

# Install ISE OS on an SNS Appliance Using NFS

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## Introduction

This document describes the steps to install ISE on an SNS appliance using NFS instead of a KVM virtual drive.

## Prerequisites

- SNS Server
- Identity Services Engine (ISE) ISO
- Network File System (NFS) Server

## Requirements

Cisco recommends that you have basic knowledge of ISE and SNS Cisco Integrated Management Controller (CIMC).

## Components Used

The information in this document is based on these software and hardware versions:

- SNS-36xx
- SNS-37xx

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

## Configuration

### Section 1. Enabling the NFS Server on Ubuntu

Step 1. Install the NFS server on Ubuntu using the command `sudo apt install nfs-kernel-server`.

Step 2. Create a directory for the NFS share with the command `sudo mkdir -p /mnt/nfs_share`.

Step 3. Remove restriction on the folder with `sudo chown -R superadmin:admin_group /mnt/nfs_share/`.

As per the command, `superadmin` refers to the user and `admin_group` refers to the user group. By this, you can restrict the user according to the user account and user group.

Step 4. Provide **Read & Write** privileges for the folder using `sudo chmod 327 /mnt/nfs_share`.

According to `chmod`, `327` folder name gives write and execute (3) permission for the user, `w` (2) for the group, and read, write, and execute for the users.

Step 5. Grant Access to the client system for the NFS folder with `sudo vim /etc/exports`.

After running the command, press **I** in order to insert the file path and client subnet to access the NFS share using `/mnt/nfs_share 192.168.146.0/24(rw,sync,nosubtree_check)`.

`/mnt/nfs_share`: The NFS folder which has been created on the system

`192.168.146.0/24`: The subnet that has been added is the client subnet which can access the NFS share

`rw`: Read & Write permission for the folder

`sync`: Write permission to the Harddisk

`no_subtree_check`: In order to skip the subtree check on the folder

Press `esc`, then type `:wq` in order to write and exit from the file `/etc/exports`.

Step 6. Export the NFS shared directory on the system using `sudo exportfs -a`.

Step 7. Restart the NFS service on the system in order to make the changes take effect using `sudo systemctl restart nfs-kernel-server`.

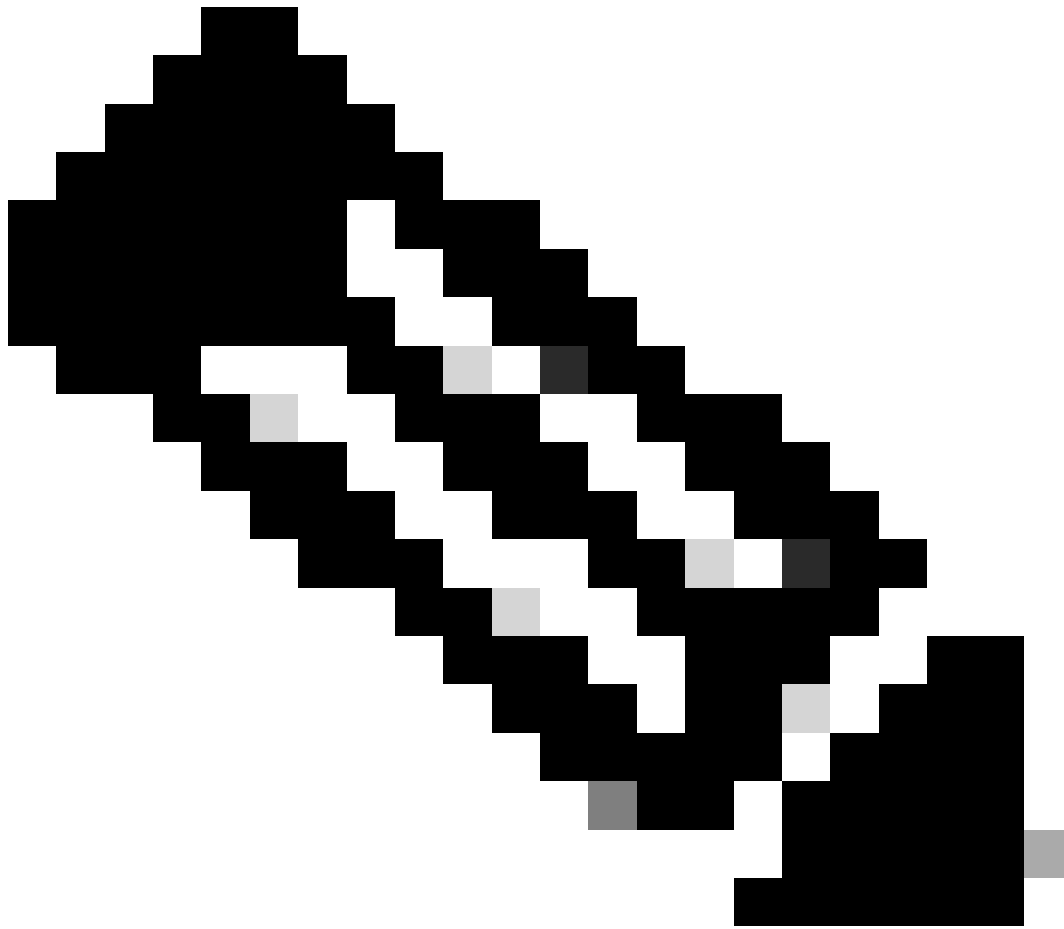


**Note:** Ensure that the NFS port is open on the operating system and establish communication between the NFS server and the ISE server to prevent any interruptions.

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## Section 2. Mapping the ISO to the Boot Device on Hardware

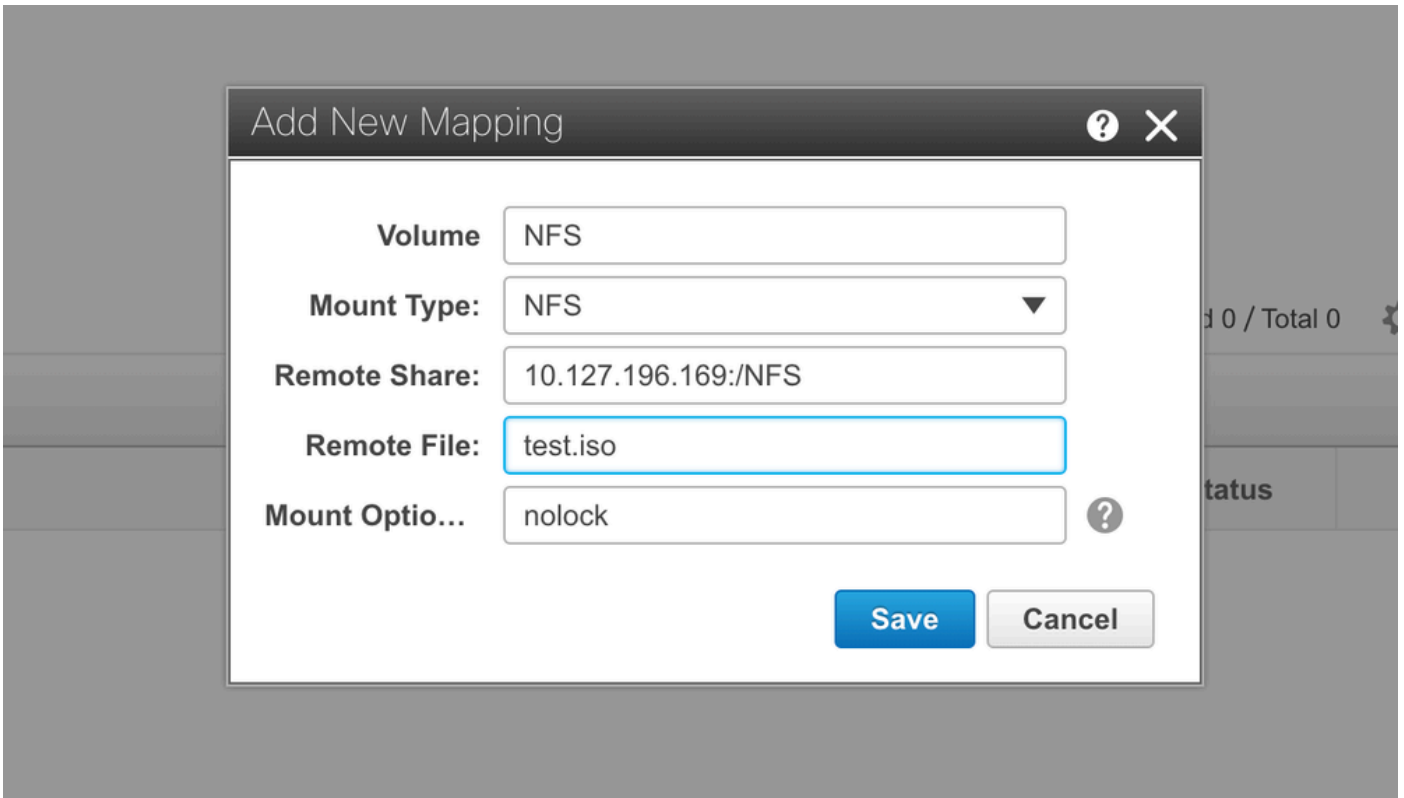
In order to download the ISE ISO from Cisco.com, navigate to Downloads > Products > Security > Access Control and Policy > Identity Services Engine > Identity Services Engine Software, [here](#).



**Note:** Ensure to check the release notes for supported hardware before preparing to install the ISO to the hardware.

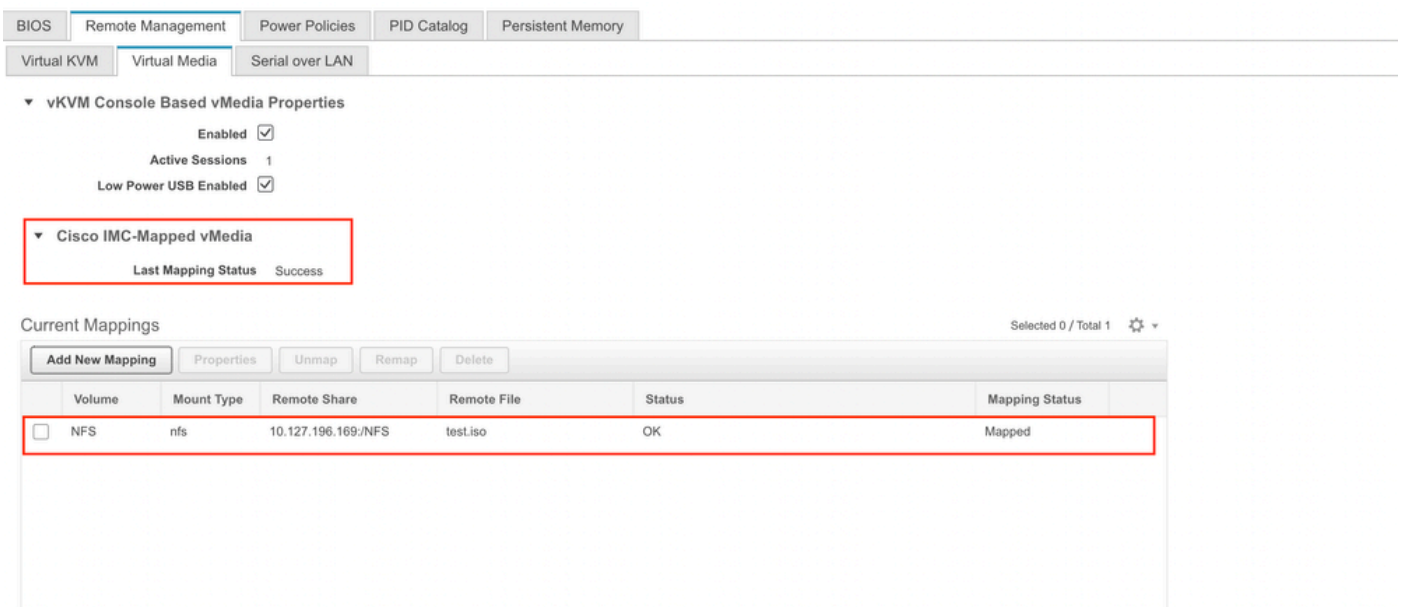
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Step 1. The NFS server must be mapped to the SNS box in order to proceed with the installation. In CIMC, navigate to Compute > Remote Management > Virtual Media > Add New Mapping.



In volume, the name of the Drive is provided and the Mount Type must be chosen as NFS.

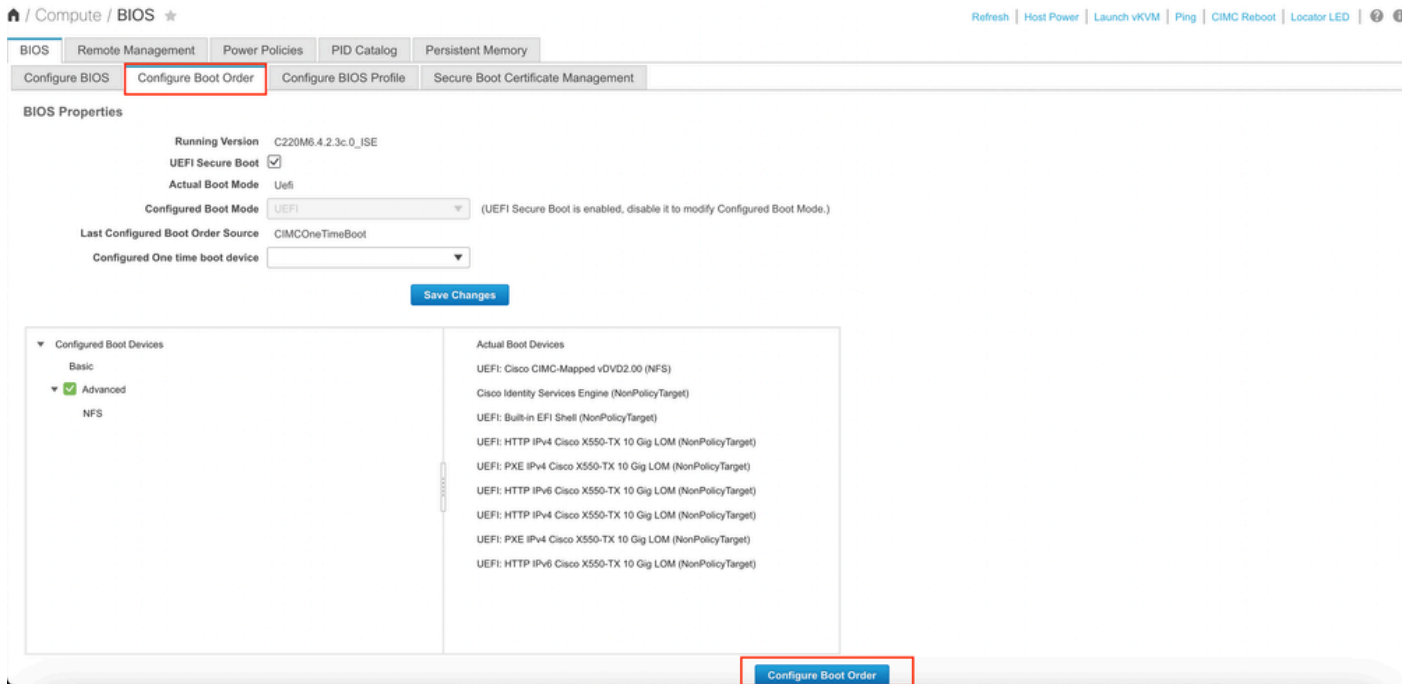
Under Remote Share, enter the server IP:/File path in order to fetch the image from the NFS server. In the Remote File, enter the file name of the image to be loaded on the Hardware SNS box.



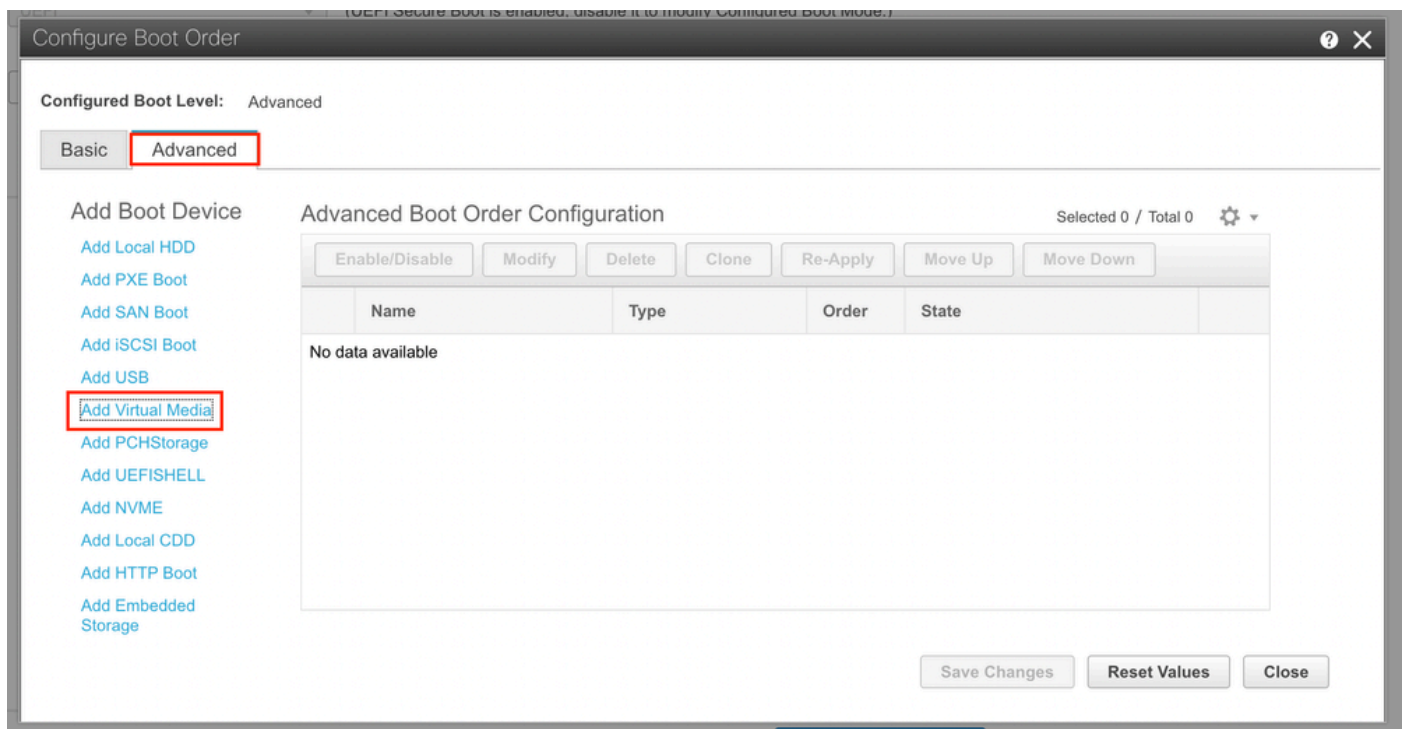
Verify the status of the mapped drive to be Successful.

Step 2. After that, the Boot order must be configured so that the ISE ISO can be booted from the SNS box.

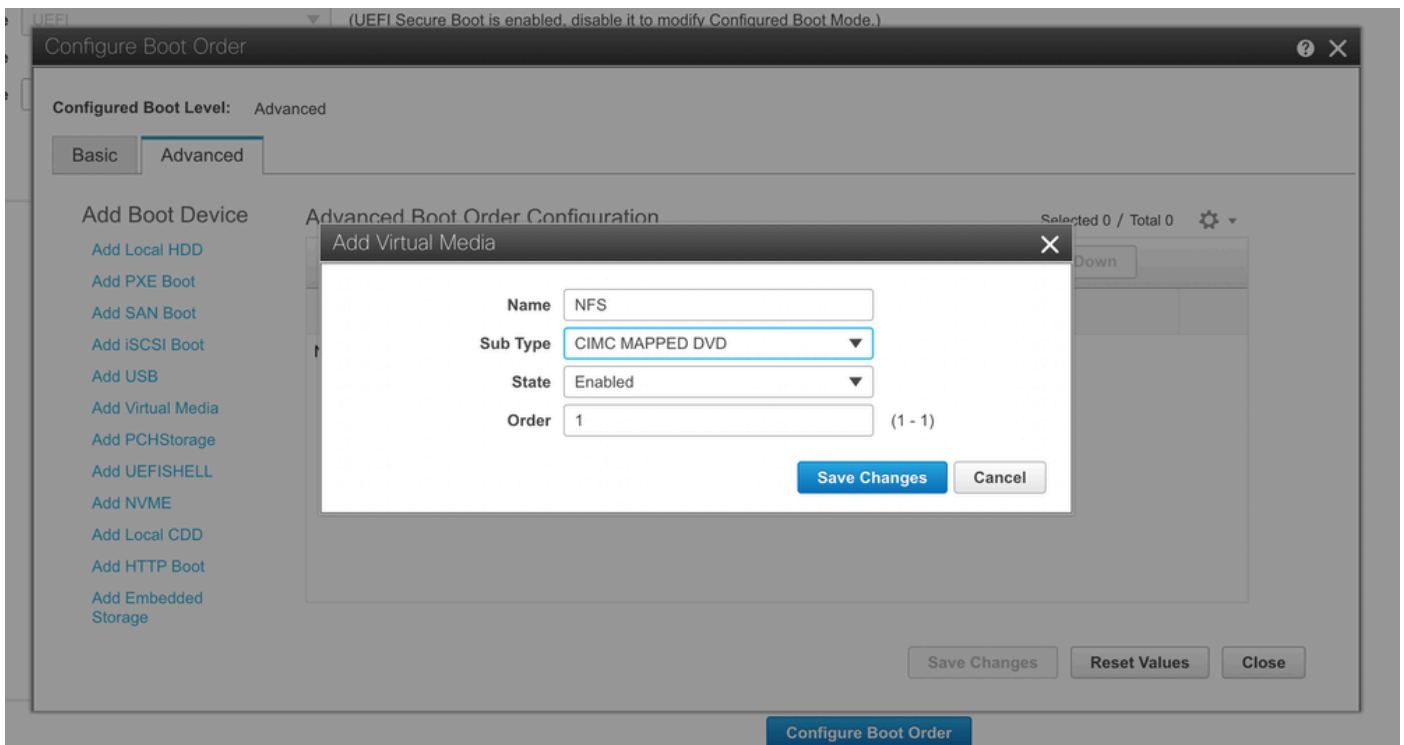
Navigate to BIOS > Configure Boot Order > Configure Boot Order. Refer to the next screenshot in order to navigate to the location.



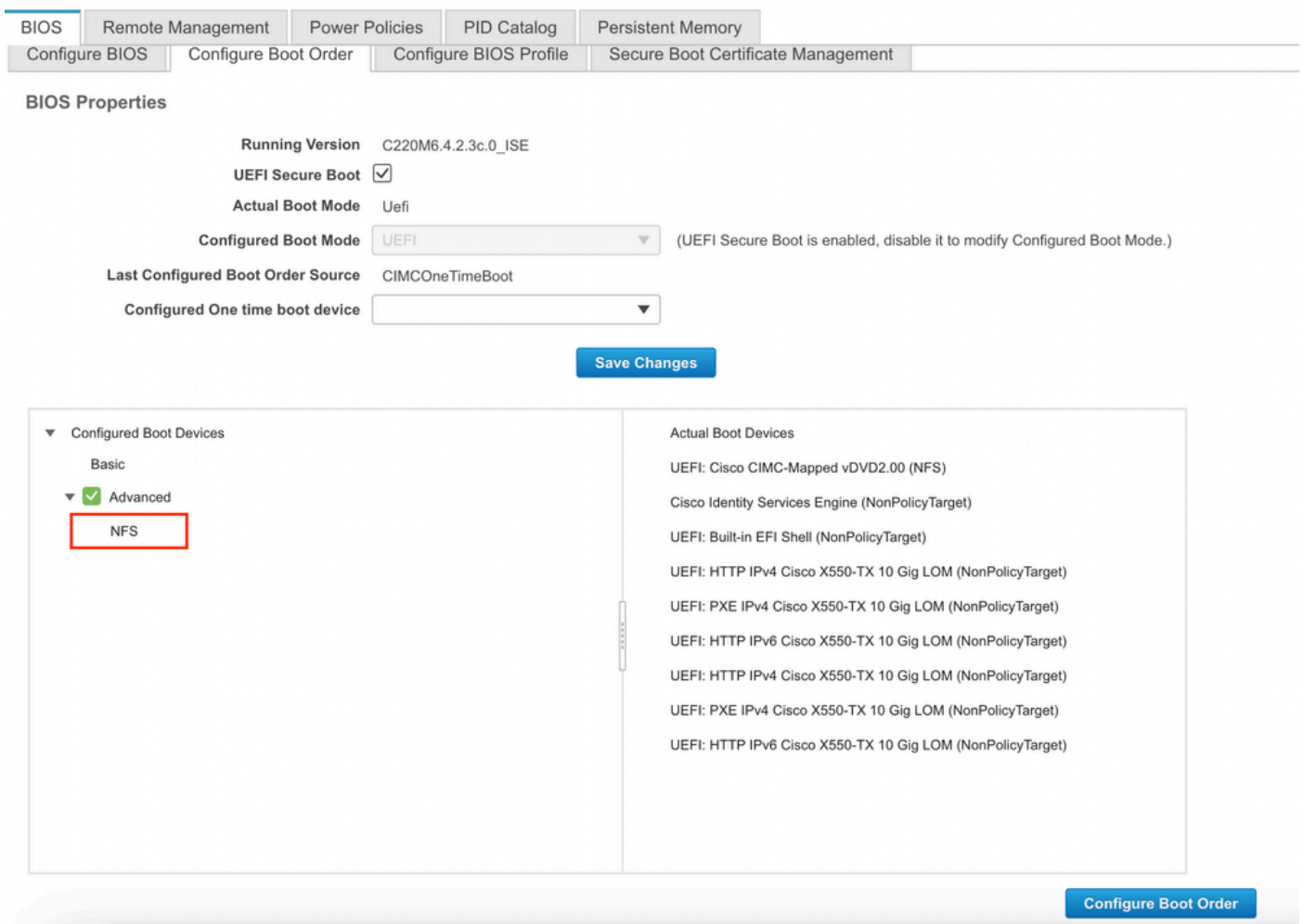
Then, click the **Advanced** Tab, and choose **Add Virtual Media** from the list of **Add Boot Device List**.

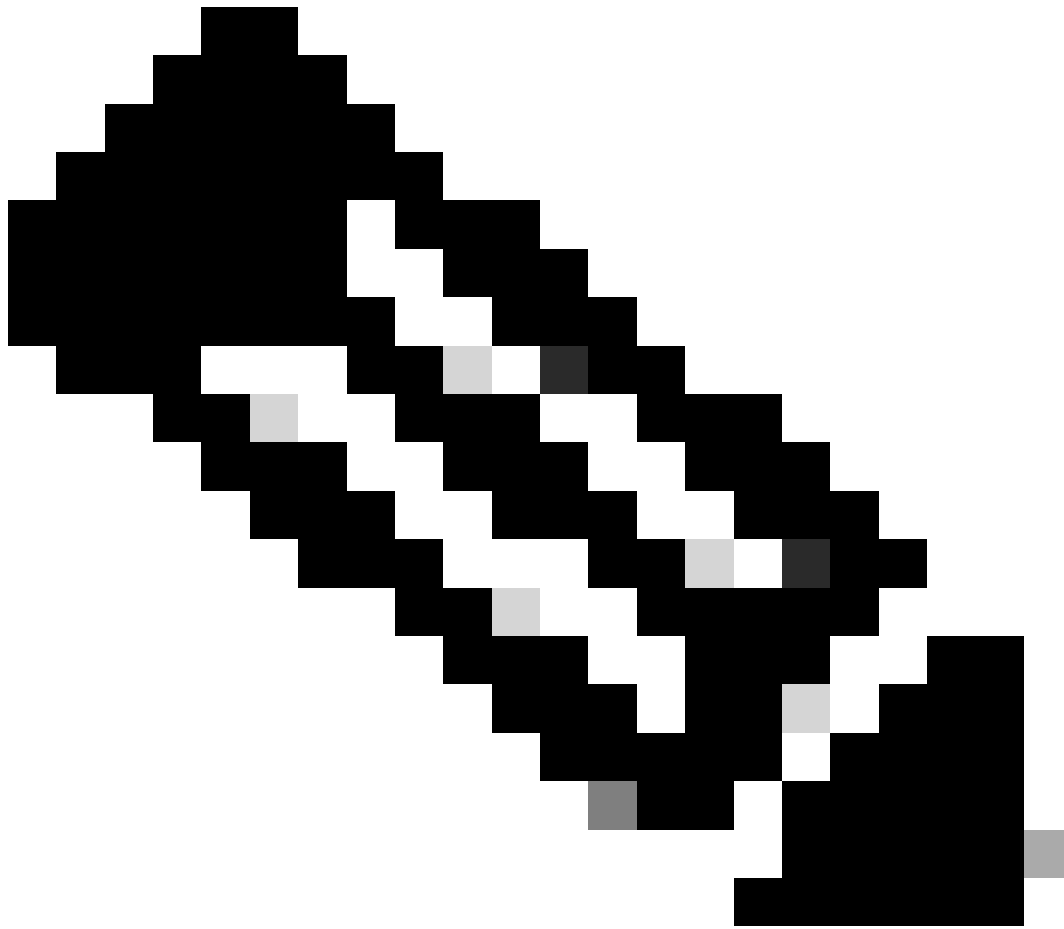


In the Name field, you can update the name of your preference. You must choose **CIMC Mapped DVD** under the subtype and save the changes.



The Name of the Virtual media populates under **Advanced** in the **Configure Boot Order**.





**Note:** The Boot drive mapping for 36xx and 37xx pursue similar steps.

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### **Section 3. Installation of ISE of 37xx Hardware**

Step 1. Launch the Keyboard/Video/Mouse (KVM) console from the SNS box by clicking on `Launch vKVM` from the top right corner of the CIMC GUI.



### Server Properties

Product Name: SNS-3715-K9  
Serial Number: [REDACTED]  
PID: SNS-3715-K9  
UUID: 720B048D-0FB1-4945-9196-0B90C0332A18  
BIOS Version: C220M6.4.2.3c.0\_ISE  
Description:   
Asset Tag:

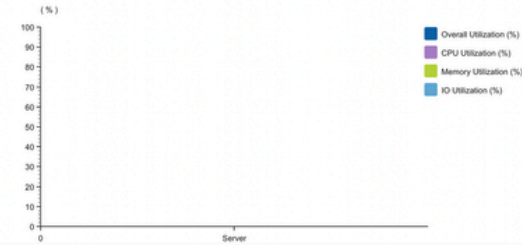
### Cisco Integrated Management Controller (Cisco IMC) Information

Hostname: [REDACTED]  
IP Address: [REDACTED]  
MAC Address: [REDACTED]  
Firmware Version: 4.2(3g)  
Current Time (UTC): Wed Oct 25 01:04:23 2023  
Local Time: Wed Oct 25 01:04:23 2023 UTC +0000 (Local)  
Timezone: UTC [Select Timezone](#)

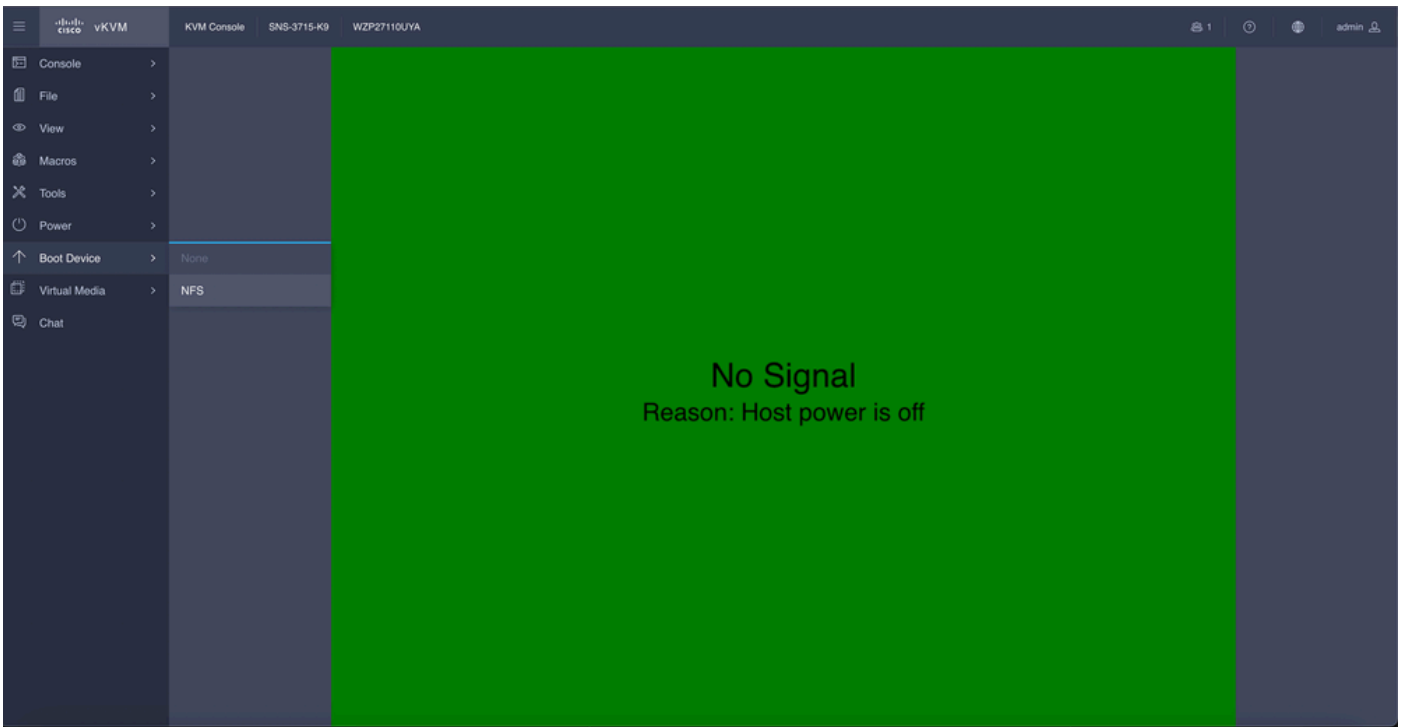
### Chassis Status

- Power State: ● On
- Post Completion Status: ● Completed
- Overall Server Status: ✔ Good
- Temperature: ✔ Good
- Overall DIMM Status: ✔ Good
- Power Supplies: ✔ Good
- Fans: ✔ Good
- Locator LED: ● Off
- Overall Storage Status: ✔ Good

### Server Utilization



Step 2. The KVM console launches on a new tab on the browser. On the left side of the screen, click **Boot Device** and choose the Name of the Virtual Media you created.



After choosing the Virtual Media in the KVM console, a prompt is populated on the screen. Click **confirm** in order to proceed further with booting the SNS box from the ISO image from the NFS server.

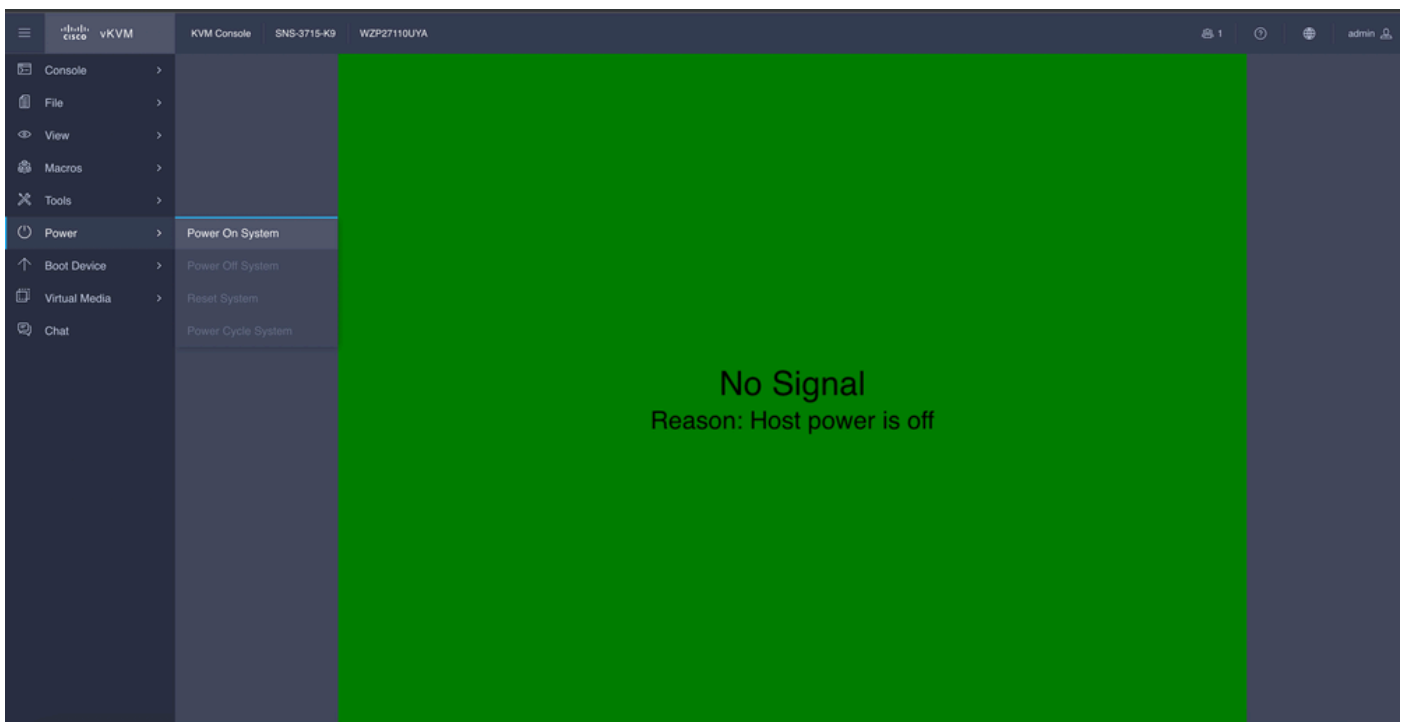
## Boot Device

You are about to change the one-time boot device. The server will boot from the selected boot device only for the next server boot, without disrupting the currently configured boot order. Once the server boots from the one-time boot device, all its future reboots occur from the previously configured boot order. Are you sure you want to continue?

Cancel

Confirm

Step 3. Power cycle the SNS box or turn on the SNS server in order to boot the server from the ISO. In order to turn on the SNS box or Power cycle the box, navigate to **Power** under **KVM** console.



After the server completes the booting process, you land on the installation menu of ISE. Choose **Cisco ISE Installation** (Keyboard/Monitor) in order to proceed with the installation.

```
Cisco ISE Installation (Keyboard/Monitor)
Cisco ISE Installation (Serial Console)
System Utilities (Keyboard/Monitor)
System Utilities (Serial Console)
Cisco ISE Installation Through ZTP Configuration (Serial Console)
```

Use the ▲ and ▼ keys to change the selection.  
Press 'e' to edit the selected item, or 'c' for a command prompt.

## Section 4. Installation of ISE of 36xx Hardware

In 36xx SNS Box, the steps to initiate the installation of ISE are similar but the KVM console GUI of 36xx is different from 37xx.

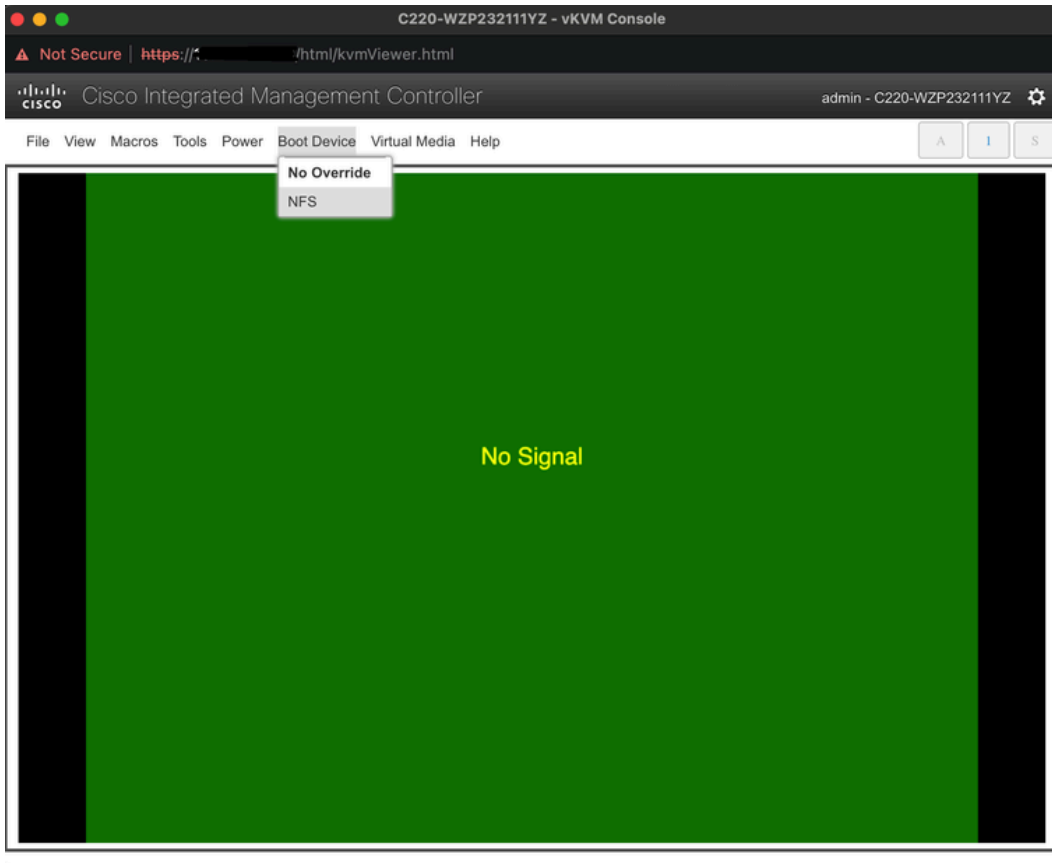
Step 1. Launch the KVM console from the SNS box by clicking the Launch vKVM from the top right corner of the CIMC GUI.

The screenshot displays the Cisco Integrated Management Controller (CIMC) GUI. The top navigation bar includes the Cisco logo, the title "Cisco Integrated Management Controller", and user information "admin@10.142.188.102 - C220-WZP232111YZ". The main content area is divided into several sections:

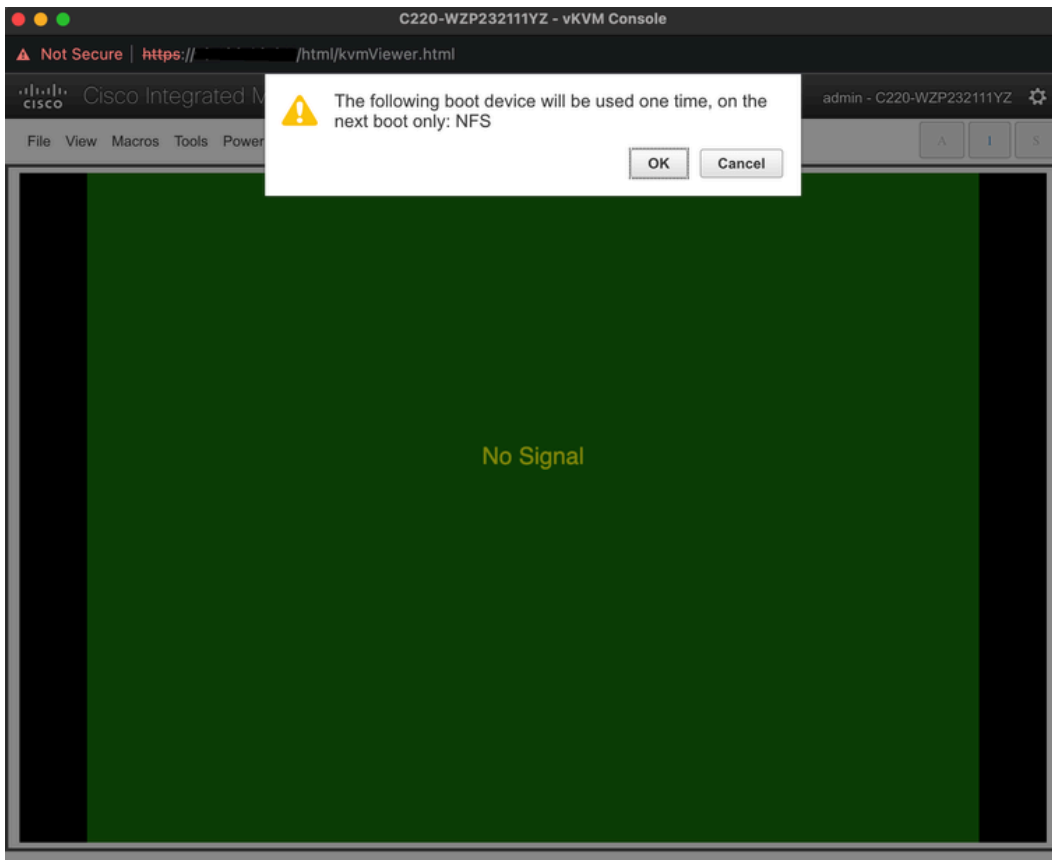
- Server Properties:** Lists details for SNS-3655-K9, including Serial Number, PID, UUID, BIOS Version (C220M5.4.0.4q.0\_ISE), Description, and Asset Tag (Unknown).
- Cisco Integrated Management Controller (Cisco IMC) Information:** Shows Hostname, IP Address, MAC Address (2C:4F:52:95:3C:D8), Firmware Version (4.1(3d)), Current Time (UTC), Local Time, and Timezone (UTC).
- Chassis Status:** Displays various health indicators: Power State (On), Overall Server Status (Good), Temperature (Good), Overall DIMM Status (Good), Power Supplies (Good), Fans (Good), Locator LED (Off), and Overall Storage Status (Good).
- Server Utilization:** Shows Overall Utilization (N/A), CPU Utilization (N/A), Memory Utilization (N/A), and IO Utilization (N/A).

At the bottom right, there are buttons for "Save Changes" and "Reset Values".

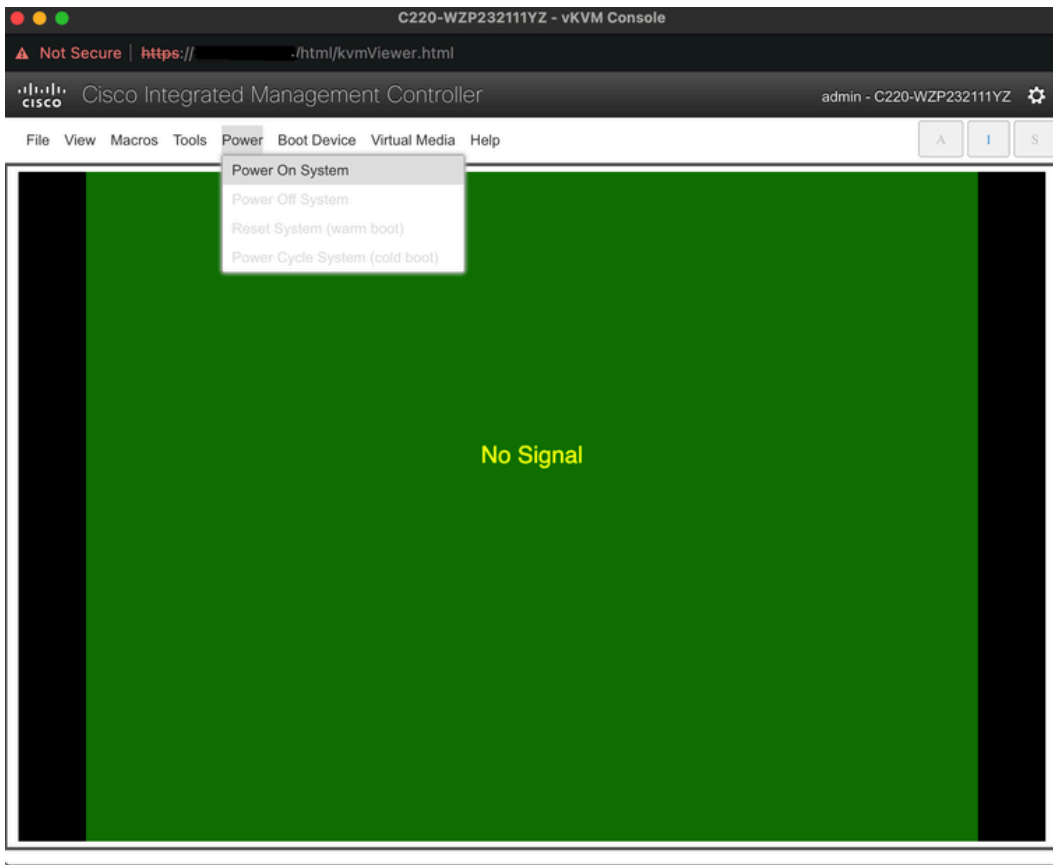
Step 2. The KVM console pops up on the new browser window. Click **Boot Device** and choose the Name of the Virtual Media you had created.



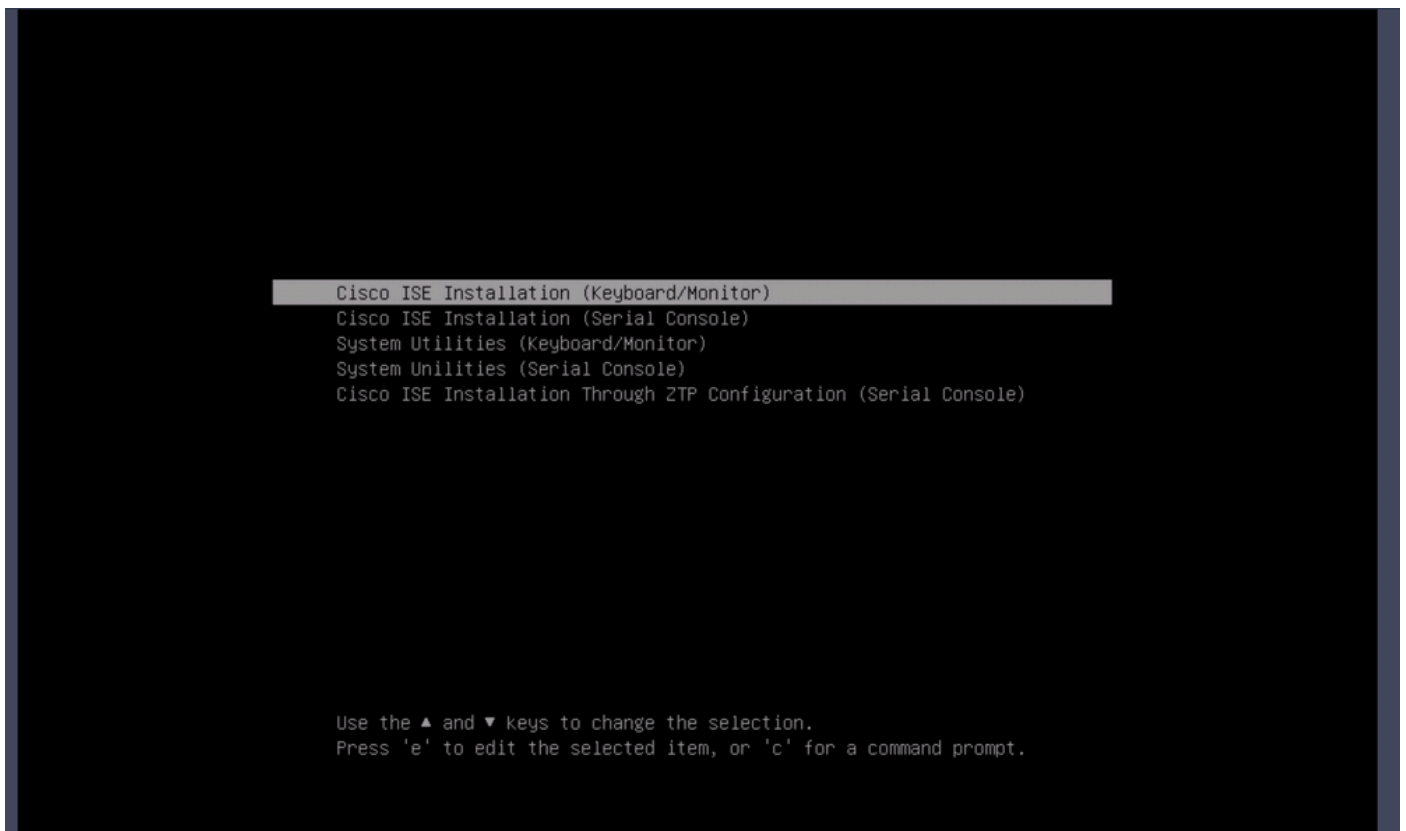
After choosing the Virtual Media in the KVM console, a prompt is populated on the screen. Click **Confirm** in order to proceed further with booting the SNS box from the ISO image from the NFS server.



Step 3. Power cycle the SNS box or turn on the SNS server in order to boot the server from the ISO. In order to turn on the SNS box or power cycle the box, navigate to **Power** under the **KVM** console.



After the server completes the booting process, you land on the installation menu of ISE. Choose **Cisco ISE Installation** (Keyboard/Monitor) in order to proceed with the installation.



## Section 5: Unmounting the ISO Image from the CIMC Box (SNS 36xx and SNS 37xx)

Step 1. In CIMC, navigate to BIOS > Configure Boot Order > Configure Boot Order. Refer to the next screenshot in order to navigate to the location.

The screenshot displays the BIOS configuration page for 'Configure Boot Order'. The navigation tabs at the top include BIOS, Remote Management, Power Policies, PID Catalog, and Persistent Memory. Under the BIOS tab, there are sub-tabs for Configure BIOS, Configure Boot Order, Configure BIOS Profile, and Secure Boot Certificate Management. The 'Configure Boot Order' sub-tab is active.

**BIOS Properties**

- Running Version: C220M6.4.2.3c.0\_ISE
- UEFI Secure Boot:
- Actual Boot Mode: Uefi
- Configured Boot Mode: UEFI (UEFI Secure Boot is enabled, disable it to modify Configured Boot Mode.)
- Last Configured Boot Order Source: CIMCOneTimeBoot
- Configured One time boot device: [Empty dropdown]

**Save Changes**

**Configured Boot Devices**

- Basic
- Advanced  (NFS is highlighted with a red box)

**Actual Boot Devices**

- UEFI: Cisco CIMC-Mapped vDVD2.00 (NFS)
- Cisco Identity Services Engine (NonPolicyTarget)
- UEFI: Built-in EFI Shell (NonPolicyTarget)
- UEFI: HTTP IPv4 Cisco X550-TX 10 Gig LOM (NonPolicyTarget)
- UEFI: PXE IPv4 Cisco X550-TX 10 Gig LOM (NonPolicyTarget)
- UEFI: HTTP IPv6 Cisco X550-TX 10 Gig LOM (NonPolicyTarget)
- UEFI: HTTP IPv4 Cisco X550-TX 10 Gig LOM (NonPolicyTarget)
- UEFI: PXE IPv4 Cisco X550-TX 10 Gig LOM (NonPolicyTarget)
- UEFI: HTTP IPv6 Cisco X550-TX 10 Gig LOM (NonPolicyTarget)

**Configure Boot Order**

Step 2. Then, click the **Advanced Tab**, and choose **Add Virtual Media**.

Configure Boot Order

Configured Boot Level: Advanced

Basic | **Advanced**

Add Boot Device

- Add Local HDD
- Add PXE Boot
- Add SAN Boot
- Add iSCSI Boot
- Add USB
- Add Virtual Media
- Add PCHStorage
- Add UEFISHELL
- Add NVME
- Add Local CDD
- Add HTTP Boot
- Add Embedded Storage

Advanced Boot Order Configuration

Selected 1 / Total 1

Enable/Disable | Modify | Delete | Clone | Re-Apply | Move Up | Move Down

	Name	Type	Order	State
<input checked="" type="checkbox"/>	NFS	VMEDIA	1	Enabled

Save Changes | Reset Values | Close

Step 3. Choose the Virtual media from the list and click delete from the list. This unmounts the ISO from the CIMC.