Network Video Recorder Service

V 1.0

October 14, 2024

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Minimum Hardware Requirements

• Processor (CPU):

Intel Core i3 or equivalent (Quad-core recommended for smoother performance with multiple streams)

• Memory (RAM):

8 GB minimum (16 GB recommended for handling multiple streams)

• Storage:

250 GB HDD or SSD minimum (higher storage capacity recommended based on the number of cameras and retention time)

 Recommended: 1TB or larger for extended recording and high-resolution streams

• Network:

Gigabit Ethernet connection (recommended) for stable and fast data transfer from network cameras

• Graphics (GPU):

Integrated GPU is sufficient for most cases; a dedicated GPU (e.g., NVIDIA GTX 1050 or higher) is recommended for hardware-accelerated video processing, playback, and larger installations

• Camera Input:

Network Interface Card (NIC) for IP camera streams (must support RTSP protocol)

• Power Supply:

Sufficient wattage to support all system components, including hard drives and network peripherals (typically 500W minimum)

Minimum Software Requirements

• Operating System:

Windows 10 or Windows Server 2016 and above (64-bit)

- .NET Framework:
 .NET Framework 4.8 or later
- Network Video Recorder (NVR) Software: Experts in Software Engineering NVR Service

• Additional Software:

FFmpeg or other media libraries (optional, for video transcoding and processing)

• Media Player Compatibility:

Any media player capable of playing H.264 codec (e.g., VLC, Windows Media Player with codec packs)

Additional Notes

• Recording Resolution and Frame Rate Considerations:

The higher the resolution and frame rate, the more demanding the system requirements. Ensure that your hardware is adequate for your specific use case (e.g., recording in 1080p at 30 FPS vs. 4K at 60 FPS).

• Storage Scaling:

Storage requirements will scale with the number of video streams and the retention period. For longer retention or higher quality recordings, ensure ample disk space is available. This setup ensures that your NVR Service will run smoothly, offering reliable video recording, storage, and playback for your operations.

Installing the NVR Service

Run the NVR Service Installer

TNVR Service		_		×
Welcome to the NVR Serv	ice Setup W	izard	(
The installer will guide you through t computer.	he steps required	d to install NVR Serv	rice on yo	ur
WARNING: This computer program i treaties. Unauthorized duplication or result in severe civil or criminal pena possible under the law.	is protected by c distribution of thi Ities, and will be	opyright law and inte s program, or any pe prosecuted to the m	ernational ortion of it, naximum e	may extent
	< Back	Next >	Cano	cel

Specify the Installation Directory

TNVR Service			_		×
Select Installation Folder					
The installer will install NVR Service t	to the following fol	der.			
To install in this folder, click "Next". T "Browse".	o install to a differe	ent folder, ente	er it bel	low or cli	ck
<u>F</u> older:					
ram Files∖Experts In Software Eng	jineering, LLC\N∨	R Service\	В	rowse	
			Di	sk Cost	
Install NVR Service for yourself, or f	or anyone who use	es this compute	er:		
 Everyone 					
◯ Just me					
	< Back	Next >		Cance	əl

Confirm the Installation

T NVR Service		_		×
Confirm Installation				5
The installer is ready to install NVR S	ervice on your co	omputer.		
Click "Next" to start the installation.				
	< Back	Next >	С	ancel

Installation Complete

NVR Service			—		×
Installation Complete					
NVR Service has been successfully in	nstalled.				
Click "Close" to exit.	·				
Please use Windows Update to check	k for any critical	updates to the .	NET F	Framewo	rk.
	< Back	Close		Canc	el

Configuring the NVR

The NVR configuration is changed via the NVR Config utility.

NVR Config	NVR Configuration (Not Registered) Licensed for 2 Cameras and Runtime 20 Minutes						
Camera	Camera Help						
	NVR	Camera 1 Camera 2					
		Root Directory	\NVR				
		Maximum Storage Days	7				
		Camera Reconnect Delay	30				
		Enable UDP Service Heartbeat	False				
		Heartbeat Broadcast Port	25600				
		Heartbeat Repeat Internal MS	15000				
		SAVE	EXIT				

NVR Settings

The following settings can be configured for your Network Video Recorder (NVR) service. These options allow you to customize how your service manages video storage, camera reconnection behavior, and heartbeat functionality.

- Root Directory
 - **Description**: This is the base folder where all recorded video files will be stored. The service organizes and stores videos within this folder.
 - **Default Value**: \NVR
 - **Customizing**: You can change this to any valid directory path on your system if your service requires a different storage location for video files.
- Maximum Storage Days
 - **Description**: This setting controls how long video files will be kept on the system before being deleted automatically. Files older than the specified number of days will be deleted to free up space.
 - **Default Value**: 7 days
 - **Customizing**: Adjust this value based on your retention policy. For example, if you want to keep videos for 30 days, set this value to 30.
- Camera Reconnect Delay (Seconds)
 - **Description**: This setting specifies the delay, in seconds, before the service attempts to reconnect to a camera after it has been disconnected. This helps avoid immediate reconnection attempts that may fail.
 - **Default Value**: 30 seconds
 - **Customizing**: If your network or cameras require a longer delay before reconnecting, you can increase this value.

• Enable UDP Service Heartbeat

- **Description**: When enabled, the service will send out heartbeat messages via UDP to indicate that it is active and running. This is useful for monitoring the status of the service from other systems on the network.
- **Default Value**: Disabled (false)
- **Customizing**: Set this to true if you want to enable the heartbeat functionality for service health checks.
- Heartbeat Broadcast Port
 - **Description**: This defines the UDP port that will be used to broadcast the heartbeat messages. Other systems on the network can listen to this port to monitor the service's activity.
 - Default Value: 25600
 - **Customizing**: You can change this to any valid UDP port number that fits within your network's configuration.
- Heartbeat Repeat Interval (Milliseconds)
 - **Description**: This setting controls the interval, in milliseconds, between consecutive heartbeat messages. It determines how often the service sends heartbeat notifications.

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- **Default Value**: 15,000 milliseconds (15 seconds)
- **Customizing:** If you need more frequent or less frequent heartbeats, adjust this value accordingly. For example, setting it to 30,000 will send a heartbeat every 30 seconds.

Camera Setup

NVR Config	NVR Configuration (Not Registered) Licensed for 2 Cameras and Runtime 20 Minutes							
Camera	Camera Help							
	NVR	Camera 1 Camera 2						
		Enabled	True					
		Camera Name	Cam1					
		IP Address	192.168.1.10					
		OnVif Port	8899					
		Username	admin					
		Password	admin					
		Frames Per Second	10					
:		Video Width	704					
:		Video Height	576					
		Bitrate (kbps)	1500					
		Encoding Interval	1					
		GOP Length	1					
		Video Quality	4					
		Timezone	EST					
r.								
		SAVE	EXIT	l				

Camera Settings

These settings define the configuration for each camera connected to your Network Video Recorder (NVR) service. Adjust these parameters to suit the specific camera's capabilities and your recording preferences.

- Enabled
 - **Description**: Determines whether this camera is enabled and active within the NVR system. When set to false, the camera is disabled and will not record or stream video.
 - **Default Value**: Disabled (false)
 - **Customizing**: Set this to true to enable the camera for use in the NVR system.
- Camera Name
 - **Description**: A user-defined name for the camera. This is how the camera will be identified within the system.
 - **Customizing**: Provide a meaningful name for easier identification of the camera (e.g., "Front Door Camera").
- IP Address
 - **Description**: The IP address assigned to the camera on the network. This is used by the NVR to communicate with the camera.
 - **Customizing**: Set the camera's unique IP address here (e.g., 192.168.1.100).
- OnVif Port
 - **Description**: The port number used for OnVif communication with the camera. This is typically set by the camera manufacturer.
 - **Default Value**: 8899
 - **Customizing:** Only change this if the camera requires a different port for OnVif communication.
- Username
 - **Description**: The username required to authenticate and access the camera's settings and video stream.
 - **Default Value**: admin
 - **Customizing**: Set the appropriate username that matches the camera's login credentials.
- Password
 - **Description**: The password required to authenticate and access the camera.
 - **Default Value**: admin
 - **Customizing**: Set the appropriate password for accessing the camera.
- Frames Per Second (FPS)
 - **Description**: Specifies the number of frames the camera will capture per second. Higher frame rates provide smoother video but require more bandwidth and storage.
 - Default Value: 10 FPS

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- **Customizing**: Adjust this based on your quality and storage preferences. For example, setting it to 30 FPS provides high-quality video.
- Video Width
 - **Description**: The width (in pixels) of the video resolution being captured. A higher width increases the video quality and file size.
 - **Default Value**: 704 pixels
 - **Customizing**: Set this based on the camera's resolution capabilities (e.g., 1280 for 720p resolution).
- Video Height
 - **Description**: The height (in pixels) of the video resolution being captured.
 - **Default Value**: 576 pixels
 - **Customizing**: Set this based on the camera's resolution capabilities (e.g., 720 for 720p resolution).
- Bitrate (kbps)
 - **Description**: The bitrate (in kilobits per second) that controls the video quality and file size. Higher bitrates result in better video quality but larger file sizes.
 - **Default Value**: 1500 kbps
 - **Customizing**: Adjust the bitrate to balance video quality and file size based on your storage capacity and network bandwidth.
- Encoding Interval
 - **Description**: Controls the interval for video encoding, which can affect the smoothness of the video stream. A lower value results in more frequent encoding.
 - Default Value: 1
 - **Customizing**: Adjust this setting if you need to modify the encoding performance for your camera.
- GOP Length (Group of Pictures)
 - **Description**: Defines the interval between keyframes in the video stream. A lower GOP length increases the number of keyframes, which can improve video quality but increase file size.
 - **Default Value**: 12
 - **Customizing**: Adjust this value if you want to optimize for higher quality or reduced file size based on your requirements.
- Video Quality
 - **Description**: A float value that controls the overall quality of the video. Higher values indicate better video quality.
 - **Default Value**: 4
 - **Customizing**: Increase or decrease this value based on your desired video quality.
- Timezone
 - **Description**: The timezone setting for the camera. This is used for timestamping video files and syncing with the NVR system.

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- **Default Value**: EST (Eastern Standard Time)
- **Customizing:** Set the appropriate timezone for your region (e.g., PST for Pacific Standard Time).

Software Registration

Registration	
Computer Id	7F436BC3FE990AA6
Registration Key	
REGISTER	EXIT

To activate your NVR Service:

- 1. Locate the **Computer ID** displayed in the registration window.
- 2. Enter the **Registration Key** provided by *Experts in Software Engineering, LLC* into the "Registration Key" field.
- 3. Once you've entered the key, click the **Register** button to activate the service.

If the registration is successful, you will have access to the full features of the NVR Service. If you encounter any issues, please contact *Experts in Software Engineering, LLC* for assistance.

Starting and Stopping the NVR Service

Services				_						
File Action View Help										
Services (Local)	O Services (Local)									
NVR Service	Name	Description	Status	Startup Type						
<u>Start</u> the service	0. 0.	States in cases of an inclusion of the local states of the local s	_	-						
Description: Network Video Recorder										
	NVR Service	Network Video Recorder		Automatic						

- Open the Services Window:
 - Press **Win + R** to open the Run dialog box.
 - Type services.msc and press Enter.
- Find the NVR Service:
 - In the Services window, scroll down to find the **NVR Service** in the list of services.
- Start the NVR Service:
 - Right-click on **NVR Service** and select **Start** to run the service.
- Stop the NVR Service:
 - If you need to stop the service, right-click on **NVR Service** and select **Stop**.
- Restart the NVR Service:
 - To restart the service, right-click on **NVR Service** and choose **Restart**. This will stop and start the service again automatically.

NVR Service Directory Structure



The NVR Service organizes recorded video files in a systematic folder structure based on the date and time the videos are captured. This helps in easy navigation and retrieval of specific recordings when needed.

• Root Folder (NVR):

- All video recordings are stored under the main folder, typically named **NVR**, which serves as the root directory for all recordings.
- Date Folder:
 - Within the NVR folder, there are subfolders representing specific **dates** in the format YYYYMMDD (Year-Month-Day).
 - For example, the folder **20241006** indicates that the recordings within this folder were captured on October 6th, 2024.
- Hour Folders:
 - Inside each date folder, subfolders are created for each hour during which recordings were made. The folders are named based on the hour of the day in a 24-hour format.
 - For instance, the folder **21** represents recordings made between **9:00 PM and 9:59 PM**.
- Video Files:
 - The actual video files inside each hour folder are named with a timestamp and camera identifier. The naming convention is typically in the format HHMMSS_CamX.h264, where:

- HHMMSS: Represents the exact **time** the recording started, in hours, minutes, and seconds.
- CamX: Represents the **camera name**. If left blank a default camera name will be used (ex: Camera1)
- .h264: Indicates the video format (H.264) used for recording.
- Videos are recorded in 5 minute segments.

This hierarchical structure allows for easy browsing by date and time to find specific video segments. The use of date and hour folders ensures that recordings are well-organized and easy to locate when reviewing footage.