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Infoblox Installation Guide vNIOS™ for VMware®

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Company Information

http://www.infoblox.com/contact

Product Information


Warranty Information

Your purchase includes a 90-day software warranty and a one year limited warranty on the Infoblox appliance, plus an Infoblox Warranty Support Plan and Technical Support. For more information about Infoblox Warranty information, refer to Infoblox Web site, or contact Infoblox Technical Support.
Chapter 1 Introduction

This chapter provides information about the Infoblox NIOS virtual appliance for VMware. It also describes the requirements to install the NIOS virtual appliance on VMware ESX or ESXi server. It includes the following topics:

- About Infoblox NIOS Virtual Appliance for VMware
- Requirements
About Infoblox NIOS Virtual Appliance for VMware

The Infoblox NIOS virtual on VMware software can run on ESX or ESXi servers that have DAS (Direct Attached Storage), or iSCSI (Internet Small Computer System Interface) or FC (Fibre Channel) SAN (Storage Area Network) attached. You can install the NIOS virtual software package on a host with VMware ESX or ESXi 6.x.x, 5.5.x, 5.1.x, or 5.0.x installed, and then configure it as a virtual appliance. You can also install the NIOS virtual software on Cisco SRE-V (Services Ready Engine Virtualization). For more information, see Configuring SRE-V Service Module to Install NIOS virtual Appliance.

The Infoblox NIOS provides core network services and a framework for integrating all the components of the modular Infoblox solution. Infoblox NIOS provides integrated, secure, and easy-to-manage DNS (Domain Name System), DHCP (Dynamic Host Configuration Protocol) and IPAM (IP address management) services. In addition to DNS, DHCP and IPAM, the NIOS software also provides TFTP, HTTP, NTP, and FTP file transfer services.

Infoblox NIOS virtual appliance for VMware provides most of the features supported by the NIOS, with some limitations. (For information, see Known Limitations.)

NIOS virtual appliances support the following features:

- Configuration as an HA pair, a Grid master, Reporting server, or a Grid master candidate
- Anycast addressing
- OSPF
- BGP
- Static routes
- IPv6

vSphere vMotion is also supported. You can migrate NIOS virtual appliances from one ESX or ESXi server to another without any service outages. The migration preserves the hardware IDs and licenses of the NIOS virtual appliances. VMware Tools is automatically installed for each NIOS virtual appliance. Infoblox supports the control functions in VMware Tools. For example, through the vSphere client, you can shut down the virtual appliance. For information about migrating a NIOS virtual appliance, see Migrating NIOS Virtual Appliances.

You can configure most NIOS virtual appliances as independent or HA (high availability) Grid Masters, Grid Master candidates, and Grid members. Table lists the NIOS virtual appliance models and their specifications. Note that each NIOS virtual appliance requires a unique hardware ID. Infoblox does not support cloned VM instances as NIOS virtual appliances.

Basic VM disk allocations include the following:

- IB-VM-100, IB-VM-810, IB-VM-820, and IB-VM-1410 NIOS virtual appliances support 55 GB or 160 GB hard disk allocation.
- Cloud Platform CP-800, CP-1400, and CP-2200 NIOS virtual appliances support 160 GB hard disk allocation.
- Network Insight ND-V800, ND-V805, ND-V1400, ND-V1405, ND-V2200, and ND-V2205 NIOS virtual appliances support 160 GB hard disk allocation.

50 GB and 55 GB NIOS virtual appliances and Network Insight VM models support Grid member status, but do not support Grid Master or Grid Master Candidate operation.

Note: To maintain high performance on your NIOS virtual appliances and to avoid not having enough resources to service all the NIOS virtual appliances, DO NOT oversubscribe physical resources on the virtualization host. Required memory, CPU, and disk resources must be adequately allocated for each NIOS virtual appliance that is running on the virtualization host. For information about the required memory, CPU, and disk allocation for each NIOS virtual appliance model, see Table.

<table>
<thead>
<tr>
<th>Trinzic Series Virtual Appliances</th>
<th>Overall Disk (GB)</th>
<th># of CPU Cores</th>
<th>Memory Allocation</th>
<th>Virtual CPU Core Frequency Limit</th>
<th>Supported as Grid Master and Grid Master Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB-VM-100</td>
<td>55</td>
<td>1</td>
<td>1 GB</td>
<td>1300 MHz</td>
<td>No</td>
</tr>
<tr>
<td>IB-VM-800 (for reporting only; 1 GB daily limit) ¹</td>
<td>300 (Primary &amp; Reporting)</td>
<td>2</td>
<td>Range: 2 – 8 GB Default: 8 GB</td>
<td>3000 MHZ</td>
<td>No</td>
</tr>
<tr>
<td>IB-VM-800 (for reporting only; 2 GB daily limit) ¹</td>
<td>300 v</td>
<td>2</td>
<td>Range: 4 – 8 GB Default: 8 GB</td>
<td>3000 MHZ</td>
<td>No</td>
</tr>
<tr>
<td>IB-VM-805 (for reporting only) ²</td>
<td>250 (+ 1 TB user defined reporting storage)</td>
<td>2</td>
<td>32 GB</td>
<td>2800 MHz</td>
<td>No</td>
</tr>
<tr>
<td>IB-VM-810</td>
<td>55</td>
<td>2</td>
<td>2 GB</td>
<td>2000 MHz</td>
<td>No ²</td>
</tr>
<tr>
<td>IB-V815</td>
<td>250</td>
<td>2</td>
<td>16 GB</td>
<td>1100 MHz</td>
<td>No ²</td>
</tr>
<tr>
<td>IB-VM-810</td>
<td>160</td>
<td>2</td>
<td>2 GB</td>
<td>2000 MHz</td>
<td>No ²</td>
</tr>
<tr>
<td>IB-VM-820</td>
<td>55</td>
<td>2</td>
<td>4 GB</td>
<td>3000 MHZ</td>
<td>Yes ²</td>
</tr>
</tbody>
</table>

¹ For reporting only
² For reporting only

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<table>
<thead>
<tr>
<th>Network Insight Virtual Appliances</th>
<th>Overall Disk (GB)</th>
<th># of CPU Cores</th>
<th>Memory Allocation</th>
<th>Virtual CPU Core Frequency Limit</th>
<th>Supported as Grid Master and Grid Master Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td>ND-V800¹</td>
<td>160</td>
<td>2</td>
<td>8 GB</td>
<td>3000 MHz</td>
<td>No</td>
</tr>
<tr>
<td>ND-805¹</td>
<td>250</td>
<td>2</td>
<td>32 GB</td>
<td>2800 MHz</td>
<td>No</td>
</tr>
<tr>
<td>ND-V1400¹</td>
<td>160</td>
<td>4</td>
<td>16 GB</td>
<td>8000 MHz</td>
<td>No</td>
</tr>
<tr>
<td>ND-V1405</td>
<td>250</td>
<td>4</td>
<td>32 GB</td>
<td>3600 MHz</td>
<td>No</td>
</tr>
<tr>
<td>ND-V2200</td>
<td>160</td>
<td>8</td>
<td>24 GB</td>
<td>24000 MHz</td>
<td>No</td>
</tr>
<tr>
<td>ND-V4005</td>
<td>250</td>
<td>14</td>
<td>128</td>
<td>2400 MHz</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cloud Platform Virtual Appliances</th>
<th>Overall Disk (GB)</th>
<th># of CPU Cores</th>
<th>Memory Allocation</th>
<th>Virtual CPU Core Frequency Limit</th>
<th>Supported as Grid Master and Grid Master Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-V800</td>
<td>160</td>
<td>2</td>
<td>2 GB</td>
<td>2000 MHz</td>
<td>No</td>
</tr>
<tr>
<td>CP-V1400</td>
<td>160</td>
<td>4</td>
<td>8 GB</td>
<td>6000 MHz</td>
<td>No</td>
</tr>
<tr>
<td>CP-V2200</td>
<td>160</td>
<td>4</td>
<td>12 GB</td>
<td>12000 MHz</td>
<td>No</td>
</tr>
</tbody>
</table>

**Note:**

1. This virtual appliance does not support Elastic Scaling.
2. The Identity Mapping feature is supported on the IB-VM-810 and IB-VM-820 appliances only if they are configured as Grid members, not as the Grid Master. When configuring IB-VM 820 as the Grid Master, ensure that you upgrade the memory allocation to 4 GB.
Requirements

You can install the Infoblox NIOS virtual appliance on VMware ESX/ESXi server 4.x or ESXi server 5.x and configure it as one of the supported virtual appliances. You can configure the storage with 50 GB/55 GB/120 GB/160 GB depending on the appliance model. For information about model specifications, see Table. Note that the NIOS virtual appliance for VMware can run on ESX or ESXi servers that have DAS (Direct Attached System) or iSCSI (Internet Small Computer System Interface) SAN (Storage Area Network) attached. For information about VMware products, refer to the VMware documentation.

You can also install the NIOS virtual appliance on Cisco SRE-V, which is part of the Cisco UCS (Unified Computing System) Express. Cisco SRE-V enables the VMware vSphere™ Hypervisor to be provisioned on Cisco SRE 700 and 900 Service Modules. The Cisco SRE Service Module can reside either in the Cisco 2900 series or 3900 series ISR G2. The service module must have SRE-V version 1.0.1 with OS 15.1(3)T or later installed. For more information about Cisco SRE-V, refer to the Cisco documentation. The following table lists the supported NIOS virtual appliance models on VMware with Cisco SRE 700 and SRE 900 service modules.

Model Specifications

<table>
<thead>
<tr>
<th>NIOS Virtual on VMware</th>
<th>Cisco SRE 700</th>
<th>Cisco SRE 900</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB-VM-BOB</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>IB-VM-250</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>IB-VM-550</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>IB-VM-1050</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>IB-VM-810</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>IB-VM-820</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The following are required to install the NIOS virtual appliance on a VMware ESX/ESXi server or Cisco SRE-V platform:

- The NIOS software package. You can download the NIOS software from the Infoblox Technical Support site. To download the software, you must have a valid login account on the Infoblox Support site. Register your product at https://support.infoblox.com if you do not already have an account. The NIOS software package consists of a template file with .ova extension for all the supported NIOS appliance models. Make sure that you download the file with an extension that corresponds to the appliance model number. For example, to install IB-VM-550 with a 50 GB disk on VMware ESX or ESXi servers, download nios-X.X.X-241423-201X-05-26-08-02-40-50G-550.ova. For IB-VM-810 with a 160 GB disk, download the file that has the extension xxxx-160G-810.ova. For information about the NIOS appliance models on VMware, see Table.

  **Note:** After you download the .ova file, you can run the `tar -xvf nios-xxx.ova` command to untar the .ova and separate .ovf and .vmdk files.

- You can deploy the NIOS virtual appliance from a remote web server or a local file system accessible from your management system.

- A management system that has an installed vSphere Client. To manage multiple hosts, the vSphere Client must be connected to the vCenter Server system.
Chapter 2 Deploying NIOS Virtual Appliances

This chapter describes how to deploy the NIOS virtual appliance on VMware using vSphere Client. This chapter includes the following topics:

- Deploying NIOS virtual Appliances on VMware
- Installing the NIOS virtual or Reporting Virtual Appliance
- Obtaining and Installing Your VM Licenses
  - Obtaining License Keys for Existing VM Instances
  - Running the Show License Command
  - Downloading License Keys for Multiple VM Instances
- Configuring the Virtual NICs

NIOS virtual appliances will not operate without a license. To ensure that your VMs will operate until you can install permanent license keys, you can run the `set temp_license` command in the NIOS command line for any VM. For information, see the section Managing Licenses in the Infoblox NIOS Administrator Guide.
Deploying NIOS Virtual Appliances on VMware

Before setting up a NIOS virtual appliance as a Grid Master or Grid member, you install the virtual appliance on the VMware or Cisco-SRE-V platform. The instructions in this section assume that you have configured the server on your network, and you are able to connect to it from your management station. (For information about configuring the VMware products and Cisco SRE-V, refer to the VMware and Cisco documentation respectively.) Infoblox recommends that you back up your existing configuration before deploying a NIOS virtual appliance.

- Order your virtual Infoblox (NIOS virtual) appliances from your Infoblox representative.
- If you plan to use Elastic Scaling for deployment, obtain dynamic licenses for the features you want to use. For information about Elastic Scaling, refer to the About Elastic Scaling section of the Infoblox NIOS Administrator Guide.
- If you have one or more NIOS VMs already running on your server under a temporary license(s), ensure that the temporary licenses are not expired before you establish a permanent license on each VM. Should any of the respective temporary licenses be expired, the process of applying a permanent license to the VM entails a complete reset of all data and settings in the VM to factory defaults. Prior backups from a VM with an expired temporary license remain valid and restored backups from a temporary-licensed VM will not override a newly installed permanent license.
- Make a record of your VM registration numbers from the Contract Notification email sent to you after purchase of your virtual appliances.

To deploy a NIOS virtual appliance, log in to the vSphere Client, connect to the ESX or ESXi server or Cisco SRE-V, and then complete the following:

1. Download the NIOS virtual virtual machine image files from the Infoblox Support site.
2. Install the NIOS virtual or reporting virtual appliance, as described in Installing the NIOS Virtual or Reporting Virtual Appliance.
3. If you are using Elastic Scaling for your deployment, log in to the NIOS GUI (Grid Manager) and do the following:
   - Create offline Grid members you plan to join the Grid.
   - Pre-provision these Grid members.
   - Generate a token for each member. Copy the certification and token strings and save it for later use.
   For detailed instructions on how to pre-provision a member and obtain a token, refer to the Infoblox NIOS Administrator Guide.
   
   **Note:** Elastic Scaling for the Grid Master and HA (High Availability) is not supported.

4. As you install and start each VM, use the `show hwid` command to obtain the Hardware ID number for the new VM; then, make a record of the Hardware ID number and the VM Registration Number for each VM.
5. Download and Install the license or licenses for your NIOS virtual appliance or appliances as described in Obtaining and Installing Your VM Licenses.
6. Configure the NICs (Virtual Network Adapters) of the NIOS virtual appliance, as described in Configuring the Virtual NICs.
7. Register each of your virtual appliances through the Infoblox Support portal.
1. Order the Infoblox NIOS Virtual Appliance(s) from Infoblox. You will receive a Contract Notification email from Infoblox containing the licensing information for each purchased virtual machine. The email has the VM registration numbers that are assigned directly to each VM.

   **Note:** Ensure that the technical personnel who will be installing and configuring the VMs receive a copy of the Contract Notification email. The VM operators need to correlate the Hardware ID values for each VM to the VM registration number for each virtual machine. For details, see the section **Downloading License Keys for Multiple VM Instances**.

2. Download the OVA package.
3. Log in to the VMware vSphere Web Client.
4. From the vSphere Web Client, click **vCenter Hosts and Clusters**, and then select the resource pool that you used to install the Infoblox NIOS virtual instance.
5. Right click the resource pool and select **Deploy OVF Template**. The **Deploy OVF Template** dialog appears.
6. Depending on the download location of the NIOS virtual OVA package, select **URL** and enter the URL for the OVA file to deploy it from a remote web server, or select **Local file** and click **Browse** to locate the OVA file.

   ![Deploy OVF Template dialog](image)

   7. Select and open the OVA file, and then click **Next**.
      
      **NOTE:** To guide you through the deployment process, each time you click **Next** in the **Deploy OVF Template** dialog, the corresponding step is highlighted on the left navigation bar.

   8. Review the OVA package details and click **Next**.

   9. Click **Accept** to accept the end-user license agreement, and then click **Next**.

   10. In the **Select name and folder** step, you can rename the NIOS virtual instance (the default is NIOS virtual) and select a folder or datacenter in which the NIOS virtual instance is located. Note that you must use a unique name for the NIOS virtual instance in the folder you select. Also, the folder is used for applying permissions to the NIOS virtual instance. Click **Next** after you finish.
11. In the Select configuration step, select the appliance model from the Configuration drop-down menu, and then click Next. The number of virtual CPUs and memory is displayed for the selected appliance model. If you are deploying a reporting appliance, select one of the following models: TR-V805, TR-V1405, TR-V2205, TR-V4005, or IB-V5005 or Other Model. Ensure that you select the correct model for your virtual appliance. Otherwise, you may experience performance issues.

Note: An IB-FLEX instance supports VMware ESXi with or without SR-IOV enabled. For IB-FLEX, select IB-V5005 or Other Model as the appliance model. For more information about IB-FLEX, see About IB-FLEX.
12. In the Select storage step, complete the following to specify the storage format for the NIOS virtual instance, and then click Next.

- **Select virtual disk format**: Select **Thin Provision**, which allocates storage space as needed without reserving a set amount of storage space for the NIOS virtual appliance.

13. In the **Setup networks** step, select the network you want to assign to the NIOS virtual instance in the **Destination** column, and then click Next.

14. In the **Customize template** step, complete the following settings for the NIOS virtual instance:

   a. **Uncategorized**: Expand this setting and complete the following:
i. **Temp License**: For evaluation purpose, skip this setting. Enter the licenses you want to install on the NIOS virtual instance. Depending on whether you are deploying the Grid Master or Grid member, you may install temporary licenses for the Grid Master and dynamic licenses for the Grid member. Use a space or comma (,) to separate the licenses. For example, you can enter `dns nios enterprise`. Otherwise, leave this blank.

ii. **Enable Remote Console**: Select the checkbox to enable remote access through SSH.

iii. **Admin Password**: Enter the admin password here if you want to change it. The default is `infoblox`.

b. **Gridmaster**: Expand this setting only if you already have a Grid set up properly and want to join the NIOS virtual instance to the Grid. For evaluation purpose, skip this setting.

   i. **Certificate**: Copy and paste the string of the Infoblox NIOS certificate credential generated for the Grid member token for authentication purposes.

   ii. **IP Address**: Enter the IP address for the Grid Master.

   iii. **Token**: Copy and paste the member token here for joining the Grid Master.

   **Note**: The certificate and token are generated on the Grid Master when you pre-provision the NIOS virtual instance. The certificate and token values are valid only for a period of time. For information, see About Elastic Scaling in the [Infoblox Administration Guide](#).

c. **Networking**: Expand this setting and add the LAN1 IP address, LAN1 default gateway, and LAN1 netmask accordingly. These can be either IPv4 or IPv6. The LAN1 IP address is the address that you access the NIOS virtual appliance from a web browser. This address resides in the VLAN or network that you have selected in the `Setup networks` step. After you complete the networking settings, click **Next**.

15. In the **Ready to complete** dialog, review and verify the summary of your configurations. If necessary, click **Back** to modify your configurations. Ensure that you **DO NOT** select the **Power on after deployment** check box if you are using Elastic Scaling for your deployment. Click **Finish**.

The NIOS virtual installation begins, and you can monitor the OVF deployment on the upper right hand corner of the screen. When the installation completes, you can find the newly created NIOS virtual instance inside the folder you have selected.

16. **Reporting appliances only**: Complete this step only if you are deploying a reporting virtual appliance. Otherwise, move on to the next step. To deploy a NIOS virtual reporting instance, you must configure two virtual hard disks. Complete the following to add a second hard disk drive:

   a. Select the newly created reporting appliance and click **Edit virtual machine settings** in the **Getting Started** tab.
b. In the *Edit Settings* dialog, scroll to the bottom and select **New Hard Disk** from the **New Device** menu, and then click **Add**. The newly added hard disk has 8GB by default. Click **OK** to save your configuration. Note that you may change the size of the hard disk drive, but the minimum is 5GB.

17. In the left navigation bar, scroll down to the newly created NIOS virtual instance and click on it.
18. In the **Getting Started** tab, go to the **Basic Tasks** section, and click **Power on the virtual machine** to turn on the appliance.

19. Select the NIOS virtual instance after it has been powered on. Click the **Summary** tab, and then click **Open with VMRC** to launch the VM console.
20. Once the console is launched, enter the admin username and password. The default is admin and infoblox respectively.

21. Ping the default gateway. If successful, move on to the next step. Otherwise, troubleshoot the NIOS virtual settings and the default gateway IP address.

22. Skip this step if you are deploying a reporting instance. At the infoblox > prompt, enter set temp_license. For a NIOS virtual instance, enter 2 to install the Grid (DNS, DHCP, Grid) licenses and type y to proceed. Note that this configuration is for minimal evaluation purposes.
23. At the Infoblox > prompt, enter 4 to add the NIOS license for your NIOS virtual or reporting instance.
   **NOTE:** When selecting the NIOS virtual license from the list, ensure that you select the model for which you have provisioned your NIOS virtual instance. For example, if you are deploying a reporting instance, ensure that you select one of the following: IB-V805 (TR-V805), IB-V1405 (TR-V1405), IB-V2205 (TR-V2205), IB-V4005 (TR-4005), or IB-V5005. Otherwise, you might run into performance issues.

24. **Reporting appliances only:** Complete this step only if you are deploying a reporting virtual appliance. Otherwise, go to the next step.
   a. At the Infoblox > prompt, enter `set temp_license`. For a reporting appliance, you need to install the Grid license. So, enter 2 to install the Grid (DNS, DHCP, Grid) licenses, and then enter y to proceed.
   b. At the Infoblox > prompt, install the Reporting license by entering 3 and then y to proceed.
25. The NIOS virtual instance will now restart. Note that it might take a couple minutes for the instance to restart. For information about how to join the NIOS virtual appliance to the Grid, see Joining NIOS virtual Appliances to the Grid.

26. **Reporting appliances only**: Complete this step for joining a reporting virtual appliance to the Grid.
   
   a. Log in to the VM console again.

   b. At the `Infoblox >` prompt, enter `set membership` to join the reporting server to the Grid.

   c. Enter the Grid Name and the Shared Secret, and then enter y to proceed.

   d. The reporting service will now restart and initiate the join sequence with the Grid Master. If you see the following message, you have successfully joined the reporting server to the Grid.
After the restart has completed, you can open a web browser and enter `https://<IP address of LAN1>` to log in to Grid Manager to configure your NIOS virtual or reporting virtual appliance. For more information about how to configure a NIOS virtual or reporting member, refer to the [Infoblox Administration Guide](https://www.infoblox.com).
Obtaining and Installing Your VM Licenses

Make a note of the hardware IDs that you obtain during this procedure. Each of these unique Hardware ID values can be associated with a VM Registration Number from your Contract Notification email.

1. After the VM starts, open a terminal session for the VM and open the NIOS command line.
2. Run the command `show hwid`.
   
   nios-vm-ib-1420-gm > show hwid
   Hardware ID: 564d41e13a1cc55affb9bad4e3b5c48a
   Copy and paste the Hardware ID value for convenience.
   
   You can also run a `show license` command to obtain the same information:
   
   nios-vm-ib-1420-gm > show license
   
   Version : 6.11.0-248090
   Hardware ID : 564d41e13a1cc55affb9bad4e3b5c48a
   
   Note: If a license key is installed for the current VM, that key value also appears in the output for the `show license` command.

3. Go to https://support.infoblox.com/app/licenses (you will have to log in with your support account and click theLicenses menu). On the Licenses page, open Submit a license key registration form.
4. Enter or copy and paste the Hardware ID value you obtained in Step 2 of this procedure, in both fields:
   - Serial Number
   - Hardware ID
   Both values are synonymous.
5. Under the Service and Maintenance categories, select the check boxes for all options for which you have purchased service licenses and/or maintenance licenses.
6. Enter any Comments if needed.
7. Click Submit to submit the request for your license keys.
8. Repeat the previous steps for all other NIOS VM instances.

Infoblox Technical Support normally processes license key requests on the same day they are received; however, allow 24-48 hours for processing. When you receive the license keys, follow the steps in the procedure Managing Licenses in the NIOS Administrator Guide to install the licenses in the NIOS VM.

Note: Each VM Registration Number should have a Hardware ID associated with it. As you install and spin up each virtual machine, establish written records for each Hardware ID with the VM Registration Numbers in a one-to-one ratio. These value pairs are necessary should you need to contact Infoblox Support.

Obtaining License Keys for Existing VM Instances

If you are unsure of the license entitlements for one or more of your NIOS VMs, or want to obtain a new listing of your license keys for any reason, do the following:

1. Go to https://support.infoblox.com/app/licenses (you will have to log in with your support account and click the Licenses menu). On the Licenses page, open Download License Key(s) for one appliance.
   
   This feature recognizes that any VM is likely to have multiple feature licenses, all of which are tied to a specific Hardware ID.
2. Enter the Hardware ID number in the Enter one number: field. An example:

   ![Image of license key selection]

   Note that serial numbers and Hardware IDs are the same value.
3. Select how your license key will be provided:
4. After making your selection, click **Generate Keys** at the bottom of the panel. An example:

### Licenses

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Hardware ID</th>
<th>Entitlement</th>
<th>Expire Date</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>123456</td>
<td>123456-123456</td>
<td>DHCP</td>
<td>2017-04-20</td>
<td>GwAAAAPTTiCcwDNj0O4nyOTGdFZ7pot6WQ2XOSiqisg==</td>
</tr>
<tr>
<td>123456</td>
<td>123456-123456</td>
<td>DNS</td>
<td>2017-04-20</td>
<td>GwAAAAPTTiCcwDNj0O4nyOTGdFZ7pot6WQ2XOSiqisg==</td>
</tr>
<tr>
<td>123456</td>
<td>123456-123456</td>
<td>Grid</td>
<td>2017-04-20</td>
<td>GwAAAAPTTiCcwDNj0O4nyOTGdFZ7pot6WQ2XOSiqisg==</td>
</tr>
<tr>
<td>123456</td>
<td>123456-123456</td>
<td>NIOS Maintenance</td>
<td>2017-04-20</td>
<td>GwAAAAPTTiCcwDNj0O4nyOTGdFZ7pot6WQ2XOSiqisg==</td>
</tr>
</tbody>
</table>

5. After you receive your key values (there will likely be more than one for each VM), you can save them for your records. If you need to install a specific license or licenses, use the method you prefer as described in the Managing Licenses section in the NIOS Administrator Guide; either pasting in the license data, or uploading the CSV file.

### Running the Show License Command

You can also run a **show license** command to obtain the same information for an individual VM, which also indicates the license types for the VM:

```
show license
```

Example:

```
nios-vm-ib-1420-gm > show license
Version : 6.11.0-248090
Hardware ID : 564d41e13a1cc55affb9bad4e3b5c48a License Type : Grid Maintenance
Expiration Date : 04/20/2017
License String : GwAAAAPTTiCcwDNj0O4nyOTGdFZ7pot6WQ2XOSiqisg==
```

If license keys are installed for the current VM, those key values also appears in the output for this command listed for each license entitlement.

### Downloading License Keys for Multiple VM Instances

The Support pages provide a method for downloading the license keys for multiple VM instances, based on the purchased feature licenses for your products:

1. Obtain the Hardware ID values by following steps 1–3 in the previous procedure, **Obtaining and Installing Your VM Licenses**, for each of your VMs. Do this in the order shown from top to bottom of your Contract Notification email.

As an alternative, you may use the VM Registration Numbers in your Contract Notification email, also separated by commas.

2. Go to [https://support.infoblox.com/app/licenses](https://support.infoblox.com/app/licenses) (you will have to log in with your support account and click the **Licenses** menu). On the Licenses page, open **Download License Key(s)** for multiple appliances.

3. Enter (or copy and paste) each of the Hardware ID values or VM Registration Numbers into the entry field, each in its own row, with a comma at the end of each value. Do not press Return between each value. An example, using VM Registration Numbers:
4. Click **Generate Keys** at the bottom of the panel (you may need to scroll down to show it). The list of keys may be quite substantial. The list shows the license entitlements and registration keys for all NIOS VMs that are purchased and listed with Infoblox Support.

5. After you receive your key values, you can save them for your records. If you need to install a specific license or licenses, you can use the method you prefer as described in the section **Managing Licenses** in the *Infoblox NIOS Administrator Guide*; either pasting in the license data, or uploading the CSV file.
Configuring the Virtual NICs

In this section, you configure the virtual NICs for your NIOS virtual appliance. You can configure settings for up to four discrete virtual interfaces, NIOS requires a minimum of two interfaces to operate in a VM. The four interfaces mirror the MGMT, LAN1, HA, and LAN2 port configurations for hardware NIOS appliances. All the network adapters must be of the same Adapter type. The NIOS virtual instance performs best with the VMXNET 3 network adapter type, but also supports VMXNET 2 adapter type for backwards compatibility. To improve performance and reduce overhead, consider to migrate all the legacy VMXNET 2 network adapter type to VMXNET 3.

1. From the vSphere Client, select the newly deployed NIOS virtual instance.
2. Click Inventory -> Virtual Machine -> Edit Settings.
3. In the Virtual Machine Properties dialog box, select the Hardware tab.
4. From the Hardware list, select one of the following based on the configuration of your NIOS virtual machine. For a NIOS virtual HA pair, you must configure both the LAN1 and HA ports for the virtual nodes.
   - **Network Adapter 1**: MGMT
   - **Network Adapter 2**: LAN1
   - **Network Adapter 3**: HA
   - **Network Adapter 4**: LAN2
5. For each network adapter, select the network of the NIOS virtual instance from the Network Connection drop-down menu. The list includes all networks configured for virtual machines on the host, as shown in Figure 2.4.
6. Click OK.

**Figure 2.4 Virtual NIC Configuration**
Chapter 3 Configuring SRE-V Service Module to Install NIOS Virtual Appliance

This chapter provides general information about the configuration of Cisco SRE-V service module. It also describes how to install NIOS virtual appliance after configuring Cisco SRE-V. This chapter includes the following topic:

- Configuring the SRE-V Service Module and Installing the NIOS Virtual Software
Configuring the SRE-V Service Module and Installing the NIOS Virtual Software

These instructions assume that you have configured the ISR router on your network, and you are able to connect to the ISR router from your management station. For information about configuring the ISR router, refer to the Cisco documentation.

This section describes how to configure the Cisco SRE-V service module to host the NIOS virtual software package, including how to install the software package. The Cisco SRE-V service module uses the following interfaces to communicate with the host router: Console Manager interface, MGF (Multi-Gigabit Fabric) interface, and External Service Module interface. For information about interfaces, refer to the Cisco documentation.

Infoblox recommends that you back up your existing configuration before proceeding. Complete the following tasks on the ISR router:

1. Connect to the ISR router. You must install the Cisco SRE-V service module on the router. Ensure that the Cisco router is running the appropriate Cisco IOS version and recognizes the Cisco SRE-V service module. Configure the internal interfaces between the Cisco SRE-V service module and the host router. This will allow you to access the service module to install and configure the Cisco SRE-V application. For information, refer to the Cisco documentation.

In the following example, the router is a Cisco 3845 ISR, the gigabit Ethernet interface IP address is 10.34.28.2 with a /24 netmask, and the IP address of the SRE-V service module is 10.34.28.10.

Enter installation commands as mentioned below:

```
Router# enable
service-module sm 1/0 install url ftp://server.com/dir/sre-v-k9.smv.1.0.1.pkg service-module sm 1/0 status
exit

Enter the following configuration commands, one per line. End with CNTL/Z.

Router(config)# configure terminal
Configure SM1/0 of the Console Manager:
Router(config)# interface SM1/0
Router(config-if)# interface unnumbered gigabitEthernet0/0
Router(config-if)# no service-module ip default-gateway
Router(config-if)# no service-module ip address
Router(config-if)# ip address 10.34.28.10 255.255.255.0
Router(config-if)# service-module ip address 10.34.72.18 255.255.255.192
Router(config-if)# service-module ip default-gateway 10.35.1.161
Router(config-if)# write
Router(config-if)# no shutdown
Router(config)# exit

Application: SRE-V Running on SMV:
Router(config-if)# service-module ip default-gateway 10.34.72.16
Router(config-if)# service-module mgf ip address 10.34.72.68 255.255.255.192
Router(config-if)# service-module mgf ip default-gateway 10.34.72.66
Router(config-if)# no keepalive
Router(config)# exit

Configure SM1/1 of the Console Manager:
Router(config-if)# interface SM1/1
Router(config)# exit

Router(config)# ip route 10.34.72.18 255.255.255.255 SM1/0
Router(config)# ip route 10.34.72.68 255.255.255.255 Vlan1
Router(config)# ip route 10.34.72.70 255.255.255.255 Vlan1
Router(config)# exit

Internal switch interface connected to Service Module
Router(config-if)# switchport mode trunk
Router(config-if)# no keepalive
Router(config-if)# hold-queue 60 out
Router(config)# exit

Configure VLAN1:
Router(config-if)# interface Vlan1
Router(config-if)# ip unnumbered GigabitEthernet0/1
Router(config-if)# ip default-gateway 10.36.0.1
Router(config-if)# ip forward-protocol nd
Router(config-if)# ip http server
Router(config-if)# ip http access-class 23
Router(config-if)# ip http authentication local
Router(config-if)# ip http secure-server
```
Router(config-if)# ip http timeout-policy idle 60 life 86400 requests 10000
Router(config-if)# ip route 0.0.0.0 0.0.0.0 10.36.0.1
Router(config-if)# exit

Note: If the router is not directly connected to the network, configure the switch to which it is connected to forward the broadcast packets to the SRE-V service module.

2. Download vSphere Client from https://hypervisor-ip-address, and then click Run. The VMware vSphere Client is installed on your system. You can click the VMware vSphere Client icon to open the login window.

3. To manage a single VMware vSphere Hypervisor™, enter the IP address or hostname of the VMware vSphere Hypervisor™ and the username and password, and then click Login. The vSphere Client GUI opens.

Note: If you are a first-time user of the VMware vSphere Hypervisor™, use esx-admin for the user name and change_it for the password. Infoblox highly recommends that you change the default password after the initial reboot.

4. Check the software packages installed on the SRE-V service module. Ensure that SRE-V OS 15.1(3) T is installed before you install the NIOS virtual software package.

   The following example shows how to check the software packages installed on an SRE-V service module.

cisco-member.infoblox.com>show software packages
Installed Packages:
- Installer (Installer application) (1.5.2.0)
- vserialapi (Remote Serial Device support) (1.5.2)
- eventapi (IOS Event API) (1.5.2)
- Bootloader (Primary) (Service Engine Bootloader) (2.1.16)
- SRE-V (Services-Ready Engine - Virtualization)
- Infrastructure (Service Engine Infrastructure) (2.5.6.0)
- Global (Global manifest) (1.5.2)
- ios_mosipc (Cisco Multi-OS IPC support) (1.52.OMNI_TAHOE_20091104_PLUS_@_DT_REL)
- iosapi (IOS CLI API) (1.5.2)
- cli_plugin (CLI Plugin bundle to allow custom CLI plugin) (1.5.2)
- GPL Infrastructure (Service Engine GPL Infrastructure) (2.3.6.0)
- Bootloader (Secondary) (Service Engine Bootloader) (2.1.16.0)
- Core (Service Engine OS Core) (2.5.6.0)
- timezone (Time Zone Definitions) (1.0.2009g.1)
- ios_snap (Structured Network API Support)(1.5.2.SNAP_REL_20091209)
Installed Plug-ins:
- infoblox (Infoblox Virtual NIOS) (1.5.2)
- app_dev (Application Debugging Add-on Package) (1.5.2)

   Install the vNIOS software package that you downloaded from the Infoblox Technical Support site. Ensure that you downloaded the appropriate vNIOS software package for your SRE-V service module. There is a vNIOS software package for SRE-V modules.

5. The installation process takes about five minutes. After the installation is complete, the appliance displays the following message:

   Infoblox started successfully
Chapter 4 Joining NIOS Virtual Appliances to the Grid

This chapter provides general information about the Infoblox NIOS virtual appliance and Infoblox Grids. It also describes how to set up a Grid and how to configure the NIOS virtual appliance as Grid members. It explains how to transfer licenses between NIOS virtual appliances. This chapter includes the following topics:

- About Infoblox Grids
- Setting Up a Grid
- Configuring NIOS Virtual Appliances as Grid Masters
  - Specifying Initial Settings on NIOS Virtual Grid Masters
  - Configuring the NIOS Virtual Appliance as a Grid Master
- Configuring NIOS Virtual Appliances as Grid Members
  - Provisioning NIOS Virtual Members on the Grid Master
  - Configuring and Joining NIOS Virtual Grid Members
- Transferring NIOS Virtual Licenses
  - Obtaining Replacement NIOS Virtual Licenses
  - Installing New NIOS Virtual Licenses
  - Configuring HA Pairs for License Transfers
  - Removing NIOS Virtual Appliances from the Grid
- Migrating NIOS Virtual Appliances
- Verifying and Monitoring
About Infoblox Grids

An Infoblox Grid is a group of two or more NIOS and NIOS virtual appliances that share sections of a common, distributed, built-in database and which you configure and monitor through a single, secure point of access: the Grid Master. A Grid consists of a Master and at least one member. A Grid member can be a single appliance or an HA pair. For information about HA pairs, refer to the Infoblox NIOS Administrator Guide. Figure 4.1 illustrates a Grid with a NIOS virtual Grid Master, a NIOS virtual Grid Master candidate, and NIOS and NIOS virtual Grid members. In the illustration, the Grid Master and the Grid Master candidate are NIOS virtual HA pairs in the data center. The NIOS and NIOS virtual Grid members are in branch offices. Smaller sites can consolidate the NIOS virtual appliances and other virtual applications on one virtualization server. They can manage the Grid members from one central location, the Grid Master.

Setting Up a Grid

Figure 4.1 Infoblox Grid with NIOS Virtual Grid Master and Grid Members

To create a Grid, you must first set up a Grid Master and then add members. In a Grid, you can configure NIOS virtual appliances as Grid Masters, Grid Master candidates, and Grid members.

To set up a Grid:

1. Configure the Grid Master. You can configure a NIOS virtual appliance as a single Grid Master or as an HA Grid Master. To configure a NIOS virtual appliance as a Grid Master, you must first deploy the NIOS virtual appliance, and then configure it. When you configure an HA Grid Master using two NIOS virtual instances, ensure that you use the same NIOS virtual models for the Active and passive nodes. For more information, see Configuring the NIOS Virtual Appliance as a Grid Master.
2. Provision Grid members on the Grid Master. Define Grid member settings on the Grid Master before you join the members to the Grid. For information, see Provisioning NIOS Virtual Members on the Grid Master.
3. Join members to the Grid. For information, see Configuring and Joining NIOS Virtual Grid Members.
Configuring NIOS Virtual Appliances as Grid Masters

After you deploy a NIOS virtual appliance on the VMware platform, you can configure it as a single or an HA Grid Master. To configure a NIOS virtual HA Grid Master, deploy two NIOS virtual appliances and define the network settings for each node. The procedure is the same as joining two physical appliances as an HA pair. You must configure a Grid Master and set up the Grid before you join Grid members. For more information about configuring HA pairs, refer to the Infoblox NIOS Administrator Guide.

To configure a NIOS virtual appliance as a Grid Master:

1. Deploy the NIOS virtual appliance, as described in Deploying NIOS Virtual Appliances on VMware.
2. Specify initial settings on the NIOS virtual appliance, as described in Specifying Initial Settings on NIOS Virtual Grid Masters.
3. Configure the NIOS virtual appliance as a Grid Master, as described in Configuring the NIOS Virtual Appliance as a Grid Master. For an HA Grid Master, ensure that you follow the procedures to configure node 2 of the HA pair.

Specifying Initial Settings on NIOS Virtual Grid Masters

After you successfully install the NIOS virtual appliance and start the NIOS virtual appliance, connect to the NIOS CLI and specify the initial settings. For an HA Grid Master, ensure that you specify the initial settings on both nodes.

1. From the vSphere Client, select the NIOS virtual instance.
2. Select the Console tab.
3. Click anywhere in the console screen to activate the console.
4. When the Infoblox login prompt appears, log in with the default user name and password.

   login: admin
   password: infoblox

   The Infoblox prompt appears: Infoblox >

5. You must have valid licenses before you can configure the NIOS virtual appliance. To obtain permanent licenses, first use the show version command to obtain the serial number of the NIOS appliance, and then visit the Infoblox Support web site at https://support.infoblox.com. Log in with the user ID and password you receive when you register your product online at: https://www.infoblox.com/support/customer/evaluation-and-registration.

   If the NIOS virtual appliance does not have the Infoblox licenses required to run NIOS services and to join a Grid, you can use the set temp_license command to generate and install a temporary 60-day license. The appliance lists the available licenses, and you select those you need.

   Infoblox > set temp_license
   1. DNSone (DNS, DHCP)
   2. DNSone with Grid (DNS, DHCP, Grid)
   3. Network Services for Voice (DHCP, Grid)
   4. Add DNS Server license
   5. Add DHCP Server license
   6. Add Grid license
   7. Add Microsoft management license
   8. Add vnIOS license
   9. Add IF-MAP Federation license
   10. Add Multi-Grid Management license
   11. Add Query Redirection license
   12. Add Load Balancer license
   Select license (1-12) or q to quit:

   For the vnIOS appliance, select 2 and 8.

   Note: You must have both the Grid and NIOS virtual licenses for the NIOS virtual appliance to join a Grid.

6. Use the CLI command set network to configure the network settings. Infoblox > set network

   Infoblox > set network
   NOTICE: All HA configurations are performed from the GUI. This interface is used only to configure a standalone node or to join a Grid.
   Enter IP address: 10.1.1.22
   Enter netmask: [Default: 255.255.255.0]: 255.255.255.0
   Enter gateway address [Default: 10.1.1.1]: 10.1.1.1
   Become Grid member? (y or n): n

Configuring the NIOS Virtual Appliance as a Grid Master

You configure the NIOS virtual appliance as a Grid Master using the Grid Setup wizard. If you are configuring a NIOS virtual HA Grid Master, you complete the configuration for each virtual node in the HA pair as described in this section.

To configure the single Grid Master or node 1 of the HA Grid Master:

1. On your management system, open a new browser window, and connect to https://ip_addr, where ip_addr is the address of the single appliance or LAN1 port on node 1.
2. Log in using the default user name admin and password infoblox.
3. Review the End-User License Agreement and click I Accept.
4. In the Grid Setup wizard, select Configure a Grid Master and click Next.
5. Complete the following to specify the Grid properties, and then click Next:
   - Grid Name: Enter a text string, such as DaveyJones, that the Grid Master and appliances joining the Grid use to authenticate each other when establishing a VPN tunnel between them. The default Grid name is Infoblox.
   - Shared Secret: Enter a text string, such as Lock37, that the Grid Master and appliances joining the Grid use as a shared secret to authenticate each other when establishing a VPN tunnel between them. The default shared secret is test.
   - Show Password: Select this to display the password. Clear the check box to conceal the password.
   - Hostname: Enter a valid domain name for the appliance. You can use the name that you entered for the NIOS virtual appliance when you deployed it.
   - Is the Grid Master an HA pair?: Select No for the single Grid Master. Select Yes for an HA pair.
6. Complete the following to configure the network settings, and then click Next:
   - Host Name: Enter a valid domain name for the appliance.
   - IP Address: Displays the IP address of the LAN port.
   - Subnet Mask: Displays the subnet mask of the LAN port.
   - Gateway: Displays the IP address of the gateway of the subnet on which the LAN port is set.
   - Port Settings: The default is Automatic. You cannot change port settings for NIOS virtual appliances.
7. For an HA pair, complete the following to specify the network properties and click Next:
   - Virtual Router ID: Enter the VRID (virtual router ID). This must be a unique VRID number—from 1 to 255—for this subnet.
   - Required Ports and Addresses: Enter information about the following virtual interfaces: VIP, Node 1 HA and LAN ports, Node 2 HA and LAN ports. The VIP address and the IP addresses for all the ports must be in the same subnet. Enter the IP address of the gateway for the subnet on which the interfaces are set. This is the same for all interfaces. All fields are required. Note that you cannot change the port settings.
8. Optionally, enter a new password and click Next. The password must be a single hexadecimal string (no spaces) that is at least four characters long.
9. Select the time zone of the Grid Master and indicate whether the Grid Master synchronizes its time with an NTP (Network Time Protocol) server, and then click Next.
   - If you choose to enable NTP, click the Add icon and enter the IP address of an NTP server. You can enter IP addresses for multiple NTP servers.
   - If you choose to disable NTP, set the date and time for the appliance.
10. The last screen displays the settings you specified in the previous panels of the wizard. Verify that the information is correct and click Finish. The application restarts after you click Finish.

Note: The Grid Setup wizard provides options such as not changing the default password and manually entering the time and date. However, changing the password and using an NTP server improve security and accuracy (respectively), and so these choices are presented here.
Record and retain this information in a safe place. If you forget the shared secret, you need to contact Infoblox Technical Support for help. When you add an appliance to the Grid, you must configure it with the same Grid name, shared secret, and VPN port number that you configure on the Grid Master.

The last screen of the setup wizard states that the changed settings require the appliance to restart. When you click Finish, the appliance restarts.

For an HA pair, complete the following to configure node 2 using the Grid Setup wizard:

1. On your management system, open a new browser window, and connect to https://ip_addr, where ip_addr is the address of the LAN1 port on node 2.
2. Log in using the default user name and password admin and infoblox.
3. Review the End-User License Agreement and click I Accept.
4. In the Grid Setup wizard, select Join Existing Grid and click Next.
5. Complete the following to specify the Grid properties and click Next
   - Grid Name: Enter the Grid name you entered for node 1.
   - Grid Master’s IP Address: Enter the VIP you entered for node 1.
   - Shared Secret: Enter the shared secret you entered for node 1.
6. Verify the IP address settings of the member and click Next.
7. The last screen displays the settings you specified in the previous panels of the wizard. Verify that the information is correct and click Finish.

The setup of the HA Grid Master is complete. If the two nodes cannot join (it should not take more than a few seconds), check the IP addresses of Node 1 LAN and Node 1 HA (the Grid Master) and for Node 2 LAN and Node 2 HA (the node attempting to join the Grid Master to form the HA Pair). Ensure that the network IP address of node 2 is set to the same value as Node 2 LAN on the Grid Master.
As a method of verifying successful communication, open the console window for node 2. You should see a pair of messages as follows:
Contacting the Grid Master at 10.36.0.200....
Synchronizing database with the Grid Master....
For more information about HA pair configurations, refer to the Infoblox NIOS Administrator Guide.
Configuring NIOS Virtual Appliances as Grid Members

You can configure a NIOS virtual appliance as a single Grid member, or two NIOS virtual appliances as a NIOS virtual HA Grid member. To configure a NIOS virtual HA Grid member, deploy two NIOS virtual appliances and define the network settings for each node. Connect to the Grid Master and specify the two NIOS virtual appliances as nodes in the HA pair. The procedure is the same as joining two physical appliances as an HA pair. You must configure a Grid Master and set up the Grid before you join Grid members. For information, see Setting Up a Grid.

To configure a NIOS virtual appliance as a Grid member:

1. Deploy the NIOS virtual appliance, as described in About Infoblox Grids.
2. Define the NIOS virtual appliance on the Grid Master, as described in Provisioning NIOS Virtual Members on the Grid Master.
3. Specify the initial settings and join the NIOS virtual appliance to the Grid, as described in Configuring and Joining NIOS Virtual Grid Members.

Provisioning NIOS Virtual Members on the Grid Master

Before you configure the individual appliances that you want to add to the Grid, you must first define them on the Grid Master, as follows:

1. Log in to the Grid Master.
2. From the Grid tab, select the Grid Manager tab -> Members tab, and then click Add -> Add Grid Member from the Toolbar.
3. In the Add Grid Member wizard, enter the following and click Next:
   - Member Type: Select Virtual NIOS.
   - Host Name: Type the FQDN (fully qualified domain name) of the NIOS virtual single or HA appliance that you want to add to the Grid.
   - Time Zone: If the NIOS virtual Grid member is in a different time zone from the Grid, click Override and select a time zone.
   - Comment: Enter useful information about the NIOS virtual appliance.
4. Enter the following information about the member that you want to add to the Grid and click Next: For a single Grid Member:
   - Standalone Member: Select this option.
   - Address: Type the IP address of the NIOS virtual Grid member.
   - Subnet Mask: Choose the netmask.
   - Gateway: Type the default gateway of the NIOS virtual Grid member.
   - Port Settings: The default is Automatic. You cannot change port settings for NIOS virtual appliances. For an HA Grid member:
     - High Availability Pair: Select this option.
     - Virtual Router ID: Enter a unique VRID number—from 1 to 255—for the local subnet.
     - Required Ports and Addresses: Enter information about the following virtual interfaces: VIP, Node 1 HA and LAN ports, Node 2 HA and LAN ports. The VIP address and the IP addresses for all the ports must be in the same subnet. Enter the IP address of the gateway for the subnet on which the interfaces are set. This is the same for all interfaces. All fields are required. Note that you cannot change the port settings.
5. Optionally, define extensible attributes. For information, refer to the Infoblox NIOS Administrator Guide.
6. Save the configuration and click Restart if it appears at the top of the screen.

Configuring and Joining NIOS Virtual Grid Members

After you successfully install the NIOS virtual appliance and start the NIOS virtual appliance, connect to the NIOS CLI and specify the initial settings. If you are configuring a NIOS virtual HA Grid member, you must complete the following steps for each virtual node in the HA pair.

1. Connect to the Grid Master where you can add the NIOS virtual appliance to the Grid.
2. From the vsphere Client, select the NIOS virtual instance.
3. Select the Console tab.
4. Click anywhere in the console screen to activate the console.
5. When the Infoblox login prompt appears, log in with the default user name and password.
   
   login: admin
   password: infoblox

   The Infoblox prompt appears: Infoblox >
6. You must have valid licenses before you can configure the NIOS virtual appliance. To obtain permanent licenses, first use the show version command to obtain the serial number of the NIOS virtual appliance, and then visit the Infoblox Support web site at https://www.infoblox.com/support. Log in with the user ID and password you receive when you register your product online at: https://www.infoblox.com/support/customer/evaluation-and-registration.

   If the NIOS virtual appliance does not have the Infoblox licenses required to run NIOS services and to join a Grid, you can use the set temp_license command to generate and install a temporary 60-day license. The appliance lists the available licenses and you select those you need.

   Infoblox > set temp_license
   1. DNSone (DNS, DHCP)
   2. DNSone with Grid (DNS, DHCP, Grid)
   3. Network Services for Voice (DHCP, Grid)
   4. Add DNS Server license
   5. Add DHCP Server license
   6. Add Grid license
   7. Add Microsoft management license
8. Add vNIOS license
9. Add IF-MAP Federation license
10. Add Multi-Grid Management license
11. Add Query Redirection license
12. Add Load Balancer license
Select license (1-12) or q to quit:

Note: You must have both the Grid and NIOS virtual licenses for the NIOS virtual appliance to join a Grid.

7. Set the network settings and join the NIOS virtual appliance to the Grid. Use the CLI command `set network` to configure the network settings and specify the Grid.

    Infoblox > set network
    NOTICE: All HA configurations are performed from the GUI. This interface is used only to configure a standalone node or to join a Grid.
    Enter IP address: 10.1.1.11
    Enter netmask: [Default: 255.255.255.0]: 255.255.255.0
    Enter gateway address [Default: 10.1.1.1]: 10.1.1.1
    Become Grid member? (y or n): y
    Enter Grid Master VIP: 10.1.1.22
    Enter Grid Shared Secret: L0ck37
    Join Grid as member with attributes:
    Join Grid Master VIP: 10.1.1.22
    Grid Name: DaveyJones
    Grid Shared Secret: L0ck37
    WARNING: Joining a Grid will replace all the data on this node!
    Is this correct? (y or n): y
    Are you sure? (y or n): y
    The network settings have been updated.
Transferring NIOS Virtual Licenses

In a Grid, you can transfer the valid licenses of a NIOS virtual appliance from one ESX/ESXi server to another without going through the RMA (returned materials authorization) process. You can also transfer licenses from one independent NIOS virtual appliance to another. Before you transfer licenses, obtain new license keys through the Infoblox Support web site. The new licenses replace the original ones. Note that when you replace licenses on NIOS virtual appliances, service interruptions can occur.

Note: Once licenses are removed from a NIOS virtual appliance, the appliance can no longer join the Grid. You must remove the appliance from the Grid and stop using it.

Complete the following to transfer NIOS virtual licenses from one NIOS virtual appliance to another:

1. Obtain replacement license keys from Infoblox, as described in Obtaining Replacement NIOS Virtual Licenses.
2. Install the new licenses on the new NIOS virtual appliance, as described in Installing New NIOS Virtual Licenses.
   or
   As a best practice to minimize service downtime, you can set up an HA pair and force a failover during a license transfer. For information, see Configuring HA Pairs for License Transfers.
3. Remove the original NIOS virtual appliance from the Grid, as described in Removing NIOS Virtual Appliances from the Grid. You can skip this step for independent NIOS virtual appliances.
4. Shut down the original NIOS virtual appliance.
5. Verify that all licenses are now current. For information, see Verifying and Monitoring.

After you transfer NIOS virtual licenses, you can view information about the new and replaced licenses from Grid Manager. Though you can transfer licenses among NIOS virtual appliances more than once, Grid Manager displays information about the first license transfer only. For more information about managing and viewing licenses, refer to the Infoblox NIOS Administrator Guide. You can also use the CLI command show license revoked to view information about the replaced licenses. For information, refer to the Infoblox CLI Guide.

Obtaining Replacement NIOS Virtual Licenses

To obtain replacement license keys for your NIOS virtual appliance, do the following:

2. Click License Key in the left panel.
3. In the Software Licensing Tools panel, select vNIOS for VMware License REVOCATION.
4. On the Virtual Appliance License Key page, complete the following:
   • Existing Appliance Serial Number: Enter the hardware ID of the NIOS virtual appliance that you want to replace.
   • New Appliance Serial Number: Enter the hardware ID of the new NIOS virtual appliance. Select one of the following:
   • Display to Screen: Select this to display the license keys on the screen.
   • Send to file: Select this to receive a license file that contains the new license keys.
   • CSV text: Select this to receive the license keys in CSV format.
5. Click Generate Key.

Infoblox generates new license keys for your new NIOS virtual appliance.

Installing New NIOS Virtual Licenses

To install replacement licenses on a NIOS virtual appliance, do the following:

1. Configure the new NIOS virtual appliance and join it to the Grid if it is not already in the Grid, as described in Configuring and Joining NIOS Virtual Grid Members.
2. Log in to the Grid Master GUI.
3. From the Grid -> Licenses tab, click the Add icon and complete the following to add the new license keys:
   • Upload License File: Click Select File and navigate to the new license file you obtained from Infoblox.
   • Paste License(s): Paste the license keys in this text field. You must paste the entire string in CSV format: serial number, hardware ID, license type, end date, and license string. If you are pasting multiple licenses, start each string on a new line.
   You can also use the CLI command set license to install the new licenses. For information, refer to the Infoblox CLI Guide.
4. Click Save License(s).

Grid Manager displays a confirmation dialog box listing information (license type, license string, and hardware ID) about the member you want to replace and asks if you want to continue. Click OK to install the licenses on the new member, or click Cancel to cancel the operation.

The new licenses automatically replace the old ones, and the replaced NIOS virtual appliance is evicted from the Grid.
5. Remove the replaced appliance from the Grid, as described in Removing NIOS Virtual Appliances from the Grid.

Configuring HA Pairs for License Transfers

To minimize service downtime during a NIOS virtual license transfer, do the following:

1. Create an HA member. Configure the existing NIOS virtual appliance as the active node. Install temporary licenses on the new NIOS virtual appliance and configure it as the passive node, as described in Configuring and Joining NIOS Virtual Grid Members. For more
1. Information about how to configure an HA pair, refer to the Infoblox NIOS Administrator Guide.

2. Provision the HA member on the Grid Master and rejoin the HA member to the Grid so the passive node can synchronize with the Grid Master. For information, see Provisioning NIOS Virtual Members on the Grid Master.

3. Reboot the active node to force a failover on the HA pair. The new NIOS virtual appliance now becomes the active node.

4. Log in to the Grid Master GUI.

5. From the Grid -> Licenses tab, click the Add icon and complete the following to add the new license keys to the HA pair:
   - **Upload License File**: Click Select File and navigate to the new license file you obtained from Infoblox.
   - **Paste License(s)**: Paste the new license keys in this text field. You must paste the entire string in CSV format. Note that the new license key is longer because it contains the hardware ID of the existing NIOS virtual appliance.

     You can also use the CLI command set license to install the new licenses. For information, refer to the Infoblox CLI Guide.

6. Click **Save License(s)**. Grid Manager displays a confirmation dialog box listing information (license type, license string, and hardware ID) about the member you want to replace and asks if you want to continue. Click **OK** to install the licenses on the new member, or click **Cancel** to cancel the operation.

   The new licenses automatically replace the old ones, and the passive node is evicted from the Grid.

7. Remove the replaced appliance from the Grid, as described in Removing NIOS Virtual Appliances from the Grid.

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**Removing NIOS Virtual Appliances from the Grid**

1. From the Grid -> Grid Manager -> Members tab, select the appliance whose licenses were removed. Grid Manager displays a license violation warning for this appliance, as shown in Figure 4.4.

2. Click the **Delete** icon to remove the appliance from the Grid.

   You can also log in to the NIOS virtual appliance whose licenses are being replaced, and then use the CLI command `reset licenses all` to reset the licenses and remove the appliance from the Grid.

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**Note**: You must stop using the virtual appliance and remove it from the Grid once its licenses are replaced.
Migrating NIOS Virtual Appliances

You can use the VMware vMotion feature to migrate a NIOS virtual appliance from one ESX or ESXi server to another. To migrate a NIOS virtual appliance using vMotion:

1. From the vSphere Client, right-click the NIOS virtual appliance you want to migrate.
2. Select Migrate....
3. In the Migrate Virtual Machine dialog box, select Change Host.
4. In the Select Destination dialog box, select the ESX or ESXi server to which you want to migrate the NIOS virtual appliance.
5. Click Next, and then click Finish to complete the migration.
Verifying and Monitoring

After you configure the NIOS virtual appliance, you can check its status on the Dashboard and in the Grid -> Grid Manager -> Members tab, as shown in Figure 4.2 and Figure 4.3.

**Figure 4.2 NIOS Virtual Appliance Status on the Dashboard**

![Grid Status](image1)

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**Figure 4.3 NIOS Virtual Appliance Status in the Members Tab**

![Members Tab](image2)

After a license transfer, you must remove the NIOS virtual appliance whose licenses are replaced. Grid Manager displays a license violation warning for this member if it is still operational, as shown in Figure 4.4. You must immediately remove this member from the Grid and stop using the appliance until you obtain valid licenses for it.

**Figure 4.4 A NIOS Virtual Appliance with Invalid Licenses after a License Transfer**

![License Violation Warning](image3)
The appliance displays a license violation warning if you do not remove the NIOS virtual appliance that has invalid licenses after a license transfer.

In the Grid -> Licenses tab, you can view information about licenses that are being replaced, as shown in Figure 4.5. The Replaced Hardware ID column displays the hardware ID of the NIOS virtual appliance whose licenses are being replaced. Note that the hardware IDs of the licenses that are being replaced are highlighted in red.

Figure 4.5 Information about Replaced Licenses
Appendix A Known Limitations

NIOS virtual appliance for VMware support most of the features of the Infoblox NIOS appliances, with the following limitations:

- When you configure an HA pair, both nodes in the HA pair must be NIOS virtual instances. You cannot configure a physical NIOS appliance and a NIOS virtual instance in an HA pair.
- NIOS virtual appliances run on virtual hardware. They do not have sensors to monitor the physical CPU temperature, fan speed, and system temperature.
- Changing the NIOS virtual appliance settings through the VMware vSphere or vCenter console may violate the terms of the NIOS virtual licensing and support models. The NIOS virtual appliance may not join the Grid or function properly.
Customer Care

This section addresses user accounts, software upgrades, licenses and warranties, and technical support.

User Accounts

The Infoblox appliance ships with a default user name and password. Change the default admin account password immediately after the system is installed to safeguard its use. Make sure that the NIOS appliance has at least one administrator account with superuser privileges at all times, and keep a record of your account information in a safe place. If you lose the admin account password, and did not already create another superuser account, the system will need to be reset to factory defaults, causing you to lose all existing data on the NIOS appliance. You can create new administrator accounts, with or without superuser privileges.

Software Upgrades

Software upgrades are available according to the Terms of Sale for your system. Infoblox notifies you when an upgrade is available. Register immediately with Infoblox Technical Support at http://www.infoblox.com/support/customer/evaluation-and-registration to maximize your Technical Support.

Technical Support

Infoblox Technical Support provides assistance via the Web, e-mail, and telephone. The Infoblox Support web site at https://support.infoblox.com provides access to product documentation and release notes, but requires the user ID and password you receive when you register your product online at: http://www.infoblox.com/support/customer/evaluation-and-registration.
Specifying Initial Settings on vNIOS Grid Masters

- Configuring the vNIOS Virtual Appliance as a Grid Master
- Configuring vNIOS Appliances as Grid Members
- Provisioning vNIOS Members on the Grid Master
- Configuring and Joining vNIOS Grid Members
- Transferring vNIOS Licenses
  - Obtaining Replacement vNIOS Licenses
  - Installing New vNIOS Licenses
Starting your vNIO Virtual Appliance using vSphere Client

- **Obtaining and Installing Your VM Licenses**
  - Obtaining License Keys for Existing VM Instances
  - Running the Show License Command