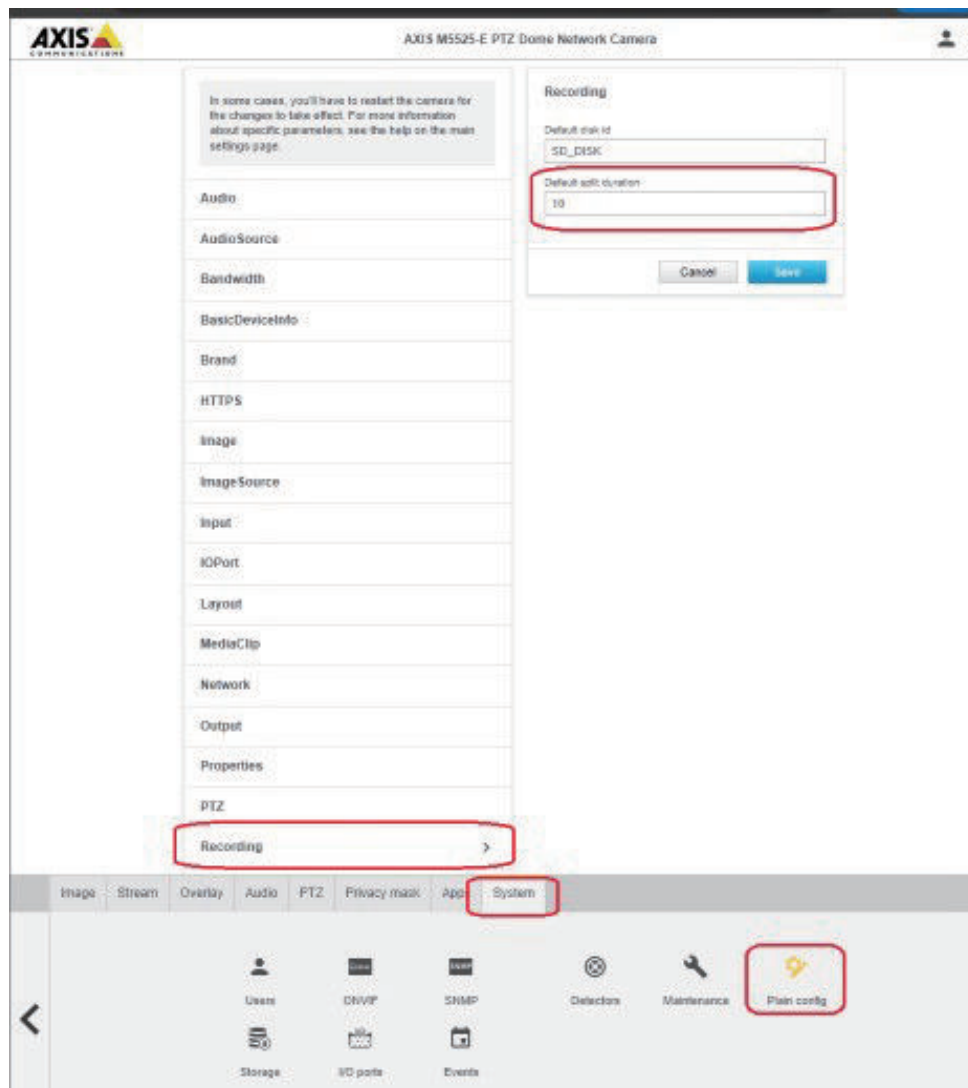
View image while configuring.

Item No.	Parameter	Description
(1)	Profile name	A name to identify the profile
(2)	Video encoding	This is the video encoding setting. Select H264 for this setting.

2-4-4 File Split Saving Method (Optional)

To divide the camera data to be saved at specific time intervals, the following settings must be made.

- 1 Select **Plain setting** in the **System** tab.
- 2 From the list of Plain settings, select **Recording**.
The screen for changing settings is displayed on the right side of the list.
- 3 Enter the desired number of seconds for **Default split duration** and select the **Save** button.
In the example below, it is set to 10 seconds.

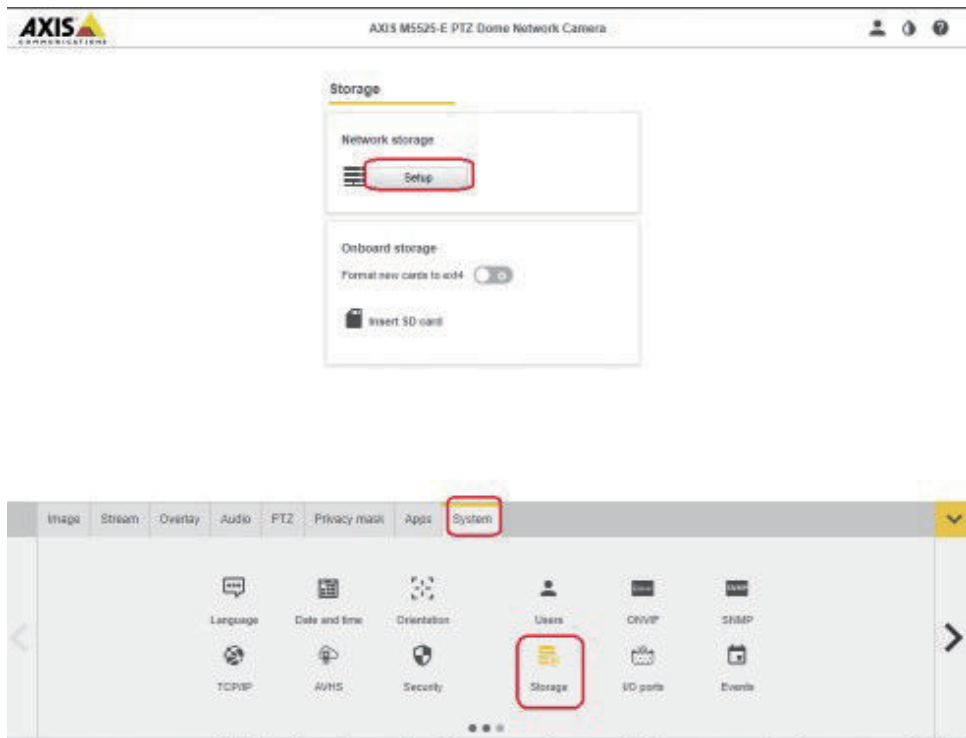


4 To enable the setting, the NW camera must be restarted.

2-4-5 Setting the Output Destination of Camera Data

To output the camera data of the NW camera to the NAS for data collection or the NAS for NW cameras, set the network storage settings.

- 1 Select the **System** tab and then **Storage** to display the setting screen.
- 2 Select the **Setup** button under **Network storage**.



- 3 Enter the IP address of the NAS to be set as the output destination in **Host** and the shared directory name in **Share**, and select the toggle switch for **The share requires login**.
- 4 Next, in **Username** and **Password**, enter the user name and password that you registered for the NAS to be set as the output destination. When you enter them, click the **Connect** button.

Storage

Network storage

Host
192.168.0.21

Share
apb_tmp

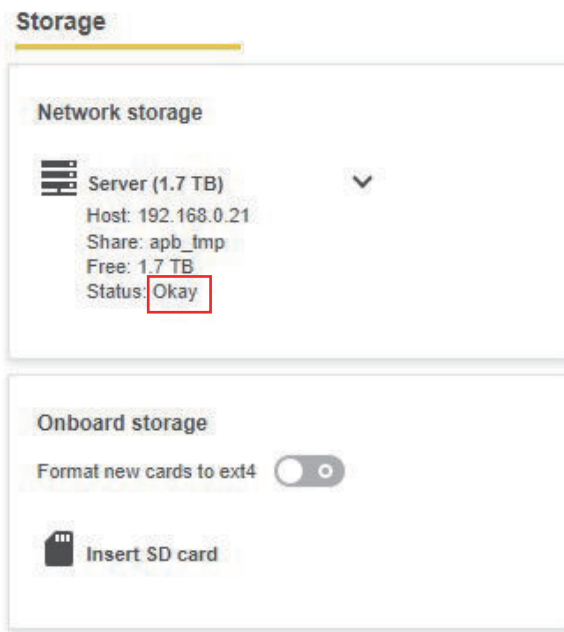
The share requires login ☒

Username
APB

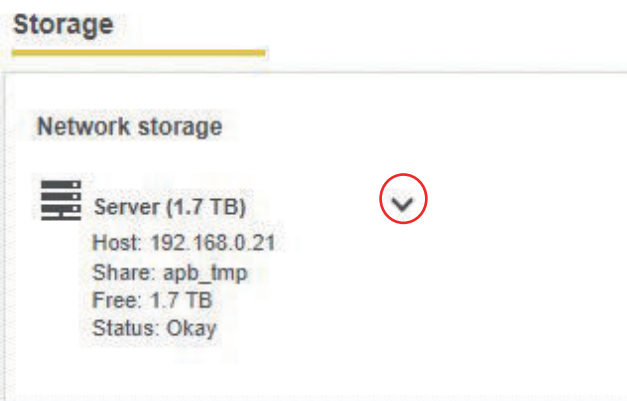
Password

Cancel Connect

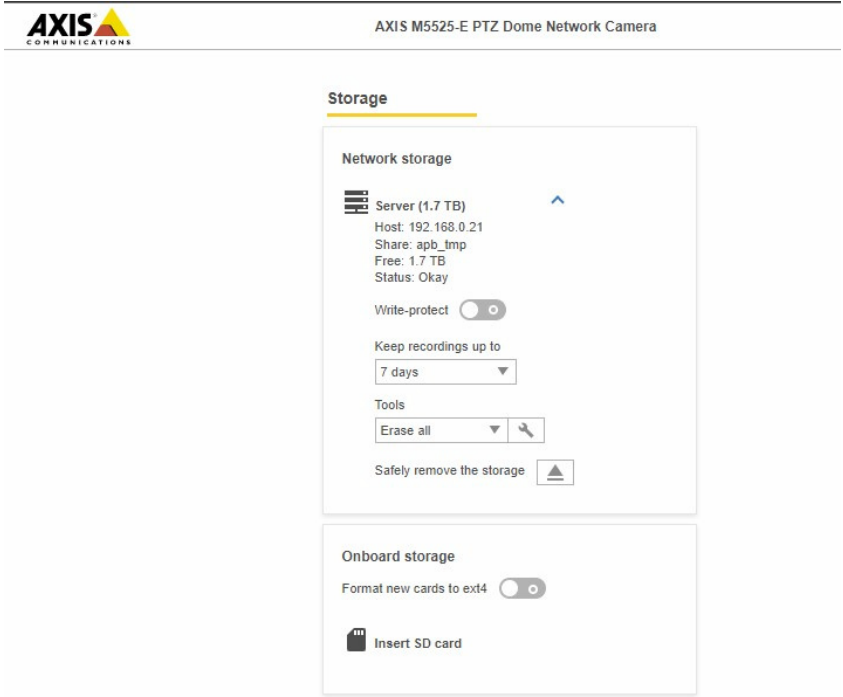
- 5 When the Status says OK, connection is confirmed.



- 6** Next, set the retention period for the recorded data. Click the **v** mark next to the **Server**.



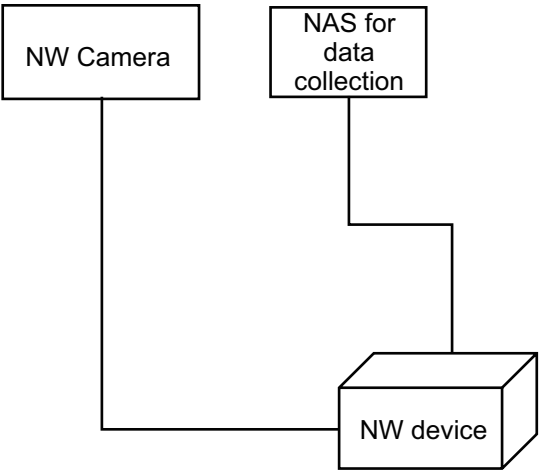
- 7** Set the retention time for the recorded data.



Additional Information

In this system, among the recorded data output by the camera to the **Shared directory** set here, the recorded data for the relevant time period of the variable log is copied to the specified area in the script setting file. If the recorded data is used only for playback with the automation playback, you can shorten the file retention period of **Shared directory** to secure storage space on the NAS.

- 8 Disconnect the WinPC from the network.



The NW camera setup is now complete.

2-4-6 How to Set the Second and Subsequent Cameras

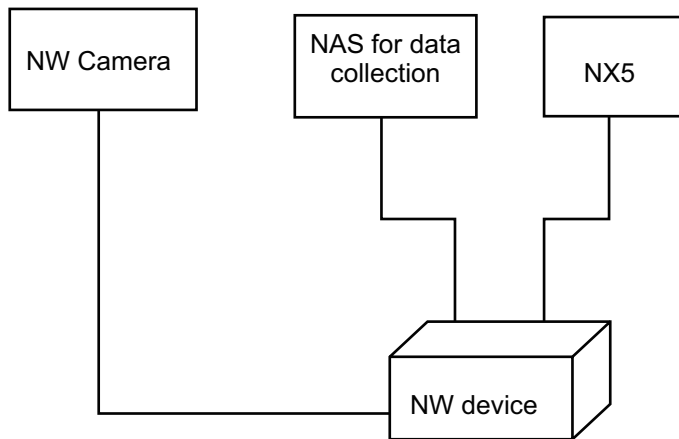
If you want to add a new camera, perform the steps from *2-4-1 Connecting to NW Camera* on page 2-35 to *2-4-5 Setting the Output Destination of Camera Data* on page 2-45 for each NW camera. However, the IP address of the NW camera must be set to a value that is different from the IP address of the other NW cameras and devices.

2-5 Connecting an NX5

Connect the NX5 to the network to which devices are connected, and start it up.

When the NX5 sends variable logs to the FTP site in the NAS for data collection (FTP server specified in the script setting file of this systems), this system starts to operate.

Note that the NX5 settings must be set in advance.



2-5-1 Transferring Project Backup Files from NX5 to NAS

Reference the program POU with the POU name ProjectUpload among the sample programs. Change the following initial values for the NAS for data collection (FTP server).

```

// Initialize target FTP server setting
IF P_First_RunMode OR UP_Q THEN
  // [TODO] Initialize parameters
  FTPAddr.Adr := '192.168.250.10'; // [TODO] IP address of FTP server
  FTPAddr.UserName := 'ftpuser'; // [TODO] User name of FTP server
  FTPAddr.Password := 'ftppassword'; // [TODO] Password of FTP server.
  F_PATH:='apb_tmp/Proj'; // [TODO] Target directory name for saving backup file
  s.
  : (Omitted hereinafter)
  
```

2-5-2 Transferring Variable Logs from NX5 to NAS

Reference the program POU with the POU name VarLogUpload among the sample programs. Change the following initial values for the NAS for data collection (FTP server).

```

// Initialize target FTP server setting
IF P_First_RunMode OR UP_Q THEN
  // [TODO] Initialize parameters
  FTPAddr.Adr := '192.168.250.10'; // [TODO] IP address of FTP server
  FTPAddr.UserName := 'ftpuser'; // [TODO] User name of FTP server
  FTPAddr.Password := 'ftppassword'; // [TODO] Password of FTP server.
  F_PATH:='apb_tmp/VarLog1'; // [TODO] Target directory name for saving variable
  log files.
  : (Omitted hereinafter)
  
```

3

Script Specifications

3

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3-1 Structure of Files to Be Collected

The file structure of the playback data that is collected by the script in this system is as follows.
The codes in the table below are used for clock information (timestamp) in the file names.

Code	Definition
YYYY	Represents four digits of the year
MM	Represents two digits of the month
DD	Represents two digits of the day
HH	Represents two digits of the hour
mm	Represents two digits of minute
SS	Represents two digits of second

3-1-1 Backup File

The backup file includes backup data of the NX5 project files.

The files are sent to the NAS for data collection from the NX5 by FTP.

To send the backup files, transfer destination set on the NX5 and backup file FTP path set in the script setting file must be identical.

The backup file includes the following three files.

File name	Overview
NXBackup.dat	Backup file
RestoreCommand.ini	Backup information file
AutoloadCommand.ini	

3-1-2 Variable Log (Variable Log File)

The variable log (variable log files) contains time-series changes in variables controlled by the NX5.

The files are sent to the NAS for data collection from the NX5 by FTP.

To send the variable log files, transfer destination set on the NX5 and the variable log FTP path set in the script setting file must be identical.

The variable log includes the following two files.

The names before the extensions of the two files are identical.

File name	Overview
VL_YYYYMMDDHHmmSS.bin	Variable log file
VL_YYYYMMDDHHmmSS.ini	Variable log information file

3-1-3 Camera Data

The camera data includes the video files and meta data output by the NW camera.

They are output from the NW camera to the NAS for data collection or the NAS for NW cameras by SMB.

To send the data, transfer destination set on the NW camera and the camera data path set in the script setting file must be identical.

The profile of the video to be output (encoding, frame rate, length, etc.) must be set on the NX5 and NW camera.

"SERIALNAME" is a serial number that is uniquely assigned to each NW camera.

"TOKENID" is a video token ID that is set each time the NW camera executes a camera data output event.

If you have configured splitting of NW camera data, a directory is created for each split time and a set of video file and meta data will be output for the split time.

The video file and data name before the extension will be identical.

Directory and file name						Overview		
axis-SERIALNAME/						Directory for each camera		
	YYYYMMDD/					Directory for clock time		
		HH/						
			YYYYMMDD_HH:mm:ss_TOKENID_SERIALNAME/				Directory for each camera data output event	
				YYYYMMDD_HH/				Directory by clock time
					YYYYMMDD_HH:mm:ss_TOKENID.mkv			
				YYYYMMDD_HH:mm:ss_TOKENID.xml		Meta data		

3-2 Files in the Data Collection Directory

The playback data retrieved by the script of this system is output under the save destination path directory set in the parameter setting file.

The file configuration is as follows.

“CAMNAME” is the camera name set in the script setting file.

The codes in the table below are used for clock information (timestamp) in the file names.

Code	Definition
YYYY	Represents four digits of the year
MM	Represents two digits of the month
DD	Represents two digits of the day
HH	Represents two digits of the hour
mm	Represents two digits of minute
SS	Represents two digits of second

Directory and file name			Overview
Save destination path/			Directory specified for save destination path
	YYYYMMDDHHmmSS/		Directory for storing retrieved playback data The directory name is the same as the clock time information in the variable log.
	Proj/	Directory for backup files If file backup is not enabled, this file is not created.	
		NXBackup.dat	Backup files transferred from the NX5
		RestoreCommand.ini	Untransferred backup files are not placed.
		AutoloadCommand.ini	
	VL_YYYYMMDDHHmmSS.bin		Variable log forwarded from the NX5
	VL_YYYYMMDDHHmmSS.ini		
	CAM-NAME_YYYYMMDDHHmmSS.mkv		Video files that combine video files from camera data within a period of time If there are multiple cameras, files are created for the number of cameras. The clock time information of the file name is the same as the clock time information of the variable log.
	CAM-NAME_YYYYMMDDHHmmSS.xml		Meta data for CAMNAME_YYYYMMDDHHmmSS.mkv If there are multiple cameras, files are created for the number of cameras. The clock time information of the file name is the same as the clock time information of the variable log.

3-3 Script Operating Specifications

The operation specifications of this system script are as follows.

3-3-1 Starting Conditions

The script is executed when the NAS for data collection is launched.

3-3-2 Stop Conditions

The script stops when the NAS for data collection stops or if an error occurs during script execution that makes it impossible to execute the script.

To resume the execution of the script, restart the NAS for data collection.

3-3-3 Operation Status File

To notify the operation status of the script, the script creates an operation status file in the same directory as the script.

The operation status file records errors detected during execution of the script, in addition to the operation status.

The operation status file includes the following four types of files.

Depending on the operation status of the script, either a running.log or a stopped.log is created.

File name	Description
running.log	This file is created when the script is in execution.
stopped.log	This file is created when the script encounters an error that makes it impossible to continue execution and stops.
running_bak.log	This is a renamed file of the running.log that was output when the previous script was executed.
stopped_bak.log	This is a renamed file of the stopped.log that was output when the previous script was executed.

3-3-4 Error Code

The error log recorded in the operating status file contains error codes and error details.

The details of the error and the behavior of the script upon error detection are as follows.

Error code	Error description	Behavior when an error occurs
001	The script setting file does not exist.	Script stops.
002	Required parameters are not set in the script setting file, or a syntax error occurs.	Script stops.
003	An access to the camera data path set in the script setting file fails when the script is executed.	Script stops.
004	Creating, deleting, moving, or copying directories or files fails when the script is being executed.	Script stops.
005	Other errors are detected.	Script stops.

Error code	Error description	Behavior when an error occurs
101	Different variable logs are received while two variable log files for the same clock time have not been obtained.	Script does not stop. Data is not collected and stored.
102	Variable log files fails to open or are not made in the correct format.	Script does not stop. Data is not collected and stored.
202	The timestamp directory to be created already exists in the save destination path.	Script does not stop. Existing directories is deleted and data is collected and stored.
203	Backup files are enabled in the script setting file, but backup files are not transferred, or the three files are not obtained.	Script does not stop. Only transferred backup files are collected and stored.
204	An access to the camera's video storage directory fails when data is collected and stored.	Script does not stop. Data is collected and stored, but camera data up to the time when data collection is completed is placed in the save destination path. Camera data will not be merged.
205	Files for the required of time length are not obtained in the camera data path.	Script does not stop. Data is collected and stored, but Camera data up to the time when it is collected is merged.
206	Merging data fails due to corruption of collected camera data, etc.	Script does not stop. Data is collected and stored, but Camera data will not be merged.

4

About Open Source License

4-1	Used Open Source License.....	4-2
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4-1 Used Open Source License

The table below lists the open source used by the script on this system, and versions and licenses as they are verified for operation.

Open source name	Version	License
moviepy	1.0.3	MIT License
pysmb	1.2.9.1	zlib/libpng License
python-dateutil	2.8.2	Apache Software License, BSD License
tzlocal	4.2	MIT License
watchdog	2.3.1	Apache Software License

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Tel: (65) 6835-3011 Fax: (65) 6835-3011

OMRON ELECTRONICS LLC

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