Infoblox Installation Guide vNIOS for Google Cloud Platform
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Product Information


Warranty Information

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Introduction

This section provides information about the Infoblox vNIOS for GCP (Google Cloud Platform) virtual appliance and explains how to deploy it in the GCP Public Cloud.

Infoblox vNIOS for GCP is a virtual Infoblox appliance designed to operate in the GCP VPC (Virtual Private Cloud) network. For more information about GCP, refer to the Google Cloud Platform documentation at https://cloud.google.com/docs.

This section includes the following topics:

- About Infoblox vNIOS for GCP
- Supported Deployment Methods for Infoblox vNIOS for GCP
- Prerequisites
- Supported vNIOS for GCP Models
About Infoblox vNIOS for GCP

Infoblox vNIOS for GCP is an Infoblox virtual appliance that enables you to deploy robust, manageable, and cost-effective Infoblox appliances in the Google Cloud. Infoblox vNIOS provides core network services and a framework for integrating all the components of the modular Infoblox solution. It provides integrated, secure, and easy-to-manage DNS (Domain Name System) and IPAM (IP address management) services. For more information about the Infoblox Grid, DNS, and IPAM, refer to the Infoblox NIOS Documentation.

You can use Infoblox vNIOS for GCP virtual appliances to provide enterprise-grade DNS and IPAM services across your GCP VPCs. Instead of manually provisioning IP addresses and DNS name spaces for network devices and interfaces, you can deploy an Infoblox vNIOS for GCP instance as one of the following:

- A standalone NIOS appliance to provide DNS services in your Google VPC.
- A virtual cloud member tied to an on-premises (non-Cloud) NIOS Grid.
- A Grid Master synchronizing with other GCP-hosted vNIOS Grid members in your Google VPC, and across VPCs or Zones in different regions.

Infoblox vNIOS for GCP fully supports automated allocations of IP addresses and DNS record creation for business workloads. You can reduce provisioning errors and quickly provision and de-commission resources in your public cloud. NIOS handles all IP address management of GCP instances as well as provisioning and managing all private IP addresses through IPAM.

Infoblox vNIOS for GCP deployments may be part of a hybrid cloud strategy that supports managing organization assets on public clouds (For example Amazon) and on private clouds (For example OpenStack and VMware). You use the Grid Manager as a unified console to support all Cloud platforms, to ensure uniform DNS policies, and to provision network and IP addresses.
Supported Deployment Methods for Infoblox vNIOS for GCP

You can deploy one or more Infoblox vNIOS for GCP instances in your Google VPC, automatically provision them to join the NIOS Grid, and manage your Google VPC DNS services through the Infoblox NIOS Grid Manager.

Supported deployment methods for Infoblox vNIOS for GCP include the following:

- Run NIOS Grid members or Grid Masters in the GCP public cloud with secure connectivity and synchronization with Infoblox NIOS Grids in on-premises private networks or in a hybrid public cloud/on-premises private cloud configuration.
- Run an entire NIOS Grid in your Google VPC.
- Support large-scale deployments spanning dozens of Google VPCs.
- Use elastic scaling for flexible management of NIOS appliance licensing features across the entire Grid, including Cloud Management Platform (CMP) integration. Elastic Scaling enables automatic deployment of Infoblox vNIOS for GCP instances in your Google VPC.
- DNS zone transfers to keep VPC-based Infoblox vNIOS for GCP instances in synchronization with the on-premises NIOS Grid.
- Infoblox vNIOS for GCP is compatible with standard operations in the GCP environment.
Prerequisites

Before deploying vNIOS for GCP, ensure that you have completed the following:

- Set up a GCP account and create a project, if none already exists.
- If you want to join the vNIOS for GCP instance to the on-prem Grid, Configure an on-premise Infoblox Grid or Grid Master. For more information, refer to the Infoblox NIOS Documentation.
- Install the GCP CLI utility to perform CLI based operations. For more information, see https://cloud.google.com/sdk/gcloud/.
Supported vNIOS for GCP Models

This section lists the supported vNIOS for GCP appliance models for different NIOS releases.

The following table lists the vNIOS for GCP appliance models that are supported for NIOS 8.2.0 and later releases, and the resources recommended for each model.

<table>
<thead>
<tr>
<th>vNIOS Appliance</th>
<th>Overall Disk (GB)</th>
<th># of vCPU Cores</th>
<th>Memory Allocation (GB)</th>
<th>Supported as Grid Master and Grid Master Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB-V825</td>
<td>250</td>
<td>2</td>
<td>16</td>
<td>Yes</td>
</tr>
<tr>
<td>IB-V1425</td>
<td>250</td>
<td>4</td>
<td>32</td>
<td>Yes</td>
</tr>
<tr>
<td>IB-V2225</td>
<td>250</td>
<td>8</td>
<td>64</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note
You can use the values that appear by default or extend the values as per your requirements. Using less than the recommended resources can cause reduced performance.

The following table lists the supported vNIOS for GCP Cloud Platform models for NIOS 8.4.0 and later releases:

<table>
<thead>
<tr>
<th>vNIOS Appliance</th>
<th>Overall Disk (GB)</th>
<th># of vCPU Cores</th>
<th>Memory Allocation (GB)</th>
<th>Supported as Grid Master and Grid Master Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-V805</td>
<td>250</td>
<td>2</td>
<td>16</td>
<td>No</td>
</tr>
<tr>
<td>CP-V1405</td>
<td>250</td>
<td>4</td>
<td>32</td>
<td>No</td>
</tr>
<tr>
<td>CP-V2205</td>
<td>250</td>
<td>8</td>
<td>64</td>
<td>No</td>
</tr>
</tbody>
</table>

Note
CP-V805, CP-V1405, and CP-V2205 do not support downgrading from NIOS 8.4.x to any earlier NIOS releases.
Deploying vNIOS for GCP

Google cloud networks are called virtual private clouds (VPCs). For more information, refer to https://cloud.google.com/vpc/. Using Infoblox vNIOS for GCP, you can control, provision and manage IP addresses in your GCP VPCs. The following architecture diagrams illustrate the vNIOS Grid deployment on GCP:

Figure.1: Complete vNIOS Grid Deployment on Google Cloud Platform

Figure.2: Hybrid vNIOS Grid Deployment using Google Cloud Platform
Note
Infoblox recommends that you back up your existing configuration before making any changes to your Grid, including the provisioning of a NIOS virtual appliance.
Uploading Images to the Project

1. Download the NIOS GCP ddi.tar.gz image from Infoblox Support site.
2. Use the following commands to log in to the Google Cloud CLI:
   ```
gcloud auth login <use your gcloud account>
gcloud config set project <project name>
```
3. Use the following link to create a bucket in Google Cloud Storage:
   ```
https://cloud.google.com/storage/docs/gsutil/commands/mb
```
4. Use the following command to upload the image to the GCP project bucket:
   ```
gsutil cp "<NIOS GCP ddi.tar.gz file>" gs://<path to gcp bucket>
```
   **Example:** `gsutil cp nios-8.4.0-EA-379714-2019-01-14-12-19-23-ddi.tar.gz gs://nios-bucket`
5. Use the following command to create an image from the NIOS tarball which will can used to create NIOS instance:
   ```
gcloud beta compute images create "<image name>" --guest-os-features MULTI_IP_SUBNET --source-uri gs://<bucket path>/<NIOS GCP ddi.tar.gz filename>
```
Deploying vNIOS for GCP using VM Instances

To deploy vNIOS for GCP virtual appliance using VM instances, complete the following:

2. Navigate to Compute Engine -> VM instances.
3. Click CREATE INSTANCE.
4. To ensure that your vNIOS for GCP appliance functions properly, update the instance configuration as required. Refer to the table Supported vNIOS for GCP Models for specifications.
In the Create an instance panel, complete the following as illustrated in the preceding screenshot. Note that GCP automatically populates some field values based on previous configurations. Click a field that you want to make changes to:

- **Name**: Enter a name for the instance.
- **Region**: Select the Google Cloud region from the drop down list.
- **Zone**: Select a zone where you want your data to be stored.
- **Machine Type**: Select a value from the drop-down list. For more information, refer to the table Supported vNIOS for GCP Models.
- **Boot disk**: You can select an image or snapshot to create a new boot disk, or attach an existing disk to the instance.
  - To select the vNIOS image, complete the following:
    i. Click Change.
    ii. On the Boot Disk panel, go to Custom Images.
    iii. Select the vNIOS for GCP image from public bucket.
    iv. Change the Boot Disk Type to Standard persistent disk.
    v. Change the Size to 250 GB.
    vi. Click Select.
• **Management, security, disks, networking, sole tenancy**: Expand the Management, security, disks, networking, sole tenancy menu.

• **Management**: Go to the Metadata section and add the following key-value pair:
  i. Add **Key**: user-data.
  ii. Add **Value**:
      ```
      #infoblox-config
      temp_license: nios xx-Vxxxx enterprise dns
      remote_console_enabled: y
      ```

**Notes**
- This will install temporary license keys for the selected services.
- NIOS does not support DHCP in GCP.

• **Networking**: NIOS needs two interfaces, one for data and the other for management.

  **Note**
  NIOS instances do not support the GCP **Custom Hostname** feature.

To add the second network interface:
  i. Switch to the **Networking** tab and click **Add network interface**.

  **Note**
  You must use two interfaces for your new Infoblox vNIOS for GCP instance. You can create a new **eth1** interface for your instance and can use the interface to join the new Infoblox vNIOS for GCP instance to a NIOS Grid.

  ii. Change the default network to the correct network.
  iii. Select your subnetwork.
  iv. Click **Done**.
v. You must have two different network interfaces, one for management, and another for LAN.
vi. Click Add network interface to add another network interface.
vii. For the second network, i.e. network1, choose subnet1 as subnet.
viii. Click the Security tab and add your SSH key string.
ix. Click Create to deploy the vNIOS GCP instance.

Note
Infoblox recommends that you use a static IP instead of Ephemeral. If you choose Ephemeral, the IP address changes every time the system reboots.
Provisioning vNIOS for GCP using Metadata

You can provision the Infoblox vNIOS for GCP instance through the Management -> Metadata field without using Elastic Scaling. In this section, you specify the feature licenses for the new Infoblox vNIOS for GCP instance. In the Metadata section, specify user-data in the key field and define the following values in the value field:

- **remote_console_enabled**: Enter y to enable the remote SSH CLI console for a new instance. To disable the remote SSH CLI, enter n.
- **temp_license**: Defines the NIOS feature licenses for the new instance. You can list a collection of temporary license names that apply to the instance during the initial boot. Using this directive allows you to quickly provision the new instance with temporary licenses without having to open a NIOS CLI session to do the same task. To access the NIOS GUI, you must provision the vNIOS license before you start the vNIOS instance.

**Note**
Specify the NIOS model license with the temporary licenses in the Userdata field to provision temporary licenses.

Infoblox recommends that you also provision the Grid and Cloud licenses at the same time as follows:

```
temp_license:grid cloud vnios.
```

All text entries must be in lower case. Valid license names include the following:

- **TE- Infoblox vNIOS for GCP instances (TE-825, TE-1425 and TE-2225):**
  - nios
  - grid
  - dns
  - enterprise
  - cloud
- **NIOS license for DDI (TE-V825, TE-V1425, TE-V2225, CP-V805, CP-V1405 and CP-V2205):**
  - nios IB-Vxxxx, where "xxxx" is the license number.

**Note**
To provision vNIOS for GCP using Elastic Scaling, specify the Grid Master IP address of the vNIOS for GCP instance in the Userdata field.
Creating Cloud DNS Policy

You can create a cloud DNS policy to use vNIOS as an alternate DNS service. To create a cloud DNS policy, complete the following steps:

2. In the GCP Portal, click Network Services -&gt; Cloud DNS in the Navigation menu.
3. Click DNS server policies and then click CREATE POLICY.
4. In the Create a DNS policy panel, complete the following as illustrated in the following screenshot. Click a field that you want to make changes to:

   - **Name**: Enter a name for the DNS policy.
   - **Inbound query forwarding**: Use this option to route DNS queries directly to the Google Cloud default DNS name server. Select On to enable this option, or select Off to disable this option.
   - **Alternate DNS Servers**: Enter the IP address of the vNIOS instance that must be used as the DNS server.
   - **Networks**: Select a network from the drop-down list.
Click **Create** to create the DNS policy.
Creating GCP Service Account

To create a GCP service account, complete the following steps:

1. To create a service account in GCP, go to [http://console.cloud.google.com](http://console.cloud.google.com).
2. In the GCP console, click IAM and admin -> Service accounts in the Navigation menu.

3. Click CREATE SERVICE ACCOUNT.

4. In the Create service account panel, complete the following:
   - Service account details: Enter a name for the service account and click CREATE.
- **Service account permissions (optional):** Select and assign roles to the service account from the drop-down list and click **CONTINUE**.

**Note**
For GCP vDiscovery, you must assign **Project -> Viewer** and **Compute Engine -> Compute Viewer** roles.
4. **Create key**: Click **Create Key** and select **JSON** as the key type. Click **CREATE**.

5. The JSON file gets downloaded and saved in your local disk. The JSON file contains key details that is necessary to establish a connection between Infoblox NIOS and GCP.
Performing GCP vDiscovery

You can use the Infoblox vDiscovery feature to detect and obtain information about virtual entities and interfaces in the GCP (Google Cloud Platform). You must first select a member to run the vDiscovery job. To ensure that the job is executed properly, verify the connection between the discovering member and the discovered endpoint. Infoblox vDiscovery for GCP supports the resource manager model. You can discover tenants, subnets, VPCs, and workload VMs through Infoblox vDiscovery for GCP. When you configure vDiscovery jobs, you can enable the Infoblox NIOS appliance to automatically create DNS records for discovered IP addresses of VM instances that are served by the NIOS appliance. You can configure the appliance to add DNS records for specific DNS views associated with the network view defined for public and private IP addresses of VM instances served by the appliance. For information on how to perform GCP vDiscovery, see Selecting the Endpoint Server in NIOS online documentation.

Known Limitations

NIOS virtual appliance for GCP has the following limitations:

1. Infoblox vDiscovery for GCP does not support discovery of load balancers.
2. When a VM in GCP uses the custom hostname option, the VM name and the VM hostname are different. The vDiscovery for GCP uses only the VM name for the managed VM and ignores the VM hostname.
3. When running vDiscovery across multiple projects, user must create one vDiscovery job per GCP project. vDiscovery across multiple GCP projects through a single vDiscovery job is not supported.