NSFOCUS ADS-M-KVM
Installation and Deployment Guide

Version: V4.5R90F04 (2022-10-14)

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Contents

Preface

Scope

This document briefly describes NSFOCUS Virtualized Anti-DDoS System Management (ADS-M-KVM) and details how to deploy and install it.

Currently, an ADS M virtual machine supports both the VMware Workstation and Kernel-based Virtual Machine (KVM) platforms. This document describes how to install and deploy the ADS M virtual machine on the KVM platform. Users of other host machine types should perform configuration by referring to other related documents.

This document is provided for reference only. It may slightly differ from the actual product due to version upgrade of the virtual platform or other reasons.

Audience

This document is intended for the following users:

- Users who wish to manage NSFOCUS ADS or detect abnormal traffic by using ADS-M-KVM
- Users who wish to know main features and usage of this product
- System administrator
- Network administrator

This document assumes that you have knowledge in the following areas:

- Virtualization
- Network security
- Linux and Windows operating systems
- TCP/IP protocols
- KVM
- NSFOCUS Anti-DDoS System Management (ADS M)

Organization

Chapter	Description
1 Basic Information	Describes requirements for configuring host machines and virtual hosts of ADS-M-KVM.
2 Deployment	Describes how to import and configure ADS-M-KVM.

Chapter	Description
A Default Parameters	Describes default parameters of ADS-M-KVM.

Change History

Version	Description
V4.5R90F04	Updated the structure based on the new template.

Terminology

Term	Description
Host machine	Physical machine or server that provides the virtual platform (KVM).
Guest machine	Virtual machine hosted on the virtual platform. In this document, ADS-M-KVM is a guest machine on KVM.

Conventions

Convention	Description
Bold font	Keywords, names of screen elements like buttons, drop-down lists or fields, and user-entered text appear in bold font.
Italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in italic font.
Note	Reminds users to take note.
Tip	Indicates a tip to make your operations easier.
Caution	Indicates a situation in which you might perform an action that could result in equipment damage or loss of data.
Warning	Indicates a situation in which you might perform an action that could result in bodily injury.
A > B	Indicates selection of menu options.

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Documentation Feedback

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1 Basic Information

This document describes requirements for configuring the host machine and virtual machine of ADS-M-KVM.

Section	Description
Host Machine Configuration Requirements	Describes configuration requirements of the host machine.
VM Configuration Requirements	Describes configuration requirements of the virtual machine.

1.1 Host Machine Configuration Requirements

ADS-M-KVM should be running on a host machine with the virtual machine (VM) software installed. Make sure that the host machine meets all requirements listed in Table 1-1.

Table 1-1 Reference configuration of the host machine

Item	Reference Configuration
CPU	Intel(R) Xeon(R) CPU E5-2680V2@2.8.0GHz
Memory	32 GB (at least 16 GB)
Hard disk	2 TB or larger
Network adapter	6 (at least 1)

Note	Running multiple VMs on the host machine will degrade the performance of ADS-M-KVM. Therefore, you are advised to shut down unused VMs. If the host configuration is below the default configuration requirements of the virtual machine, ADS-M-KVM will fail to perform as expected. Therefore, to make ADS-M-KVM work to the best effect, you should use a host whose hardware configurations match the default configuration requirements of the virtual machine.

1.2 VM Configuration Requirements

Table 1-1 lists configuration requirements of the VM.

Table 1-1 VM configuration requirements

Item	Reference Configuration
vCPU (total number of processor cores)	8
Memory (min)	16 GB
Storage (min)	2 TB
KVM version	QEMU KVM 1.5.3

2 Deployment

This chapter describes how to import ADS-M-KVM to the virtual platform and details how to configure related settings for it.

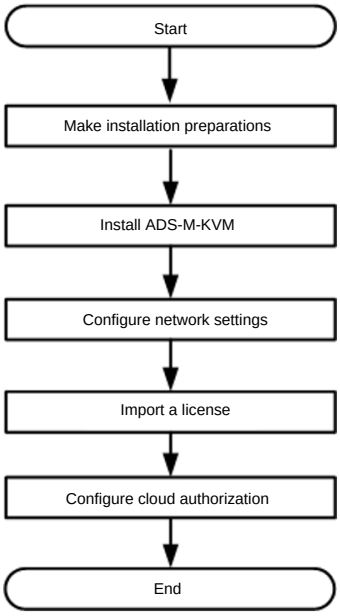
This chapter contains the following sections:

Section	Description
Deployment Flowchart	Describes how to deploy ADS-M-KVM.
Preparations	Describes preparations to be made for installing ADS-M-KVM.
Installing ADS-M-KVM	Describes how to install ADS-M-KVM.
Configuring Network Settings	Describes how to complete initial configurations of ADS-M-KVM.
Importing a License	Describes how to import a license of ADS-M-KVM.
Configuring Cloud Authorization	Describes how to configure cloud authorization.

2.1 Deployment Flowchart

Figure 2-1 shows the ADS-M-KVM deployment flowchart.

Figure 2-1 ADS-M-KVM deployment flowchart



2.2 Preparations

Before installing ADS-M-KVM locally, you must prepare the items listed in Table 2-1.

Table 2-1 List of items to be prepared for installing ADS-M-KVM locally

Item		Description
Host	IP address	Make sure that the host can properly connect to the network.
	Account	This account must have privileges of a system administrator.
	Network interface	At least one 1000M interface is available.
	Operating system (OS)	CentOS 7 is recommended.
ADS-M-KVM	ADS-M-KVM image file	This file needs to contain ADSM1.img, ADSM2.img, and ADSM.xml.
	IP address	IP address of the management interface of ADS-M-KVM.

2.2.1 Installing and Configuring the Host System

To install and configure the host system, follow these steps:

Step 1 Install CentOS 7.

For details about the installation process, visit https://docs.centos.org/en-US/centos/install-guide/.

Step 2 Install some basic tools.

Run the following command to install some tools for the subsequent use of certain networks:

```
yum -y install net-tools
```

----End

2.2.2 Installing KVM

To install KVM, follow these steps:

Step 1 Install KVM with root privileges over the network.

```
yum install kvm  virt-viewer virt-manager libvirt libvirt-python libvirt-client
qemu-kvm qemu-img bridge-utils -y
```

Step 2 Start KVM.

```
systemctl start libvirtd      #starts KVM.
systemctl enable libvirtd    #configures KVM to start upon system boot.
```

----End

2.2.3 Configuring the Network Bridge Settings

2.2.3.1 Configuration Requirements

Create a bridge interface. By default, ADS-M-KVM's management interface uses the bridge NIC br0.

For details on configuration commands and parameters, visit the following link:

https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/7/html/networking_guide/sec-network_bridging_using_the_command_line_interface

2.2.3.2 Configuration Example

Create a bridge interface br0 on the Ethernet interface em3 and set the IP address of this bridge interface.

Step 1 Perform network configurations.

/etc/sysconfig/network-scripts/ifcfg-em3 interface configuration file example:

```
DEVICE="em3"
ONBOOT=yes
BRIDGE="br0"
```

/etc/sysconfig/network-scripts/ifcfg-br0 interface configuration file example:

```
IPADDR="192.168.1.100"
NETMASK="255.255.255.0"
GATEWAY="192.168.1.254"
DEVICE="br0"
ONBOOT="yes"
BOOTPROTO="none"
STP="on"
DELAY="0"
TYPE="Bridge"
```

Note	• The interface em3 should be changed to the actual interface of the server. • The host information including IPADDR, NETMASK, and GATEWAY should be configured according to the actual network deployment scenario.

Step 2 Restart the network.

```
systemctl restart network
```

Step 3 Query the bridge interface.

```
brctl show
#-----The command output is as follows:--------
bridge name    bridge id            STP enabled    interfaces
br0           8000.246e9660c50c      yes           em3
```

----End

2.2.4 Virtualization

2.2.4.1 Process of Enabling Virtualization

To enable virtualization, follow these steps:

Step 1 Reboot the computer and open the system's BIOS menu.

This can be done by pressing **Delete**, **F1**, or **Alt+F4**, depending on the operating system you use.

Step 2 Enable virtualization extensions in BIOS.

a. Open the **Processor** submenu. The processor settings menu may be hidden in the **Chipset**, **Advanced CPU Configuration**, or **North Bridge** tabs.

b. Enable **Intel Virtualization Technology** (also known as Intel VT-X). AMD-V extensions cannot be disabled in the BIOS and should already be enabled. The virtualization extensions may be labeled **Virtualization Extensions**, **Vanderpool** or various other names, depending on the OEM and system BIOS.

c. Enable **Intel VTd** or **AMD IOMMU**, if these options are available. They are used for PCI passthrough assignment to the ADS-M-KVM.

d. Select **Save & Exit**.

Note	The preceding configurations may vary with your motherboard, processor type, chipset, and OEM. For how to correctly configure your system, see your system's accompanying documentation.

Step 3 Restart the computer.

Step 4 Check whether virtualization is enabled.

Run the following command to check whether CPU virtualization extensions are available. If there is no command output, the system may not have virtualization extensions. You need to check and modify BIOS settings accordingly.

```
grep -e "vmx svm" /proc/cpuinfo
```

Run the following command to check whether virtualization extensions are available. If there is no command output, the system may not have virtualization extensions and device passthrough assignment cannot be done. If passthrough assignment of NICs is required, you need to check and modify BIOS settings.

```
ls /sys/kernel/iommu_groups/
```

Step 5 Configure the GRUB on the host to enable NIC passthrough.

Edit **/etc/default/grub** by adding the following line:

```
GRUB_CMDLINE_LINUX_DEFAULT=" intel_iommu=on";
```

a. Run the following command to modify the system GRUB.

```
grub2-mkconfig -o $(find / -name grub.cfg | head -1)
```

b. Restart the host (or do this after the CPU isolation configuration is completed)

----End

2.2.4.2 Virtualization Enabling Example

The following is an example of enabling virtualization:

Step 1 Enable CPU virtualization (Intel Virtualization), as shown in Figure 2-1 and Figure 2-2.

Figure 2-2 Enabling CPU virtualization 1

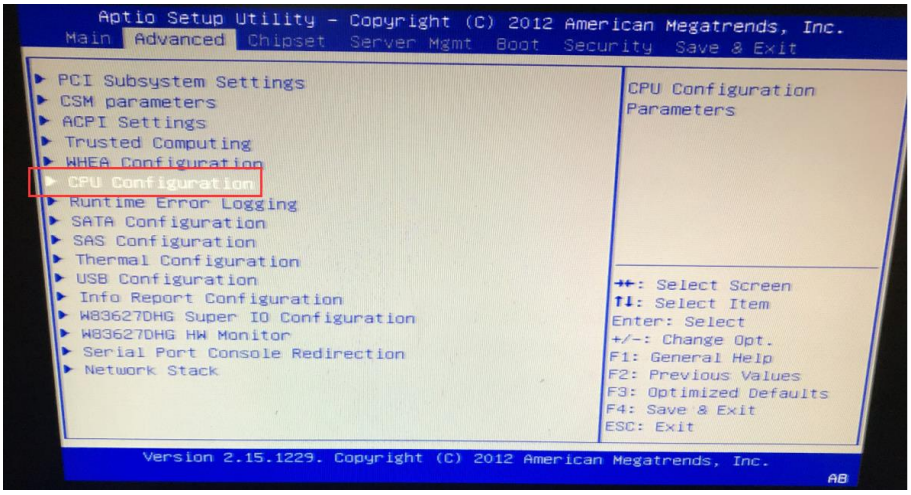
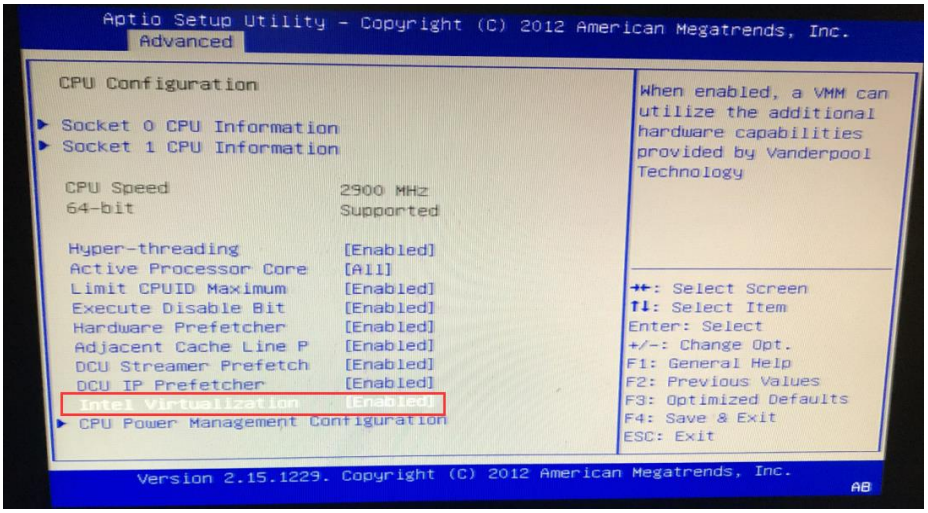


Figure 2-3 Enabling CPU virtualization 2



Step 2 Enable IOMMU support (Intel(R) VT-d) in the BIOS.

Figure 2-4 Enabling IOMMU support (Intel(R) VT-d)1 in BIOS

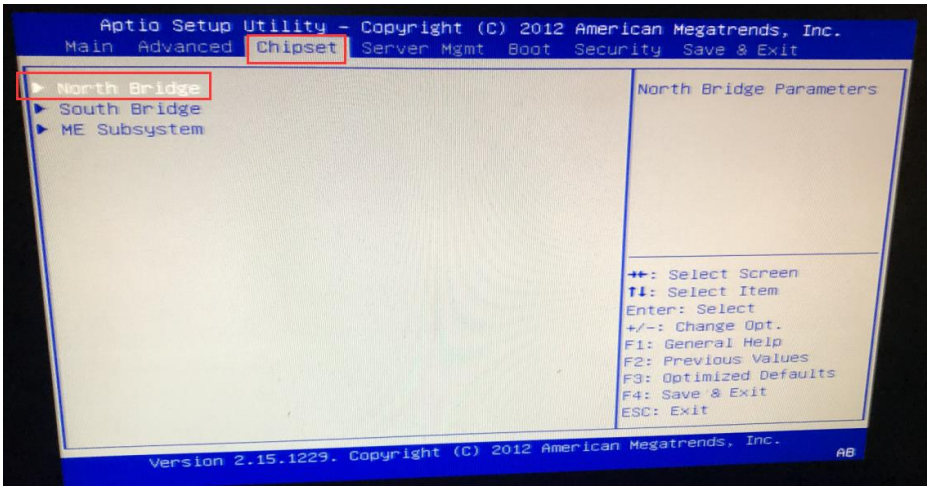


Figure 2-5 Enabling IOMMU support (Intel(R) VT-d)2 in BIOS

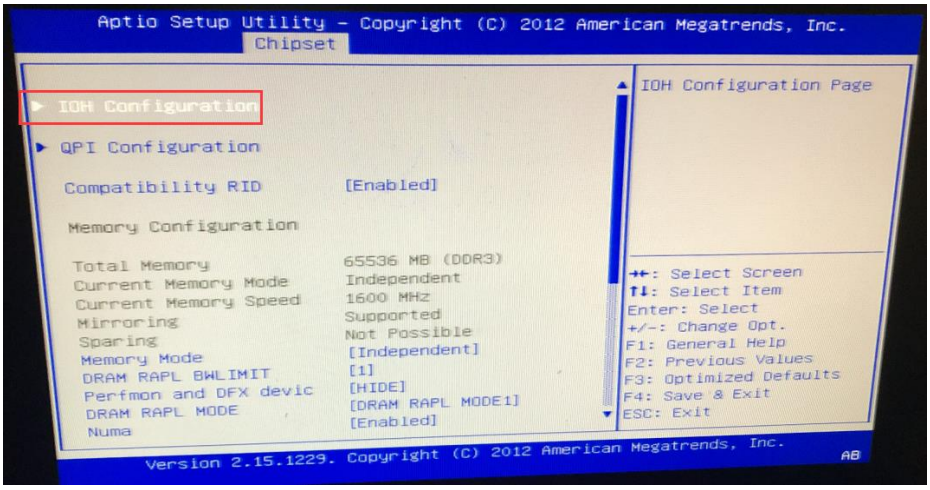


Figure 2-6 Enabling IOMMU support (Intel(R) VT-d)3 in BIOS

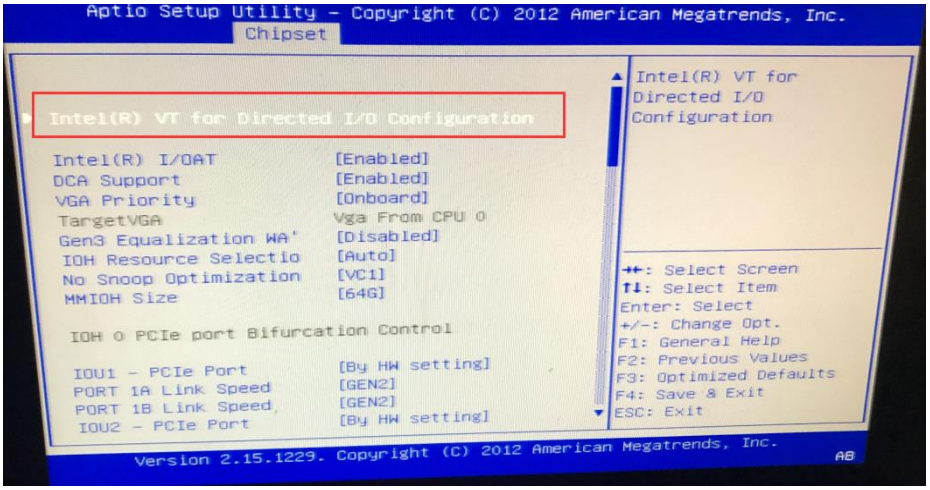
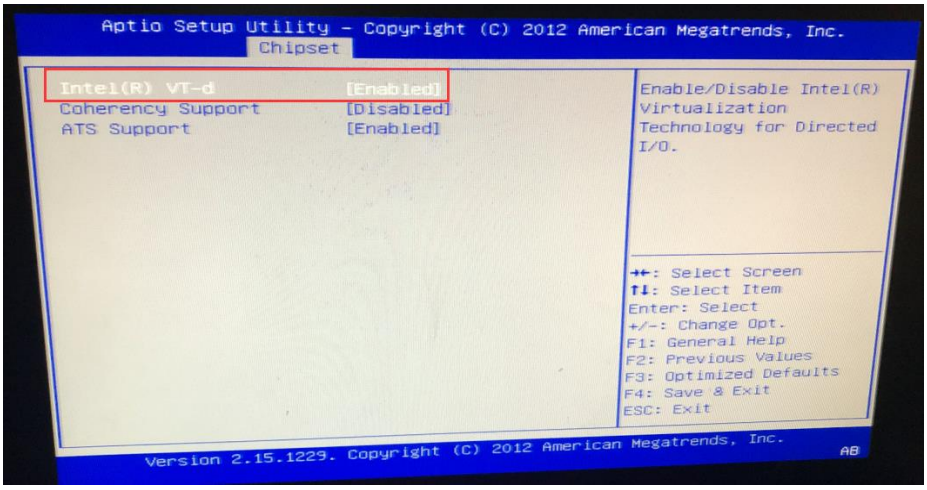
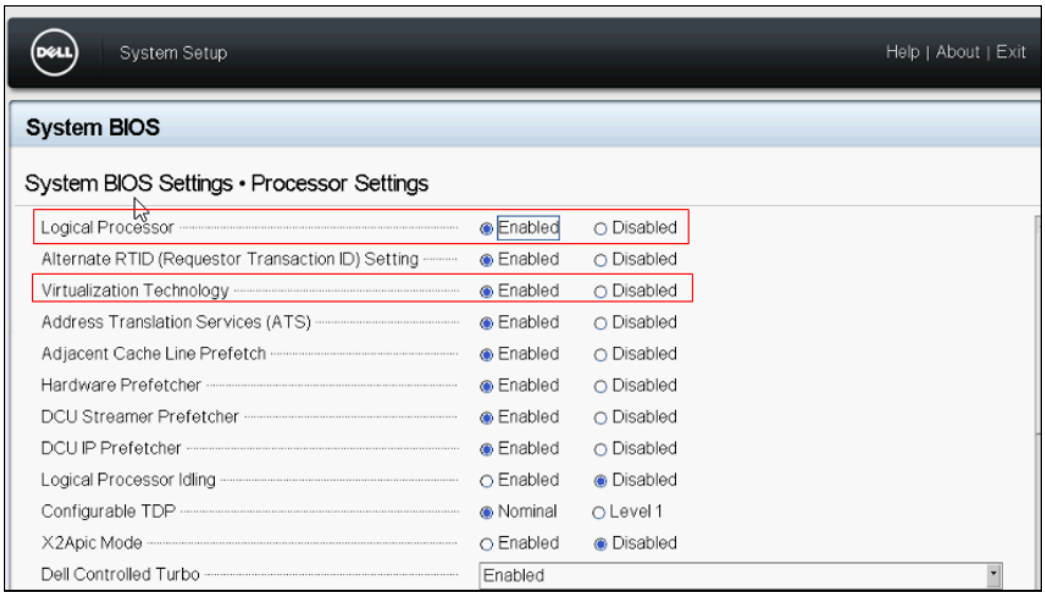


Figure 2-7 Enabling IOMMU support (Intel(R) VT-d)4 in BIOS



Step 3 Choose **Bios** > **Processor Settings** > **Virtualization Technology** and set Dell R730 BIOS parameters.

Figure 2-8 Setting Dell R730 BIOS parameters



----End

2.3 Installing ADS-M-KVM

Note	The following operations are command executions and file editings done on the Linux terminal on the host.

2.3.1 Deploying an Image

Before deploying an image, you need to obtain the ADS-M-KVM image which contains three files: **ADSM1.img**, **ADSM2.img**, and **ADSM.xml**.

To deploy an image, follow these steps:

Step 1 Log in to the terminal of the host and define the **/home/vadsm** directory.

```
mkdir -p /home/vadsm
```

Step 2 Put the ADS-M-KVM image file in the **/home/vadsm** directory.

----End

2.3.2 Assigning NICs

Currently, ADS-M-KVM supports virtual NICs. If a virtual NIC is used, the host needs to send packets to ADS-M-KVM.

2.3.2.1 Virtual NIC Assignment for the Management Interface

For the sake of more efficient packet forwarding, the NIC assigned to ADS-M-KVM cannot be used by the host. It is recommended that an independent NIC in passthrough mode be used as the management interface of ADS-M-KVM so that the virtual machine can deliver better performance.

To assign a physical NIC in passthrough mode to ADS-M-KVM, follow these steps:

Step 1 Modify the configuration file of ADS-M-KVM.

```
virsh edit ADSM
```

Step 2 Add a virtual NIC. Note that **em4** shown in the following script should be replaced by the name of the NIC assigned to ADS-M-KVM.

```
<interface type='direct' trustGuestRxFilters='yes'>
  <mac address='00:0c:29:3c:33:dd'/>
 <source dev='em4' mode='passthrough'/>
 <model type='e1000'/>
</interface>
```

Notes:

1. If the host has only one NIC, the management interface of the host and that of ADS-M-KVM can be configured to work in bridge mode. However, a better way is still to configure a separate management interface NIC in passthrough mode for ADS-M-KVM.

   Following are reference settings for configuring the bridge mode for ADS-M-KVM:

```
<interface type='bridge'>
```

```
    <mac address='52:54:00:06:99:1f'/>
    <source bridge='br0'/>
    <model type='e1000'/>
  </interface>
```

2. The MAC address in the preceding script represents the MAC address of a NIC on the host.

----End

2.3.2.2 Virtual NIC Assignment for Other Interfaces

Virtual NICs are assigned to other interfaces (like working interfaces) in the same way as they are assigned to the management interface.

To assign a physical NIC to ADS-M-KVM, follow these steps:

Step 1 Modify the configuration file of ADS-M-KVM:

```
virsh edit ADSM
```

Step 2 Add a virtual NIC. Note that **em4** shown in the following script should be replaced by the name of the NIC assigned to ADS-M-KVM.

```
  <interface type='direct' trustGuestRxFilters='yes'>
    <source dev='em4' mode='passthrough'/>
    <model type='virtio'/>
    <driver name='vhost' queues='8'/>
  </interface>
```

----End

2.3.3 Enabling ADS-M-KVM

To enable ADS-M-KVM, follow these steps:

Step 1 Run the following command to import ADS-M-KVM.

```
virsh define /home/vadsm/ADSM.xml
```

Step 2 Start ADS-M-KVM.

```
virsh start ADSM
```

Step 3 Run the following command on the host to connect to the console of ADS-M-KVM.

```
virsh console ADSM --force
```

Step 4 Log in to ADS-M-KVM as user **admin**.

----End

2.4 Configuring Network Settings

After logging in, configure network settings by referring to the description of console-based management in the *NSFOCUS ADS M User Guide*.

Step 1 Configure parameters.

a. Select **Network** under **Display system status setup**.

b. Select **Add an address**.

c. Select **inet** (indicating IPv4 address) or **inet6** (indicating IPv6 address). Here **inet** is selected.

d. Select a network adapter. Here **eth0**, the first virtual network adapter, is selected.

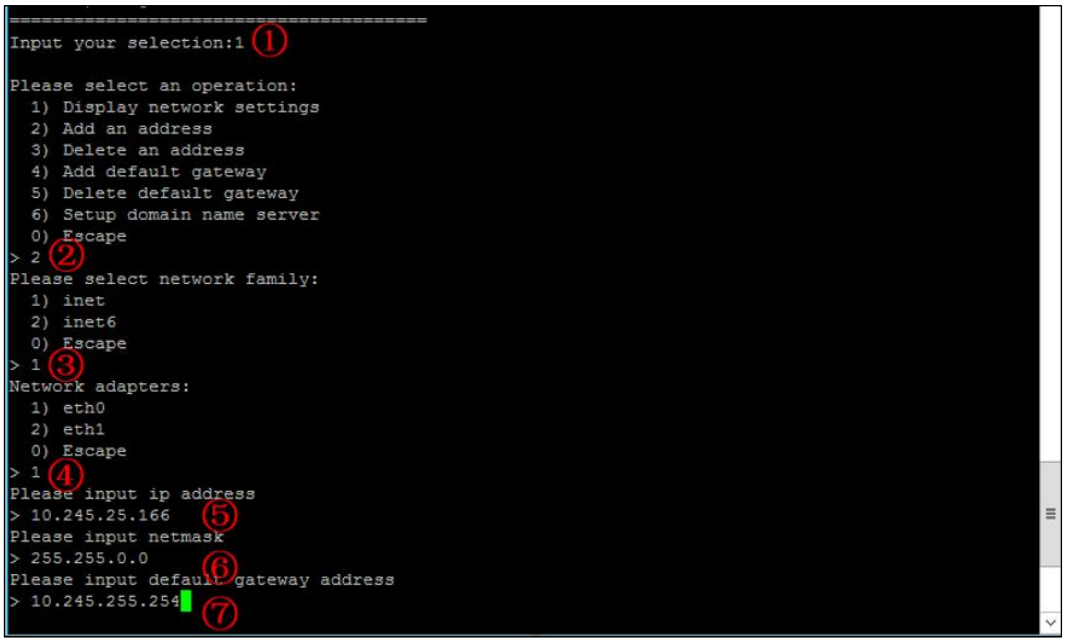
e. Type a correct IP address.

f. Type a correct netmask.

g. Type a correct default gateway.

Figure 2-9 shows the window in which network settings have been configured.

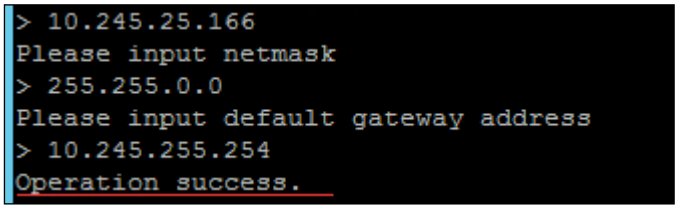
Figure 2-9 Configuring network settings



Step 2 Press **Enter** to confirm the configuration.

The system then prompts "Operation success", as shown in Figure 2-10.

Figure 2-10 Operation success message



----End

2.5 Importing a License

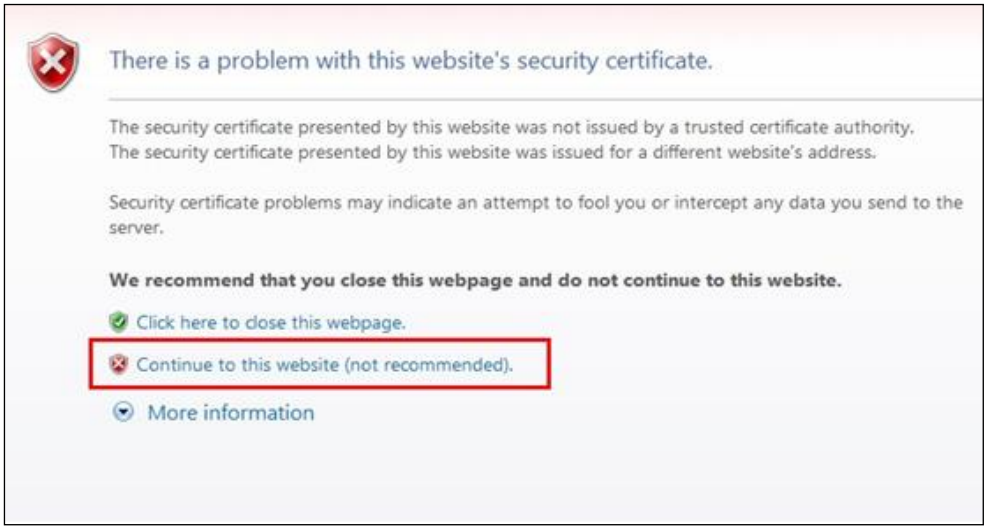
After logging in to the web-based manager of ADS-M-KVM, you must import a valid license for using it.

To import a license, follow these steps:

Step 1 Open a browser (Internet Explorer is used here) and access ADS-M-KVM in HTTPS mode by typing the server IP address, such as **https://192.168.1.100**, and pressing **Enter**.

A security alert page appears, as shown in Figure 2-11.

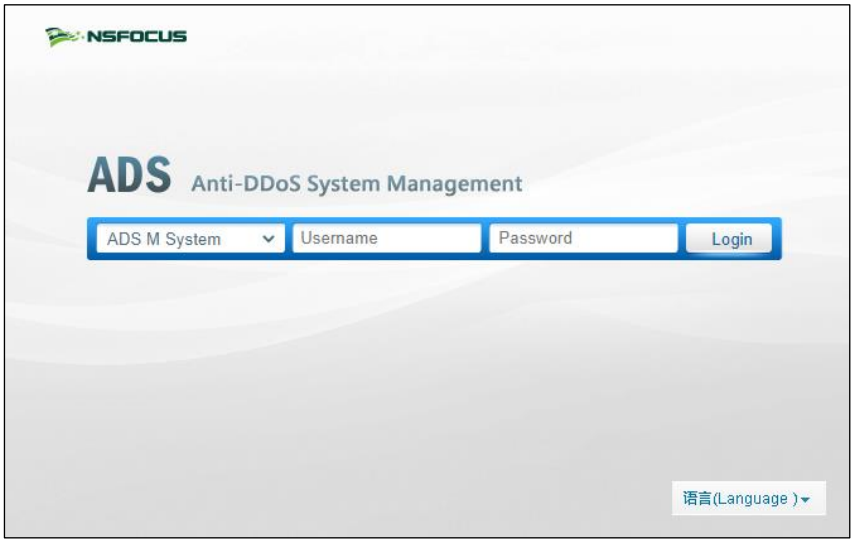
Figure 2-11 Security alert



Step 2 Click **Continue to this website (not recommended)** to accept the channel secured by the ADS-M-KVM certificate.

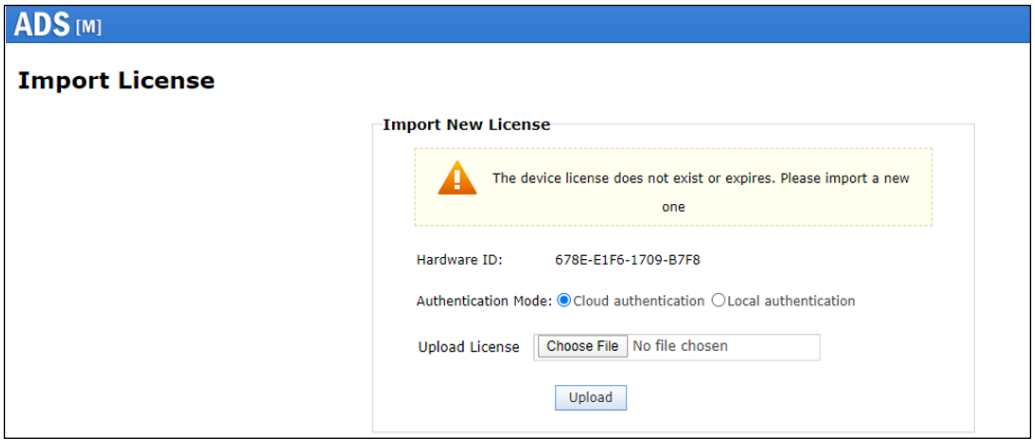
The login page shown in Figure 2-12 appears.

Figure 2-12 Login page



Step 3 Type a valid user name and password and click **Login** or press **Enter**. The system displays that the license does not exist or expires and shows a license import page.

Figure 2-13 Importing a license



Step 4 Check the hardware ID.

Send this hardware ID to NSFOCUS's sales or after-sales personnel, who will then produce an authorization license accordingly. After obtaining such a license, you can import it to ADS-M-KVM.

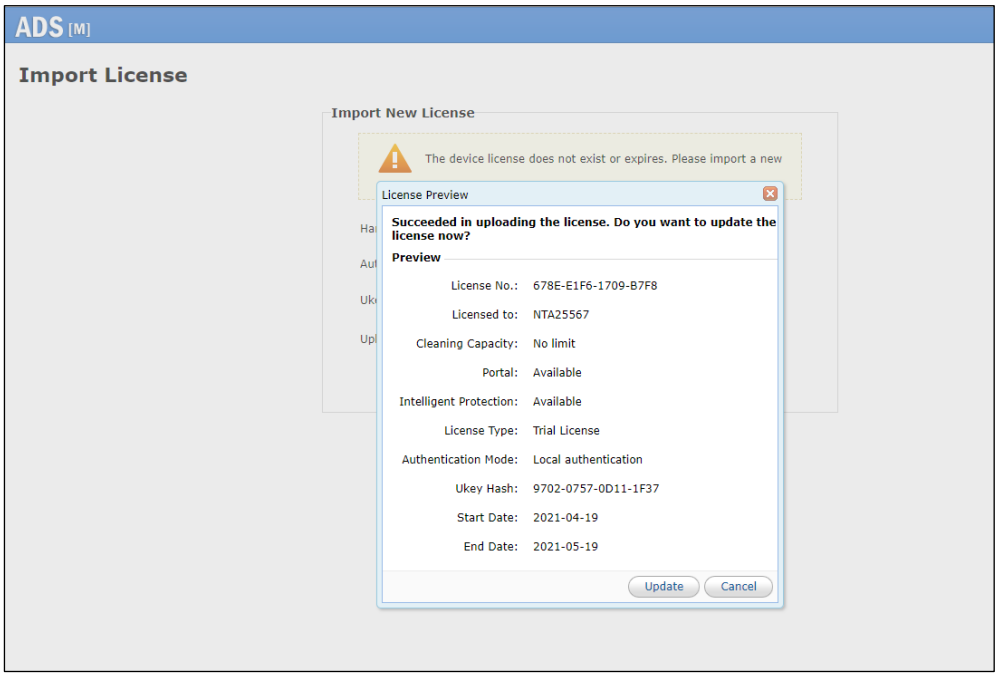
Step 5 Select the authentication mode.

You can select the cloud-based authentication or local authentication. The authentication mode, once specified, cannot be changed on the web-based manager (can be changed only when you restore factory defaults on the console).

Step 6 On the page shown in Figure 2-13, browse to the local license file and click **Upload**.

The license preview dialog box appears.

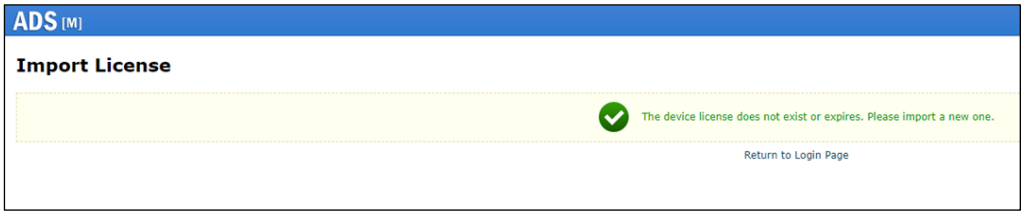
Figure 2-14 Previewing the license



Step 7 Click **Update** to import the license.

A message indicating an import success is displayed, as shown in Figure 2-15.

Figure 2-15 License import success



Step 8 Click **Back** to return to the login page. You can successfully log in to the web-based manager by typing the user name and password.

----End

2.6 Configuring Cloud Authorization

ADS-M-KVM can work properly only after being authorized locally or by the cloud.

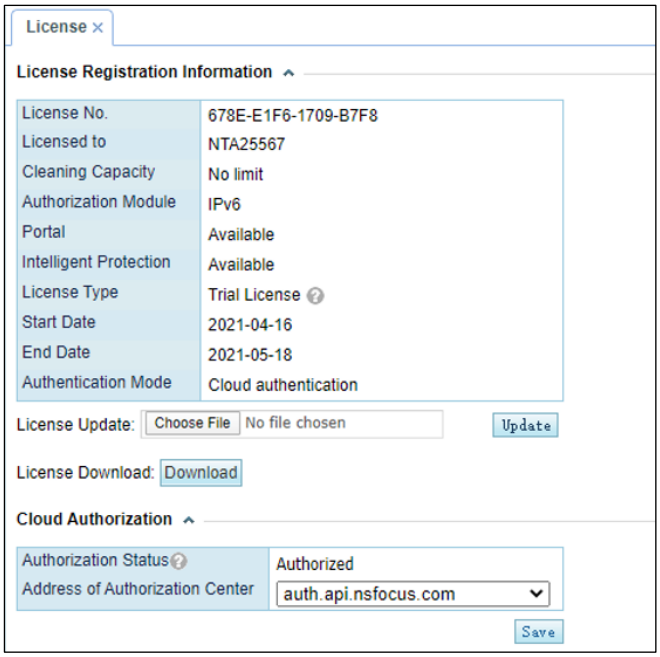
To obtain cloud-based authorization, follow these steps:

Step 1 On the web-based manager of ADS-M-KVM, choose **Administration** > **Local Settings** > **License**.

Step 2 Set **Address of Authorization Center** to the domain name of the authorization center.

Note	To obtain authorization, ADS-M- KVM must connect to the Internet. • For use on the Chinese mainland, choose **auth.api.nsfocus.com**. • For use in other countries and regions, choose **auth.nsfocusglobal.com**.

Figure 2-16 Configuring the address of the authorization center



Step 3 Click **Save** to complete the configuration.

----End

2.7 Configuring Local Authorization

ADS-M-KVM can work properly only after being authorized locally or by the cloud.

Prior to local authorization configuration, select **Local** for **Authorization** on the **Import License** page.

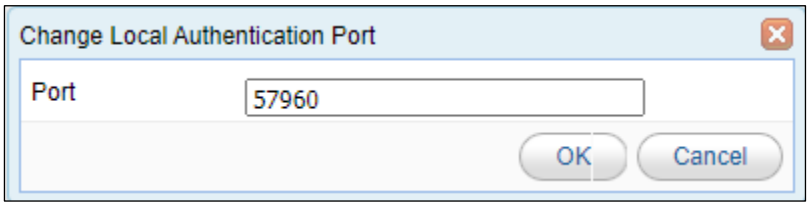
To configure local authorization, follow these steps:

Step 1 Choose **Administration** > **Local Settings** > **License**.

Step 2 Click to the right of **Port** to configure the port for local authentication.

Caution	Make sure that ADS M has the same local authentication port as ADS or NTA collaborating with it.

Figure 2-17 Configuring the local authentication port



Step 3 Click **Save** to commit the settings.

----End

A Default Parameters

A.1 Default Parameters of the Communication Port

Management IP Address	192.168.1.100
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1

A.2 Default Account of the Web Administrator

User Name	admin
Password	nsfocus

A.3 Default Account of the Console Administrator

User Name	admin
Password	nsfocus

A.4 Communication Parameters of the Console Port

Baud Rate	115200
Data Bits	8