

# SONY

Technical Guide | Network Video  
Recorder Enterprise Edition

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# System Design Requirements

Network Video Management System  
November 18, 2016  
NVMSTG006  
Revision 1.0.0

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# 1. Overview

## 1.1. About This Document

This document summarizes the information required when designing a system for Network Video Recorder Enterprise Edition. It describes the recommended installation environment, specifications, and storage design for the unit as well as the recommended system design for better security.

## 1.2. Related Documents

In addition to this document, the following documents are provided on the Web. Download the necessary documents from the following URLs.

- NVMS Enterprise Edition Administrator Manual
- NVMS Enterprise Edition Installation Manual  
<https://www.sony.net/CameraSystem/NVMS/Manuals>
- NVMS Enterprise Edition Compatible Peripherals List  
<https://www.sony.net/CameraSystem/NVMS/Technical-Documents>

## 2. Installation Environment

This chapter describes the points to note for installation to ensure you can continue using the unit for a long time.

### 2.1. Mounting in Rack

When installing the unit in a rack, use the specified rack mount kit and ensure that there is enough space between the rack and unit of at least 5 cm (2 in) on both the right and left sides and at least 10 cm (4 in) at the top and rear.

Leave a space equivalent to at least the 1U rack mount size at the top and bottom of the unit.

Furthermore, the temperature inside the rack needs to be within the operating temperature range of the unit.

In addition to securing space between the rack and the unit to prevent blocking of air flow, reduce the temperature inside the rack by installing a fan or like, if necessary, considering the amount of heat generated by the unit.

For details on the specified rack mount kit, see the NVMS Enterprise Edition Compatible Peripherals List.

### 2.2. Installing on Desktop

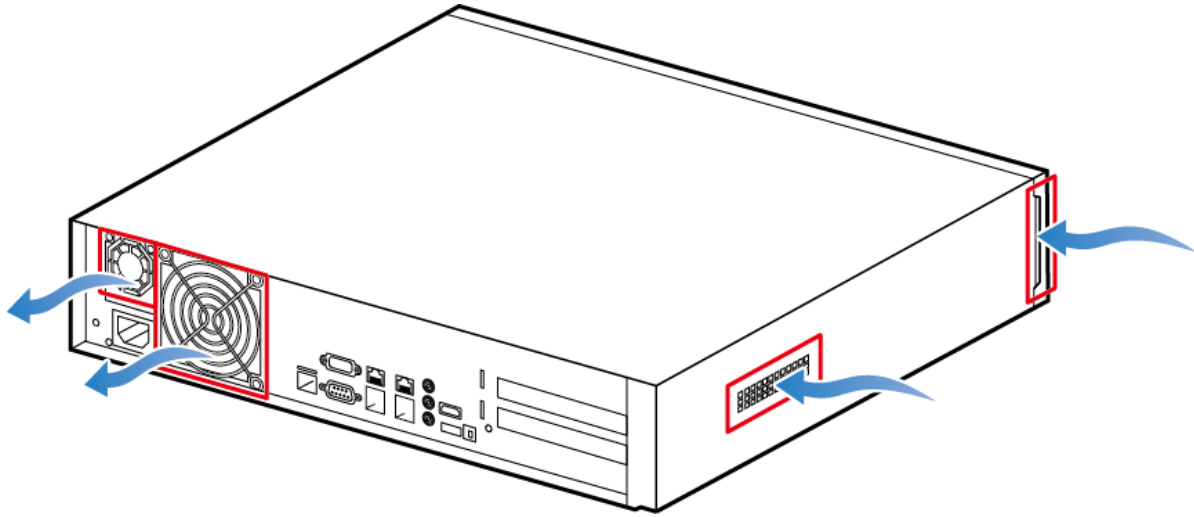
When installing the unit on a desktop or other flat surface, install it in a horizontal stable location and ensure that there is enough space of at least 5 cm (2 in) on both the right and left sides and at least 10 cm (4 in) at the top and rear.

There are ventilation holes at the bottom of the front panel so be sure to attach the supplied rubber feet.

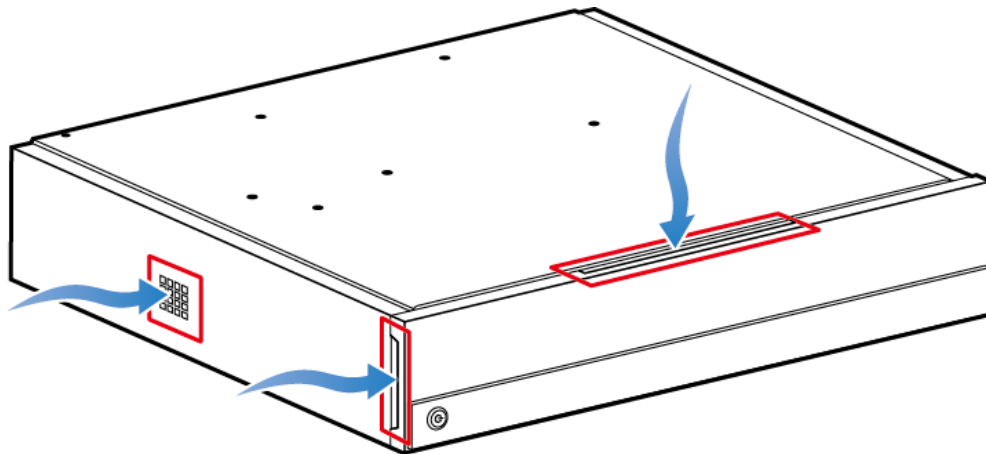
## 2.3. Air Flow

When installing the unit, make sure NOT to block the air flow.

[Top, rear, and left side]



[Bottom, front, and right side]



## 2.4. Operating Temperature

In general, when the ambient temperature becomes high, this tends to have an influence on the life of HDDs because their characteristics deteriorate.

There will be no problem if the unit is used within the operating temperature range, but Sony recommends the operation at an ambient temperature of 25 °C (77 °F) or less to ensure the HDDs can continue to be used for as long as possible.

## 3. Specifications

### 3.1. Power Consumption

The following reference data is for calculating the required power supply capacity, amount of heat generated, etc. for installing the unit.

#### Use Case 1

	HDD
Platform Condition	4TB HDD x1

Input Voltage [V]	Frequency [Hz]	Standby Mode [A]	Full Loading [A]	Inrush Loading [A]
100	50	0.123	0.587	25.4
120	60	0.132	0.497	25.4
220	50	0.145	0.342	16
240	50	0.145	0.313	16

#### Use Case 2

	HDD
Platform Condition	4TB HDD x2

Input Voltage [V]	Frequency [Hz]	Standby Mode [A]	Full Loading [A]	Inrush Loading [A]
100	50	0.123	0.685	25.4
120	60	0.132	0.576	25.4
220	50	0.145	0.377	16
240	50	0.145	0.346	16

#### Use Case 3

	HDD
Platform Condition	4TB HDD x4

Input Voltage [V]	Frequency [Hz]	Standby Mode [A]	Full Loading [A]	Inrush Loading [A]
100	50	0.123	0.877	25.4
120	60	0.132	0.723	25.4
220	50	0.145	0.418	16
240	50	0.145	0.397	16

Use Case 4

	HDD
Platform Condition	4TB HDD x6

Input Voltage [V]	Frequency [Hz]	Standby Mode [A]	Full Loading [A]	Inrush Loading [A]
100	50	0.123	1.076	25.4
120	60	0.132	0.894	25.4
220	50	0.145	0.516	16
240	50	0.145	0.479	16

Use Case 5

	HDD
Platform Condition	4TB HDD x8

Input Voltage [V]	Frequency [Hz]	Standby Mode [A]	Full Loading [A]	Inrush Loading [A]
100	50	0.123	1.271	25.4
120	60	0.132	1.053	25.4
220	50	0.145	0.586	16
240	50	0.145	0.545	16

## 3.2. Environment

Operating temperature

5 °C to 40 °C (41 °F to 104 °F)

Operating humidity

20% to 80% (no condensation)

Temperature range for storage

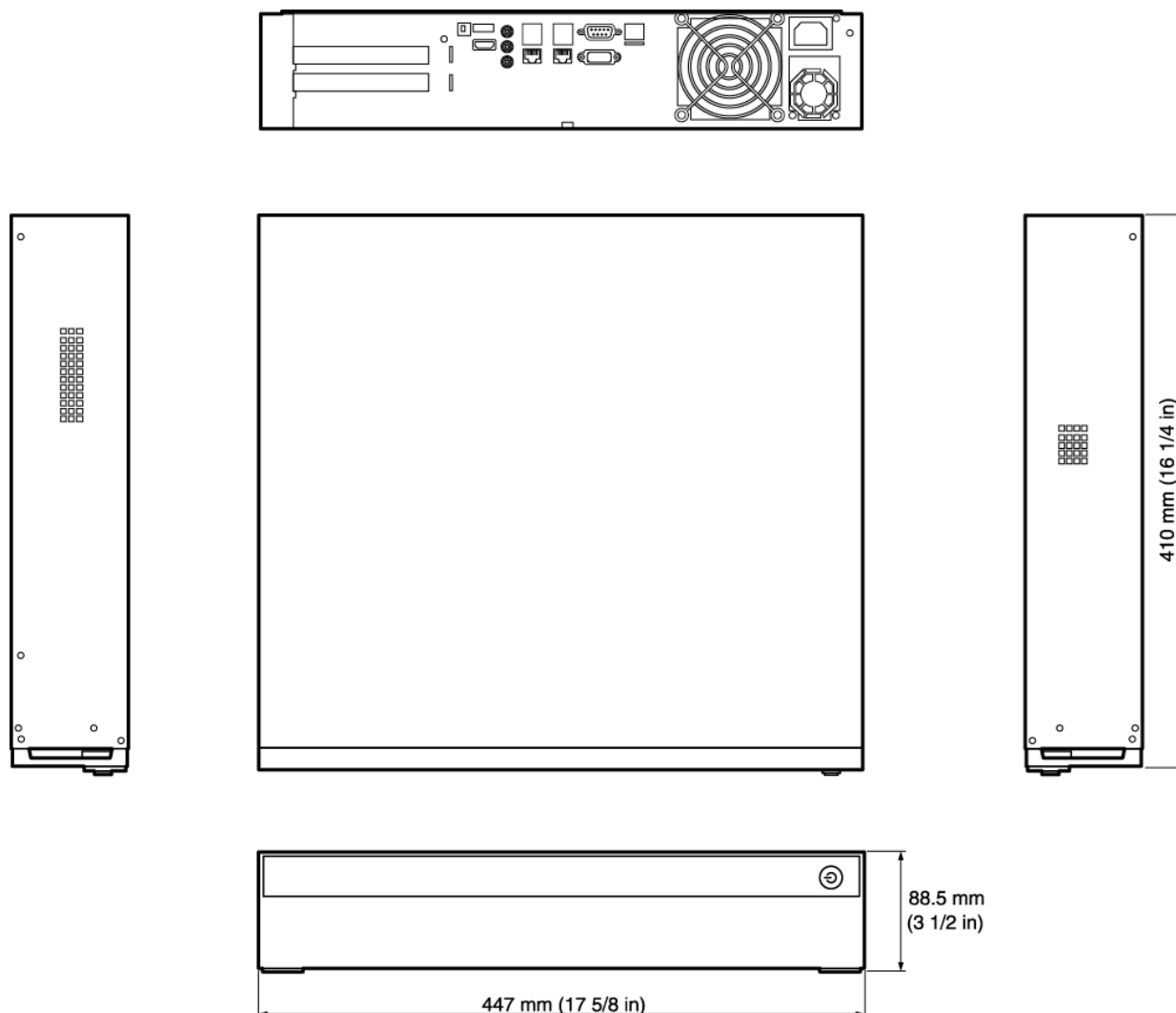
−20 °C to +60 °C (−4 °F to +140 °F)

Humidity range for storage

20% to 90% (no condensation)



### 3.3. External Dimensions



If the CAD data (dxf and stp) is required, contact your dealer.

### 3.4. Noise Characteristics

The unit is expected to be installed in a server room or other location away from the operator. Consider the noise of the fan when selecting the installation location.

When the ambient temperature becomes high, the rotation speed of the fan increases resulting in a higher level of noise.

### 3.5. Clock Accuracy

The accuracy of the clock of the unit is about  $\pm 60$  seconds per month so Sony recommends using NTP.

### 3.6. Caution

When this unit will be used, please also note the following points.

- A high-availability system cannot be built with this product.
- The internal processing load will become high during a rebuild processing after replacing a failed hard disk so a deterioration in performance, such as some frames not being recorded, may occur. Sony recommends performing a system evaluation in advance.
- A deterioration in performance, such as some frames not being recorded, may occur as a result of degradation of an HDD. When operating at room temperature, a normal replacement cycle will be about two to three years. However, this replacement cycle represents only a general guideline and does not imply that the life expectancy of these parts is guaranteed. For details on parts replacement, contact your dealer.

## 4. Storage Design

Recording and archiving must be set as recording storage of each camera. This chapter describes how to build and how to calculate the recording storage for recording and archiving.

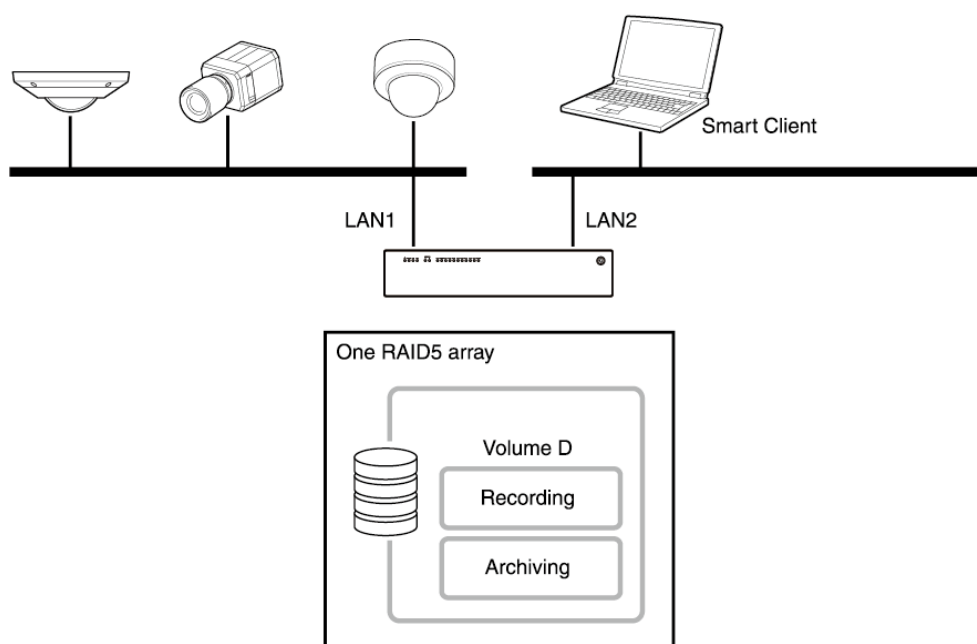
**Note:**

- For a detailed explanation on recording and archiving, see the NVMS Enterprise Edition Administration Manual.
- RAID5 or RAID5 + hot spare is recommended for the RAID level. The level is presumed to be RAID5 in the explanations in this document.

## 4.1. Volume Design

This section describes how to design the volumes for recording and archiving.

### 4.1.1. When Not Using External Storage

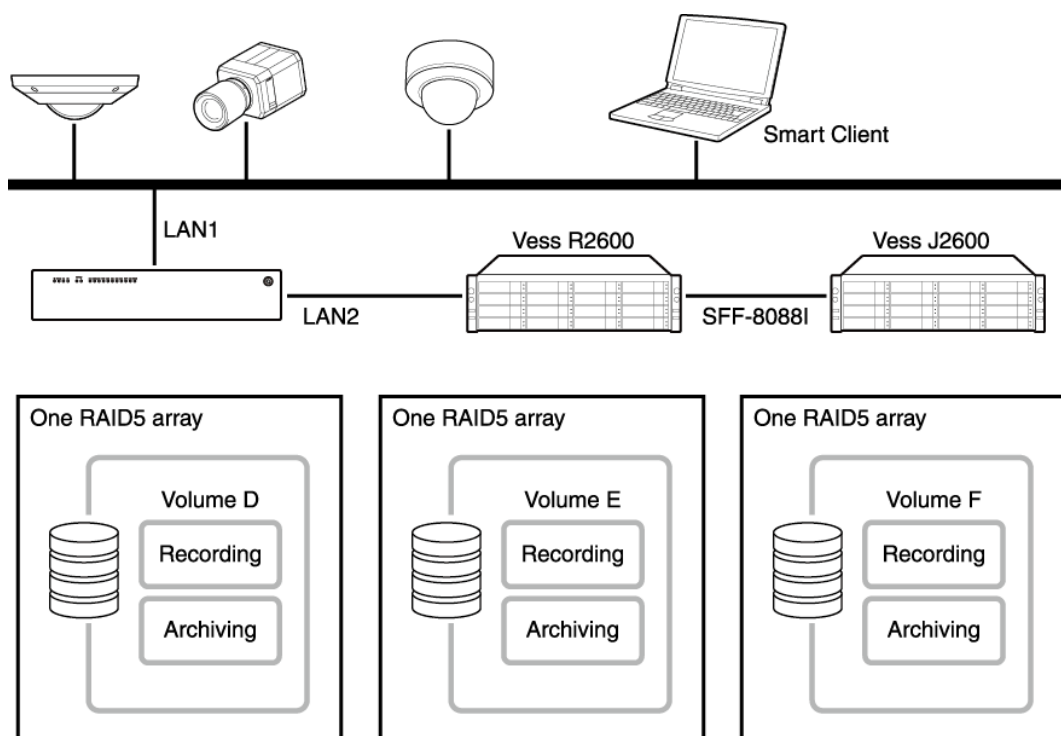


When operation will be performed with one Network Video Recorder, build one RAID array using the entire inserted HDDs and then create one volume on it. Set recording and archiving in this one volume.

#### Note:

- For how to build a RAID array, how to create a volume, and how to set recording and archiving, see the NVMS Enterprise Edition Installation Manual.
- If the power supply is interrupted while the unit is in operation, data may be damaged. Be sure to take measures against power outages to protect data.

### 4.1.2. When Using External Storage



When operation will be performed with multiple external storage units connected to one Network Video Recorder, for each of the units, build one RAID array using the entire inserted HDDs and create one volume on it. Set recording and archiving in this one volume.

Furthermore, design this so that the recording and archiving locations are in the same unit for each camera. In other words, if the recording of a certain camera is set to volume D, be sure to set the archiving of that camera to volume D as well.

#### Note:

- For how to build a RAID array, how to create a volume, and how to set recording and archiving, see the NVMS Enterprise Edition Installation Manual.
- The above figure uses the external storage units of Promise Technology, Inc. as an example. Use the designated product for external storage. For details, see the NVMS Enterprise Edition Compatible Peripherals List.
- If the power supply is interrupted while the unit is in operation, data may be damaged. Be sure to take measures against power outages to protect data.

## 4.2. How to Calculate Storage Capacity

This section describes how to calculate the storage capacity for recording and archiving.

### Note:

- A sheet for calculating the necessary storage capacity based on the calculation method described in this section is provided on the Web. Please download it from the following URL and then use it.

NVMS Storage Calculator

<https://www.sony.net/CameraSystem/NVMS/Technical-Documents>

### 4.2.1. How to Calculate Capacity for Recording

Sony recommends moving the data from recording to archiving every one hour. In this case, the calculation method for recording is as follows.

$$(M \times N \times 1.1 \times 2 \times 60 \times 60) / 8 / (1024 \times 1024) = \text{Recording capacity [TB]}$$

M: Number of cameras

N: Bitrate [Mbps]

1.1: 10% overhead

2: Previous + current hour

### 4.2.2. How to Calculate Capacity for Archiving

With regard to the capacity required for archiving, Sony recommends securing a capacity that allows recording data for a number of days equaling the number of days you wish to record plus one extra day. Specifically, work out the capacity required for archiving with the following equation.

$$(M \times N \times 24 \times 60 \times 60) \times (D + 1) / 8 / (1024 \times 1024) = \text{Archiving capacity [TB]}$$

M: Number of cameras

N: Bitrate [Mbps]

D: Retention time [days]

## 5. Recommendations for Better Security

To help secure your surveillance system, Sony recommends the following:

- Restrict access to servers. Keep servers in locked rooms, and make it difficult for intruders to gain access to the network and power cables.
- Design a network infrastructure that uses physical network or VLAN segmentation as much as possible:
  - Separate the camera network from the server network by having two network interfaces in each recording server. One for the camera network, and one for the server network.
  - Put the mobile server in a “demilitarized zone” (DMZ) with one network interface for public access, and one for private communication to other servers.
  - Many precautions can be taken when it comes to general set up. In addition to firewalls, these include techniques to segment the network and control access to the servers, clients, and applications.
- Configure the Network Video Recorder with roles that control access to the system, and designate tasks and responsibilities.

### 5.1. Following Microsoft OS Security Best Practices

When installing components other than a recording server on a PC other than this unit, Sony recommends that you follow the security best practices for Microsoft operating systems (OS) to mitigate OS risks and maintain security. This will help you keep the Microsoft servers and client computers secure.

For more information, see “Microsoft Security Update Guide,” which is available here: <https://technet.microsoft.com/en-us/security/dn550891.aspx>

### 5.2. Using Firewall between Network Video Recorder and Internet

The Network Video Recorder should not connect directly to the Internet. If you expose parts of the Network Video Recorder to the Internet, Sony recommends that you use an appropriately configured firewall between the Network Video Recorder and the Internet. If possible, expose only the NVMS Mobile server component to the Internet, and locate it in a demilitarize zone (DMZ) with firewalls on both sides.

### 5.3. Precautions for Installing NVMS Mobile Server on Unit

The Padding Oracle On Downgraded Legacy Encryption (POODLE) vulnerability exists in SSL3.0 pre-installed on this unit. When the NVMS Mobile server is installed on the unit, there is a risk of a user name and password being leaked if SSL3.0 is used when the access is via HTTPS. Therefore, Sony recommends taking the following measures when the NVMS Mobile server is installed on the unit.

#### 5.3.1. Settings on Server

On the server side, change the settings of Windows to disable SSL3.0. For details on the settings, see the following. However, since there is a possibility that the recording performance may be affected, Sony recommends performing sufficient operation testing prior to the actual operation.

<https://technet.microsoft.com/en-us/library/security/dn818467.aspx>

#### 5.3.2. Settings on Client

When connecting to the Mobile server with a Web Client, disable SSL3.0 in the settings of the Web browser on the Web Client and set connections to be made using a protocol other than SSL3.0. For details on the settings, see the following.

<https://technet.microsoft.com/en-us/library/security/dn818467.aspx>



## Revision History

Date	Revision	Description
2016/11/18	1.0.0	First edition.

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