DEPLOYMENT GUIDE

INFOBLOX vNIOS FOR GOOGLE CLOUD

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INTRODUCTION

Infoblox vNIOS for Google Cloud is a virtualized Infoblox appliance designed for deployment as a virtual machine (VM) instance in Google Cloud.

Infoblox vNIOS for Google Cloud enables you to deploy robust, manageable and cost effective Infoblox appliances in the Google Cloud. Infoblox NIOS is the underlying software running on Infoblox appliances and 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 Domain Name System (DNS), IP address management (IPAM), Dynamic Host Configuration Protocol (DHCP) and other services.

Infoblox vNIOS for Google Cloud appliances can either be joined to an existing on-premises or hybrid/multi-cloud grid or the entire grid can run in Google Cloud. The vNIOS appliance can be configured as a primary DNS server for your Google Cloud Virtual Private Clouds (VPCs). You can also use Infoblox Cloud Network Automation with vNIOS for Google Cloud to improve visibility of cloud resources and increase the flexibility of your cloud environment.

PREREQUISITES

The following are prerequisites for deploying an Infoblox vNIOS for Google Cloud appliance:

- Valid subscription in Google Cloud.
- Appropriate permissions in Google Cloud to create a VM instance and other required resources.
- Infoblox Support account at https://support.infoblox.com.
- Understanding of basic networking concepts and tools, including public and private IP addressing, DNS, Secure Shell (SSH) and command line/terminal applications.

LIMITATIONS

The following general limitations apply for Infoblox vNIOS for Google Cloud appliances:

- Only provides the LAN1 and MGMT (not enabled by default) interfaces.
- No High Availability (HA) support.
- No native Google Cloud support for Anycast with NIOS.
- DHCP can be served for on-premises clients only, not for clients running in Google Cloud.

BASIC WORKFLOW

The following bullet points provide a basic outline of steps that an administrator new to Google Cloud may follow when creating an Infoblox vNIOS VM:

- Install Google Cloud CLI.
- Navigate to Google Cloud: https://console.cloud.google.com/.
- Create one or two new VPCs and subnets (NIOS 8.5 requires two network interfaces, each in a separate VPC. Starting with NIOS 8.6, you can deploy one or two network interfaces).
- Upload image file and Create custom image.
- Launch your Infoblox vNIOS for Google Cloud appliance using the custom image.
- Once the Infoblox vNIOS for Google Cloud appliance has successfully deployed, verify its IP configuration.
- Connect to the Infoblox vNIOS for Google Cloud appliance and begin using it.

BEST PRACTICES

- For maximum availability, Infoblox appliances should be deployed across as many different availability zones and regions as needed.
- Promptly change the default admin password in NIOS.
- Use name server groups to simplify name server assignments for DNS configurations.

GOOGLE CLOUD OBJECTS AND TERMS

Before implementing Infoblox vNIOS for Google Cloud, an administrator should understand common terms or objects available in Google Cloud related to the implementation of vNIOS. The following are common objects and terms:

- **VPC:** Virtual Private Clouds provide network functionality Google for Compute Engine and other resources. Networks and subnets are found within VPCs.
- **Shared VPC:** Shared VPCs allow resources from multiple projects to connect to a central VPC network, providing connectivity between all resources using private IP addresses.
- **Persistent Disk:** Block storage used for VM instance disks.
- **Cloud Storage:** Object storage with options suitable for many use cases.
- **Instance Availability Policies:** Used to control a VM's maintenance or restart behavior.
- **Google Cloud CLI:** A CLI tool installed locally that enables you to script operations and to create and manage services and resources in Google Cloud.
- **Instance:** A VM deployed in Google Cloud.
- **Compute Engine:** An infrastructure as a service (IaaS) offering on Google Cloud that provides VMs and other compute workloads.
- **Bucket:** Basic organizational containers that hold data and objects in Google Cloud storage.
- **Region:** A collection of data centers in a specific geographic area where you can choose to host resources.
- **Zone:** Often referred to as an Availability Zone. An isolated location within a Region. Some resources, such as VM instances are zonal, meaning they are contained in a single zone. Other resources, including subnets span multiple zones in a region.
- **Cloud Interconnect:** A highly available, low latency connection between your on-premises network and Google Cloud. Can also connect through a partner service provider.

Source: https://cloud.google.com/docs/

INFOBLOX vNIOS FOR GOOGLE CLOUD USE CASES

The following are common use cases for the Infoblox vNIOS for Google Cloud appliance:

- Providing DNS and response policy zone (RPZ)/DNS firewall services from within the Google Cloud for Google Cloud, on-premises and other cloud-based clients.
- Expanding services to the Google Cloud cloud for additional fault tolerance and disaster recovery (DR) purposes.
- Providing services with maximum availability across multiple zones and regions.

THE DNS AND RPZ SERVICES USE CASE

In this use case, DNS and RPZ services are hosted in Google Cloud. This enables you to distribute enterprise DNS services for clients Google Cloud, on-premises and across the internet. One or more Infoblox vNIOS for Google Cloud appliances are deployed in Google Cloud across as many different zones and regions as feasible. These appliances can also be integrated with an existing Grid, either on-prem or in the cloud. Clients are then updated to use your Infoblox vNIOS for Google Cloud appliance(s) for DNS resolution, providing them with your enterprise DNS and RPZ services.

THE FAULT TOLERANCE AND DISASTER RECOVERY USE CASE

This use case is for fault tolerance and disaster recovery. In case of failure in the primary data center (power outage, network outage or other critical failure) an Infoblox vNIOS for Google Cloud appliance enabled as a Grid Master Candidate (GMC) can be promoted to the Grid Master role so that Grid services can continue to operate. DNS services can also be redirected to servers operating in Google Cloud, possibly without even requiring any manual intervention and helping ensure that business continues to function.

DHCP SERVICE FOR ON-PREMISES CLIENTS

A vNIOS appliance running on Google Cloud can provide DHCP service for your on-premises clients. This DHCP appliance can serve as your primary DHCP server or be configured as part of a failover pair with a NIOS DHCP server running on-premises for a hybrid, survivable solution. Two vNIOS appliances, each running in Google Cloud could also be configured for DHCP failover for highly available, fault-tolerant DHCP services. Using a vNIOS appliance running on Google Cloud for DHCP requires using DHCP relay or IP helper on your router or layer 3 switch to send DHCP traffic from your on-premises network to your Google Cloud VPC.

THE MAXIMUM AVAILABILITY USE CASE

In many cases, it can be a challenge to implement services in a way that maximizes availability across a distributed environment in a secure manner and without deploying more resources than are required. One method for accomplishing this may be by leveraging a “shared services VPC network” where critical services, including your Infoblox servers, operate from. Google Cloud VPC Network Peering can be used to connect other VPC networks to the management VPC network.

This allows for seamless communications between those VPC networks and the shared services VPC network, without allowing connectivity between the other subnets. Traditional routing and/or VPNs can also be used to allow connectivity into the shared services VPC Network for VPC Networks which cannot leverage VPC network peering, or even from networks outside of Google Cloud.

INSTALL GOOGLE CLOUD COMMAND LINE TOOLS

Uploading and creating the custom image used to deploy vNIOS in Google Cloud requires the use of Google Cloud command line tools. This section describes how to install these tools prior to starting deployment.

GOOGLE CLOUD CLI

One required tool is the Google Cloud CLI. The steps to install the Google Cloud CLI will vary depending on your operating system. Visit https://cloud.google.com/sdk/gcloud/ for installation instructions and to download the installer for your operating system.

Make sure to install the Google Cloud CLI before proceeding through this guide. Once installed, run the command **gcloud auth login** to log in and start your session. This will open a browser window. Follow the prompts to complete the log in process.

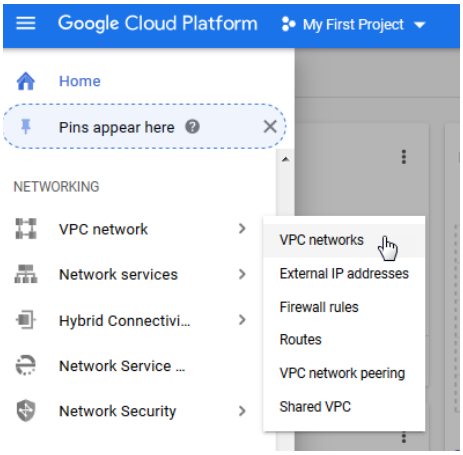
PREPARE YOUR GOOGLE CLOUD ENVIRONMENT

Once you install the necessary tools and log in to your Google Cloud account, you are ready to begin setup of resources, such as the VPC networks and firewall rules. These will be required before you can deploy and use any VMs.

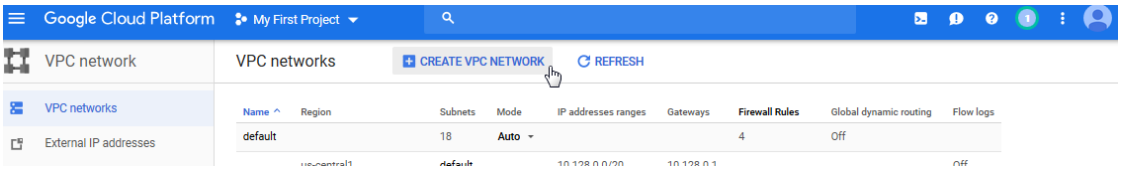
CREATE VPCs

To create your VPCs and subnets, log in to the Google Cloud Console.

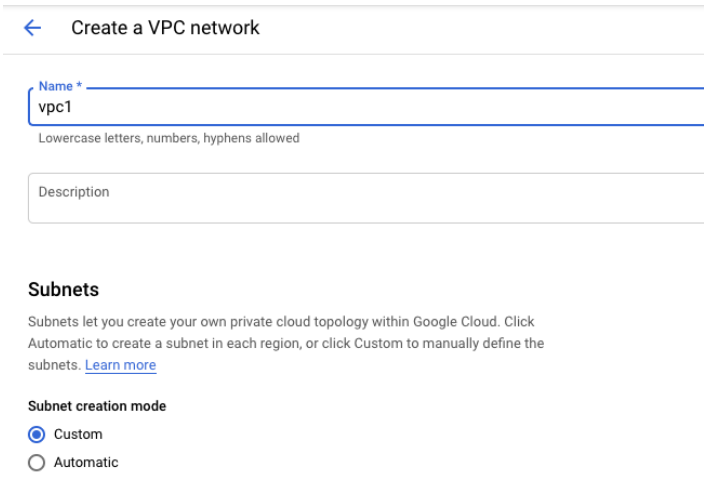
1. In the navigation menu, expand **VPC network** and select **VPC networks**.



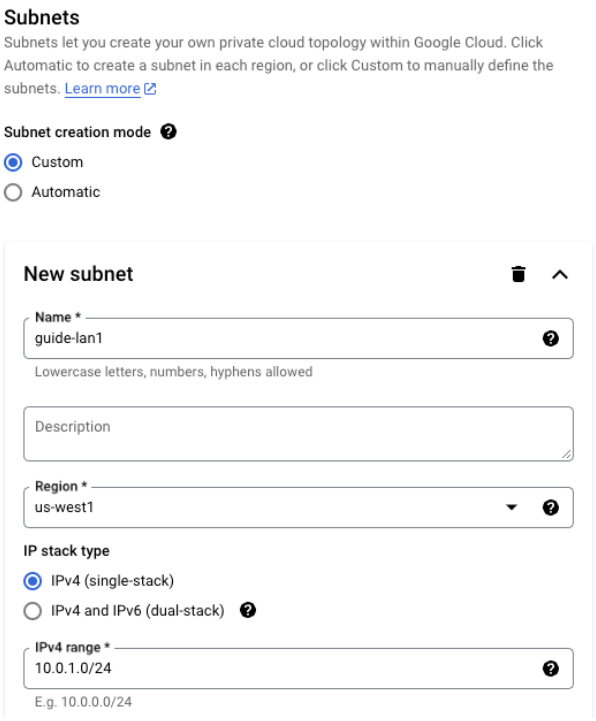
2. Click **CREATE VPC NETWORK**.



3. Type a name, description (optional) and set the **Subnet creation mode** to **Custom**.



4. Type a name for your subnet.
5. Expand the **Region** menu and select the region for your subnet.
6. Type the IP address range for your subnet. Example: **10.0.1.0/24**.
7. Scroll down and click **Done** for the subnet.



8. Scroll down and click **CREATE**.

Note: Starting with NIOS version 8.6, instances can be deployed with either one or two NICs. For older NIOS versions, two NICs and two VPC networks are required when deploying vNIOS for Google Cloud appliances. If required or desired, repeat the above steps to create a second VPC network with a subnet in the same region, using a different address range.

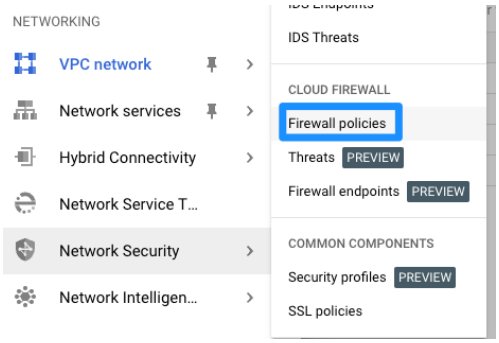
9. Wait and verify that each VPC network is are created successfully.

CREATE FIREWALL POLICY AND RULES

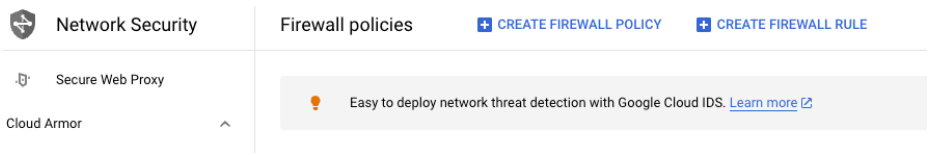
The firewall rules are used to control network access into and out of your VPC networks. In this example, we walk through the steps to create a policy with rules to allow all egress (outbound) traffic from your Infoblox vNIOS for Google Cloud instance and to allow ingress (inbound) traffic on specific ports.

Note: Examples shown here are overly permissive, allowing traffic from any IP, and are for example purpose only. Use best practices in your environment, allowing only the minimal traffic necessary.

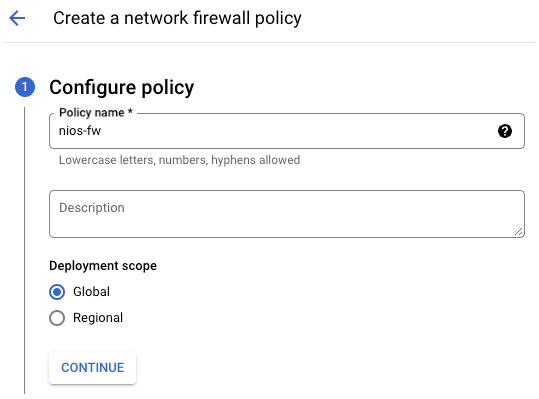
1. In the navigation menu, expand **Network Security** and select **Firewall policies**.



2. Click **CREATE FIREWALL POLICY**.

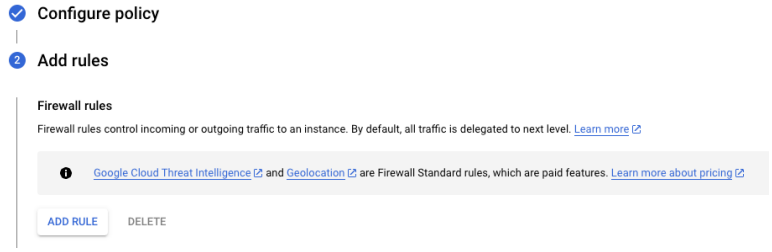


3. Type a name and a description (optional).
4. Click **CONTINUE**.



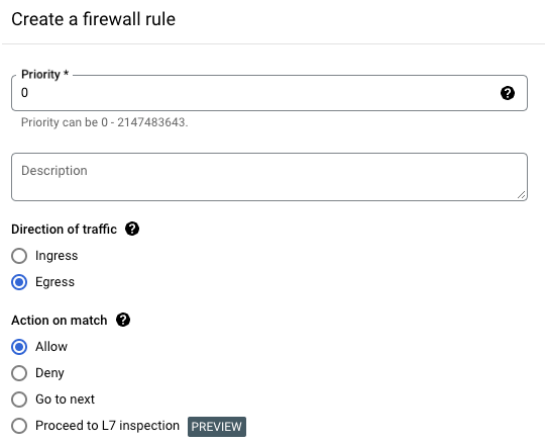
CREATE OUTBOUND RULE

5. Click **ADD RULE**.

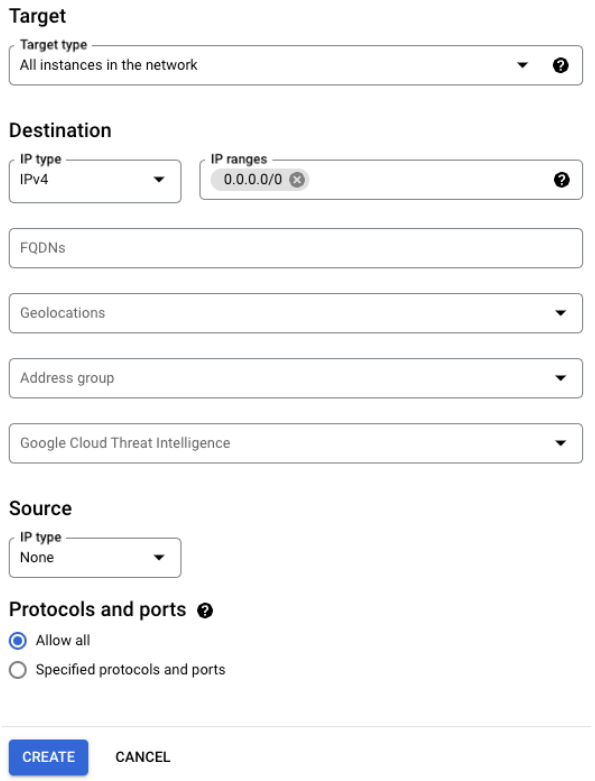


6. The priority is used to control the order in which the firewall rules are processed, starting from 0. Google Cloud uses a default of 1,000. In this example, we will first set the egress rule to allow all outbound traffic, so we will change this to 0.

7. Set the **Direction of traffic** to **Egress** and **Action on match** to **Allow**.



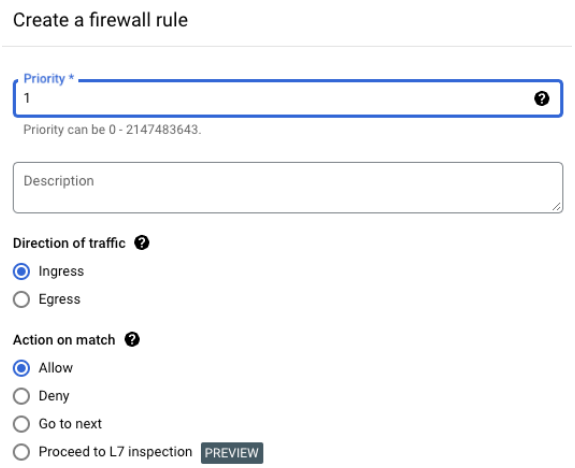
8. Expand the **Target type** menu and select **All instances in the network**.
9. For the **DestinationIP type** select **IPv4**.
10. For the **Destination IP type**, enter **0.0.0.0/0** to allow outbound traffic to any destination.
11. Toggle the **Protocols and ports** option to **Allow all**.
12. Click **CREATE**.



CREATE INBOUND RULE

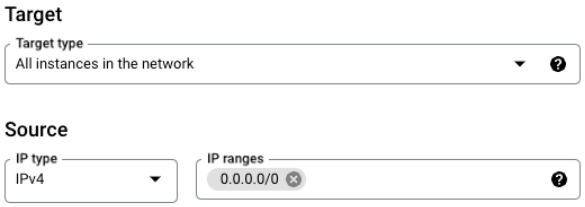
Next, we'll create a firewall rule to allow appropriate traffic inbound to the VPC for the vNIOS instances. For full details on ports and protocols used by Infoblox NIOS, refer to NIOS documentation at https://docs.infoblox.com.

1. Click **ADD RULE**.
2. Set the **Priority**.
3. Set the **Direction of traffic** to Ingress and **Action on match** to Allow.



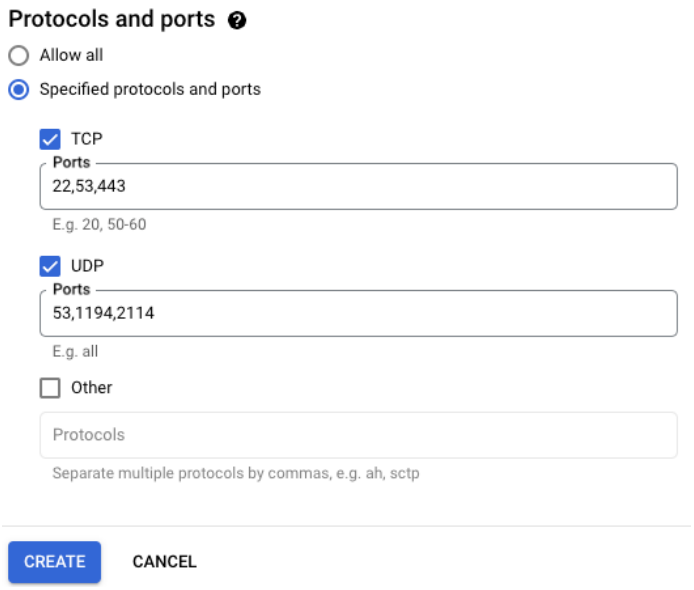
4. Expand the **Target type** menu and select **All instances in the network**.
5. Expand the **Source IP type** menu and select **IPv4**.
6. For the **Source IP ranges**, enter 0.0.0.0/0 to allow traffic from anywhere.

Note: For security of production environments, limit the source IP ranges.

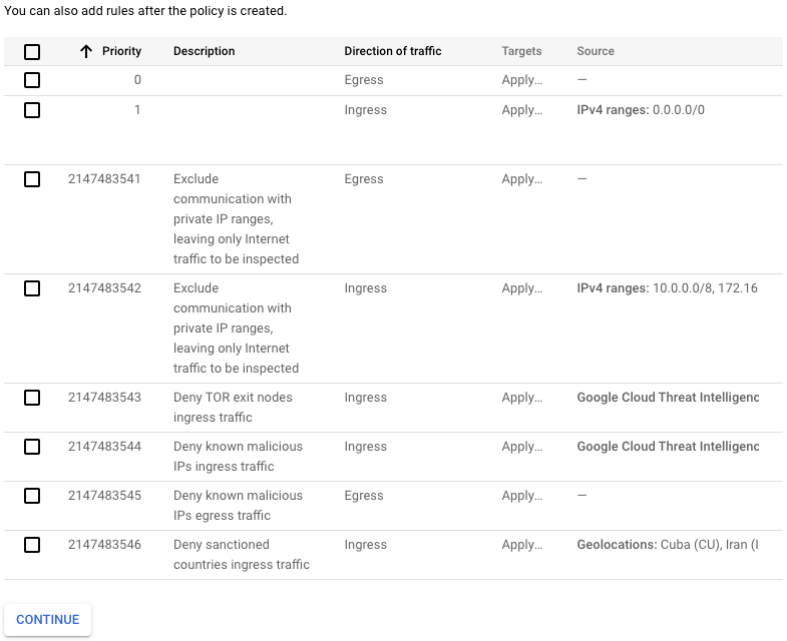


7. Toggle the **Protocols and ports** option to **Specified protocols and ports**.
8. Check the boxes for **TCP** and **UDP**.
9. Enter the following ports:
   - » TCP: 22, 53, 443
   - » UDP: 53, 1194, 2114

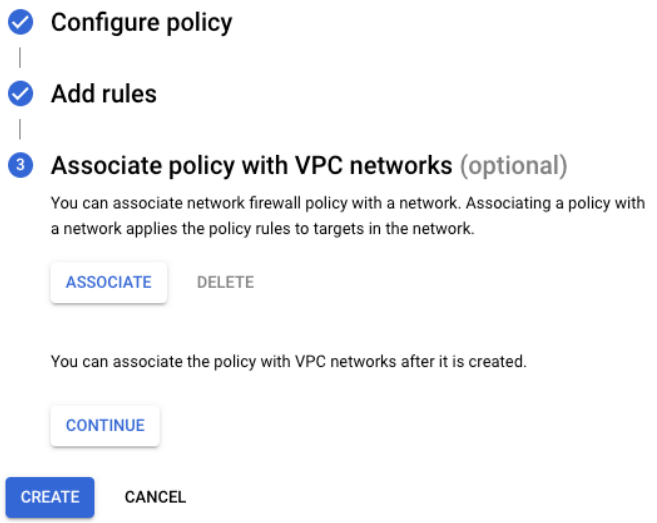
10. Click **CREATE**.



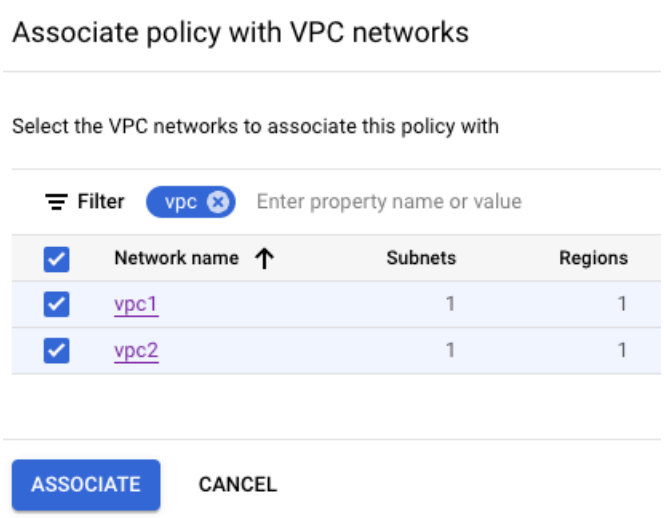
11. Review the rules you created as well as those automatically created for you.
12. Click **CONTINUE**.



13. Click **ASSOCIATE**.



14. Select the VPC(s) to associate this policy with.
15. Click **ASSOCIATE**.



16. Click **CREATE**.

INFOBLOX vNIOS FOR GOOGLE CLOUD IMAGE

The Infoblox vNIOS for Google Cloud appliance can be deployed using an image file downloaded from the Infoblox Support portal.

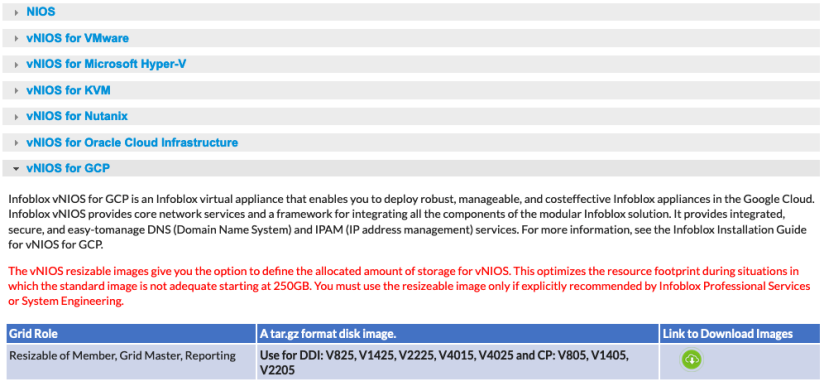
DOWNLOAD vNIOS FOR GOOGLE CLOUD IMAGE

To download theVM image file:

1. In your browser, navigate to https://support.infoblox.com/ and sign in.
2. Click on **Download Center**.

3. Select the desired version of NIOS.

4. Scroll down to and expand the **vNIOS for Google Cloud** option.
5. Click the link to download.



6. Accept any terms (if prompted). Depending on your browser settings, you may be prompted to save the file or it may download automatically. Proceed through the prompts (if any) to complete the download.

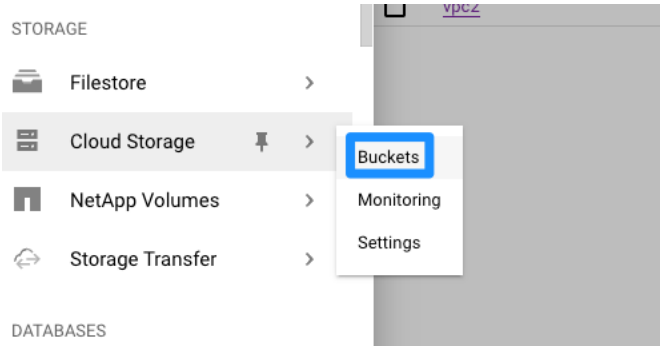
UPLOAD INFOBLOX vNIOS FOR GOOGLE CLOUD IMAGE FILE

Before you can deploy your Infoblox vNIOS for Google Cloud appliance, you will need to create a storage bucket and upload the appliance image.

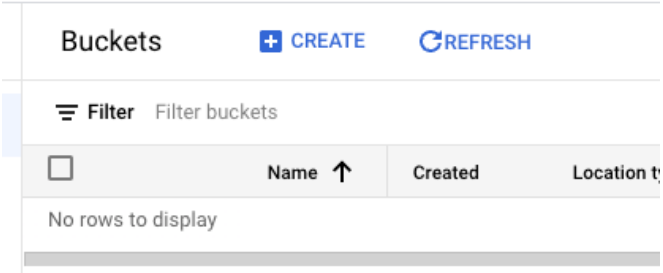
Create Bucket

To create a bucket using the Google Cloud Console:

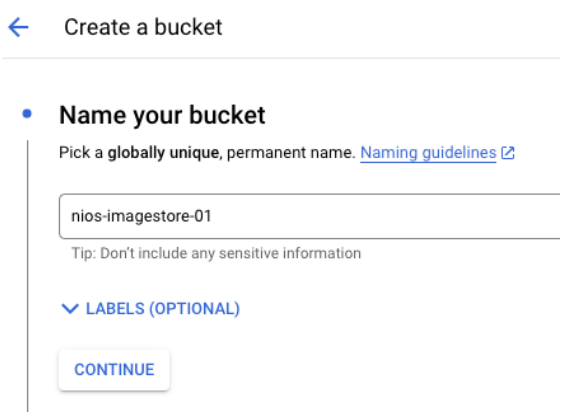
1. In the Google Cloud Console navigation menu, expand **Cloud Storage** and; select **Buckets**.



2. Click **CREATE**.

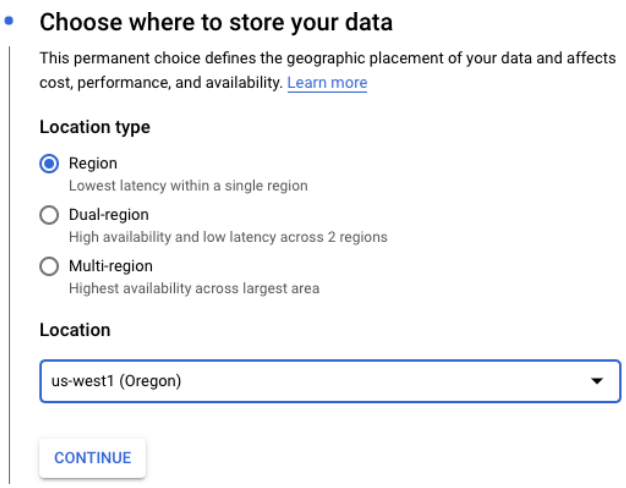


3. Type a name and click **CONTINUE**.

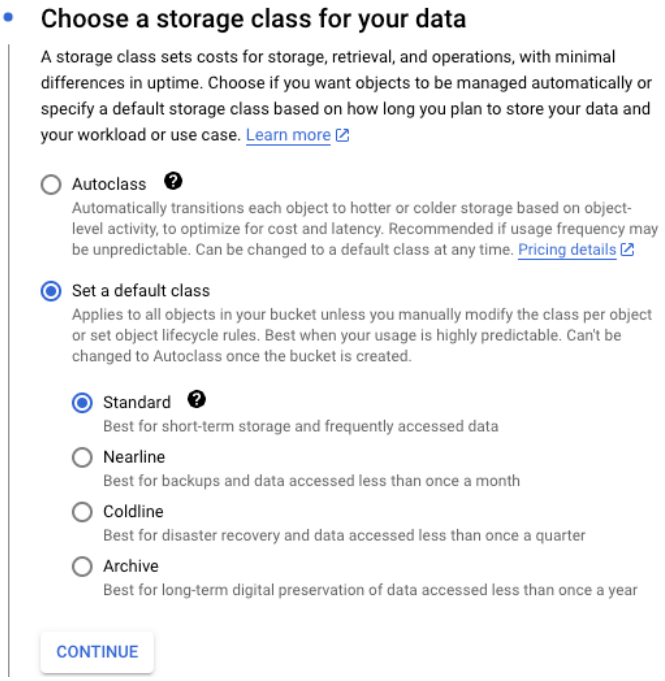


4. Select Region for **Location type** and choose a **Location** from the dropdown.

5. Click **CONTINUE**.

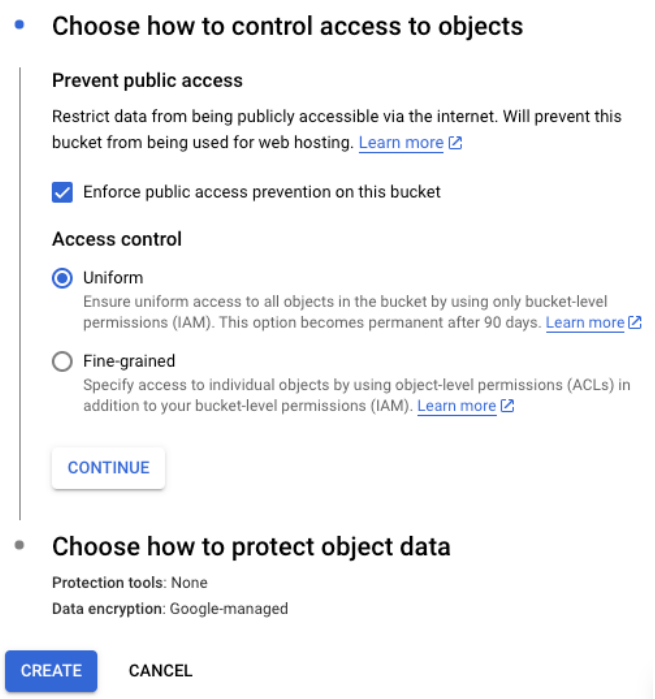


6. Use the default **Standard** storage class.
7. Click **CONTINUE**.



8. Choose your desired **Access control** options.

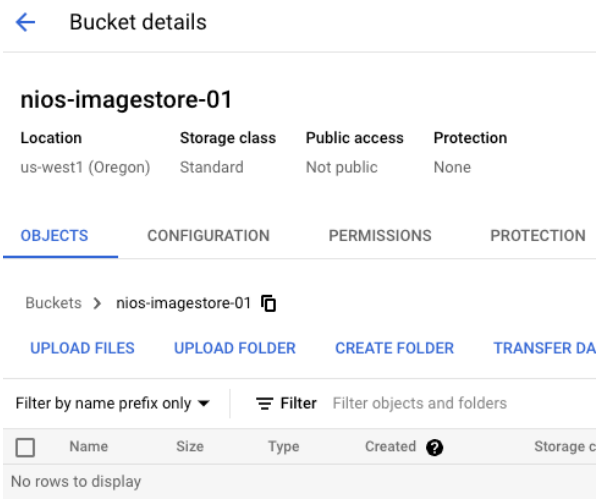
9. Click **CREATE**.



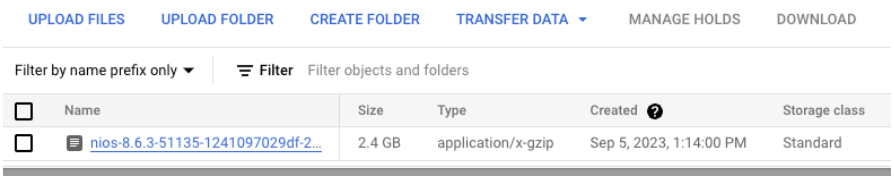
Upload Image File to Bucket

Once the bucket creation completes, your new bucket will be open in the browser.

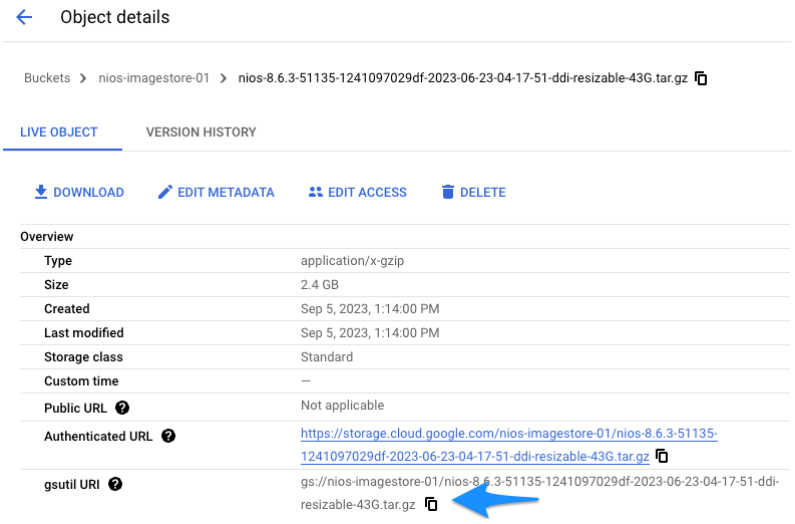
1. Click **UPLOAD FILES**.



2. Follow the prompts to browse to and upload your Infoblox vNIOS for Google Cloud appliance image file. This file can be over 2 GB in size and the upload may take a while to complete.
3. Verify that the file upload completed successfully.



4. To get the URI of your uploaded image, which you will need to create a custom image, click on the file name in your bucket.
5. 5. On the **Object details** page, click the copy button next to gsutil Uniform Resource Identifier (URI) to copy this to your clipboard.



CREATE INFOBLOX vNIOS FOR GOOGLE CLOUD CUSTOM IMAGE

VM instances are deployed using a predefined image. This guide provides the steps to create a custom image using an Infoblox vNIOS for Google Cloud image file previously uploaded into your project's storage bucket.

Important: Infoblox vNIOS version 8.4 and 8.5 appliances are deployed with two network interfaces that will correspond to the LAN1 and MGMT (not enabled by default in NIOS). Because of this, the MULTI_IP_SUBNET feature must be enabled in the image or else the deployed vNIOS appliance will be unable to communicate on the network. While the second network interface is optional beginning with NIOS 8.6, this method should still be used for creating custom images. As of this writing, the MULTI_IP_SUBNET feature is only available using the Google Cloud CLI.

For more information regarding the deployment of VMs with multiple network interfaces in Google Cloud, refer to https://cloud.google.com/vpc/docs/create-use-multiple-interfaces.

To create a custom image using the Google Cloud CLI:

1. Open a terminal or command line application on the computer where you installed the Google Cloud CLI.
2. If not already logged in, first authenticate using the Google Cloud CLI:

   gcloud auth login
3. Follow the prompts in your browser to log in.
4. Run the following command to create your custom image:

gcloud compute images create <image_name> --guest-os-features MULTI_IP_SUBNET --source-uri <Source_URI>

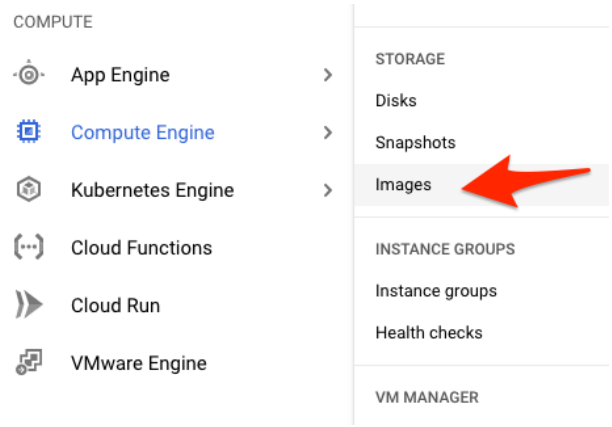
   a. In the above example, replace **<image_name>** with the name you want for your image.

      Note: Names can be up to 62 characters, must start with a lowercase letter, may contain lowercase letters, numbers or hyphens, and cannot end with a hyphen.

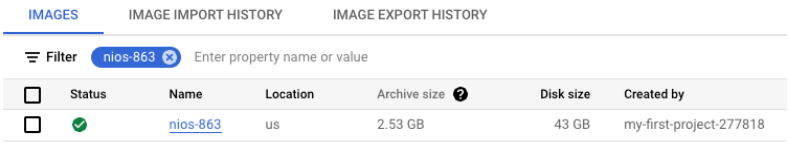
   b. In the above example, replace the **<Source_URI>** with the URI for the Infoblox vNIOS for Google Cloud appliance image file you uploaded in the last section.

```
jradebaugh@IB-C02F61PQMD6N ~ % gcloud compute images create nios-863 --guest-os-
features MULTI_IP_SUBNET --source-uri gs://nios-imagestore-01/nios-8.6.3-51135-1
241097029df-2023-06-23-04-17-51-ddi-resizable-43G.tar.gz
Created [https://www.googleapis.com/compute/v1/projects/my-first-project-277818/
global/images/nios-863].
NAME      PROJECT                 FAMILY  DEPRECATED  STATUS
nios-863  my-first-project-277818                     READY
```

5. Wait for the image creation to complete.
6. To view your new custom image in the Google Cloud Console, in the navigation menu expand **Compute Engine**. Select **Images**.



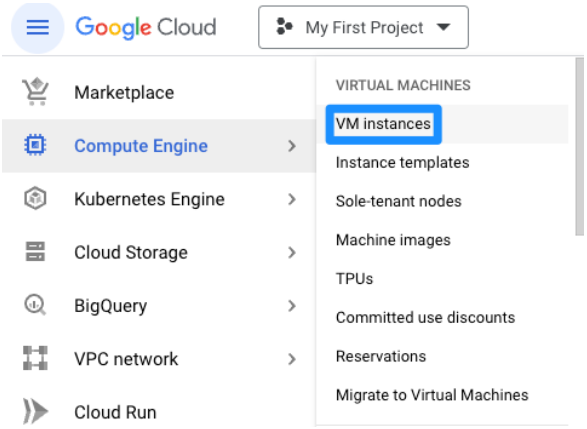
7. Enter the name of your image in the filter.



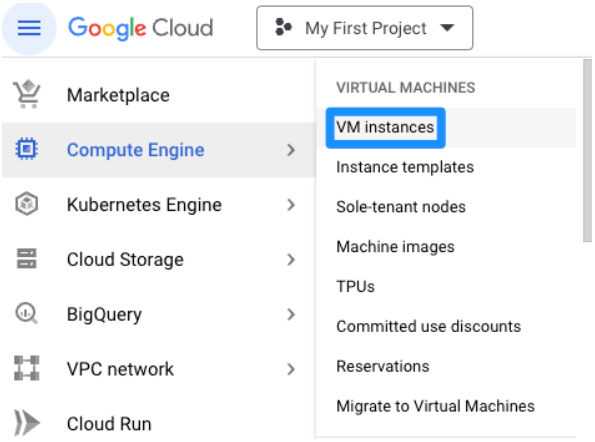
DEPLOY INFOBLOX vNIOS FOR GOOGLE CLOUD INSTANCE

To deploy an Infoblox vNIOS for Google Cloud VM instance using the custom image you created:

1. In the Google Cloud Console navigation menu, expand **Compute Engine**. Select **VM instances**.



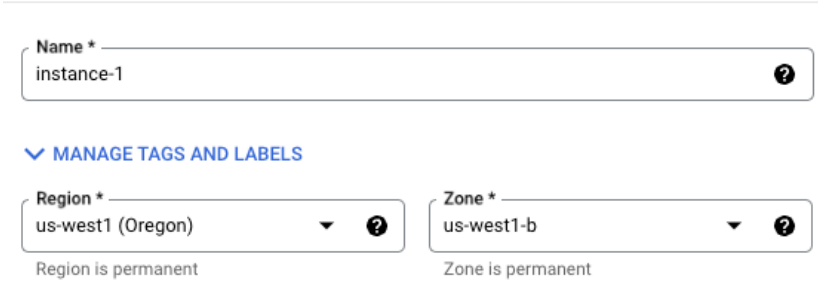
2. Click **CREATE INSTANCE**.



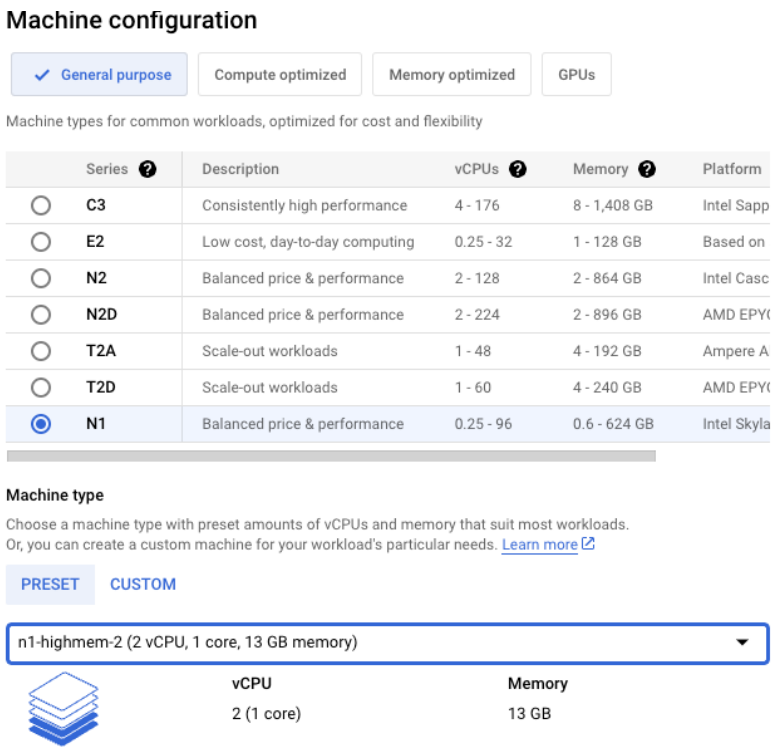
CONFIGURE INSTANCE SIZE AND IMAGE

1. Type a name for your instance.
2. Select the desired **Region** and **Zone**.

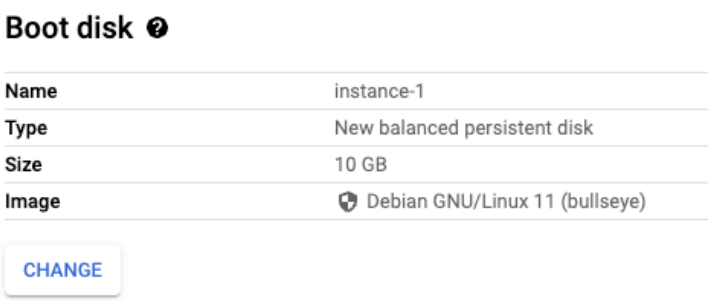
Note: This should be the same region your VPC subnets are in.



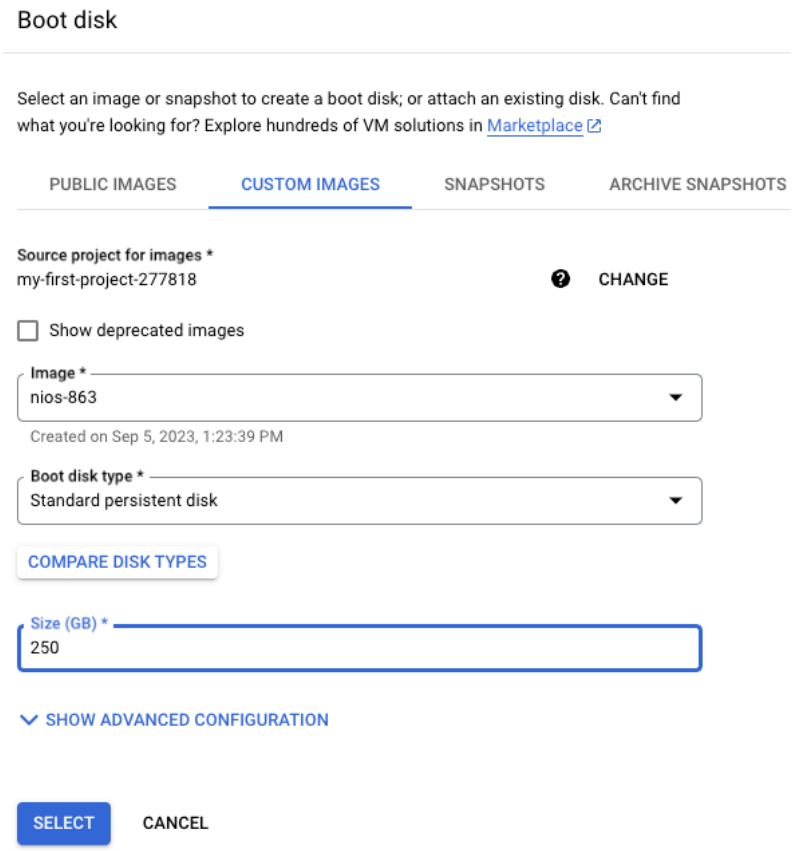
3. In the **Machine configuration** section, select **General purpose**.
4. For **Series**, select **N1**.
5. Use the **Machine type** dropdown to select the instance size corresponding to desired NIOS model. Supported models and instance types are found in vNIOS for Google Cloud documentation (the example used in this guide is an IB-V825).



6. For **Boot disk**, click Change.



7. Switch to the **Custom images** tab.
8. Select the custom image for your vNIOS for Google Cloud appliance image from the dropdown.
9. For **Boot disk type**, select **Standard persistent disk**.
10. Set the Size (GB) field to match the size required for the appliance model type being deployed. Refer to vNIOS for Google Cloud documentation for the supported disk sizes.
11. Click **SELECT**.



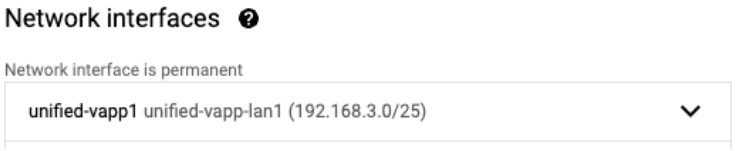
CONFIGURE NETWORK INTERFACE(S)

Infoblox vNIOS for Google Cloud instances using NIOS version 8.6 and later can be deployed with one or two network interfaces. Instances deployed with a single network interface can be deployed into a standard VPC or a shared VPC. Older versions of NIOS require two network interfaces. Follow instructions in the appropriate subsection depending on the number of network interfaces and VPC type you will deploy.

Single Network Interface

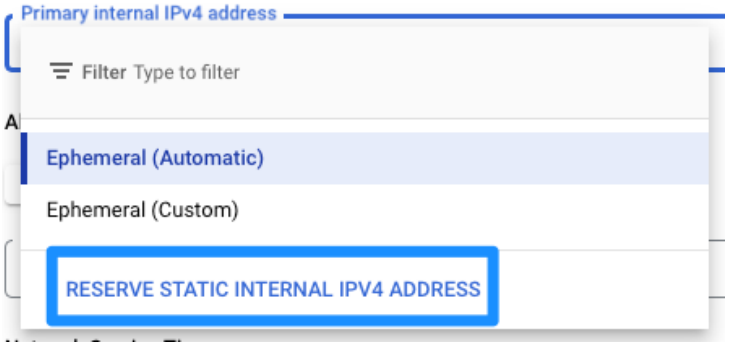
1. Expand the **Advanced options** section.
2. Expand the **Networking** section.

3. Under **Network interfaces**, expand the default network interface.



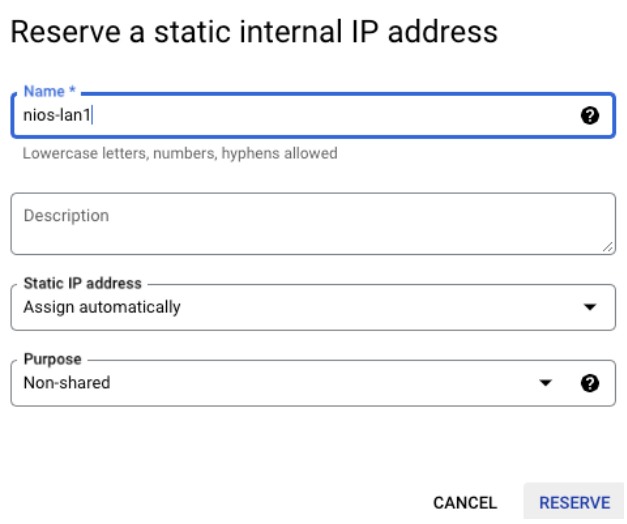
4. Expand the **Network** dropdown and select the VPC to use for the interface.
5. Select the subnet that you want to use for your interface.

6. It is recommended that you have a static IP address for the LAN1 interface. To reserve a static address, select **RESERVE STATIC INTERNAL IP ADDRESS** from the **Primary internal IPv4 address** dropdown.



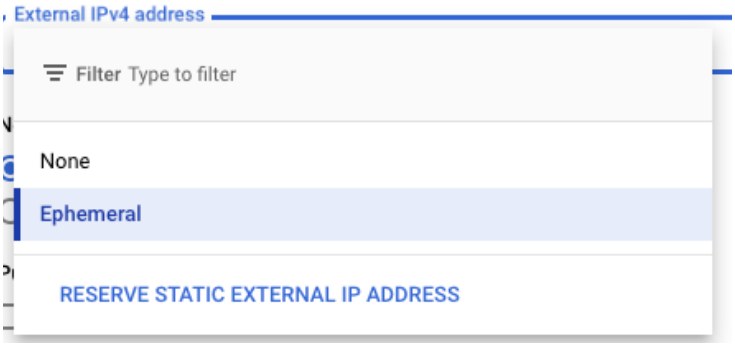
7. In the dialog window, enter a **Name** for the IP reservation.
8. Under **Static IP address**, you can leave it set to **Assign automatically** or choose an IP address if desired.

9. Click **RESERVE**.

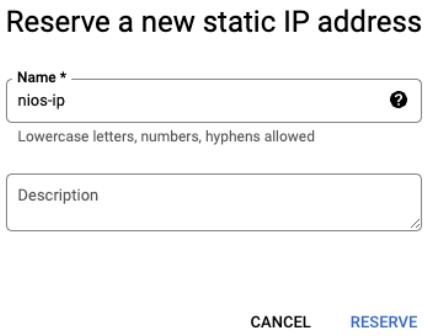


10. Select **RESERVE STATIC EXTERNAL IP ADDRESS** from the **External IPv4 address** dropdown.

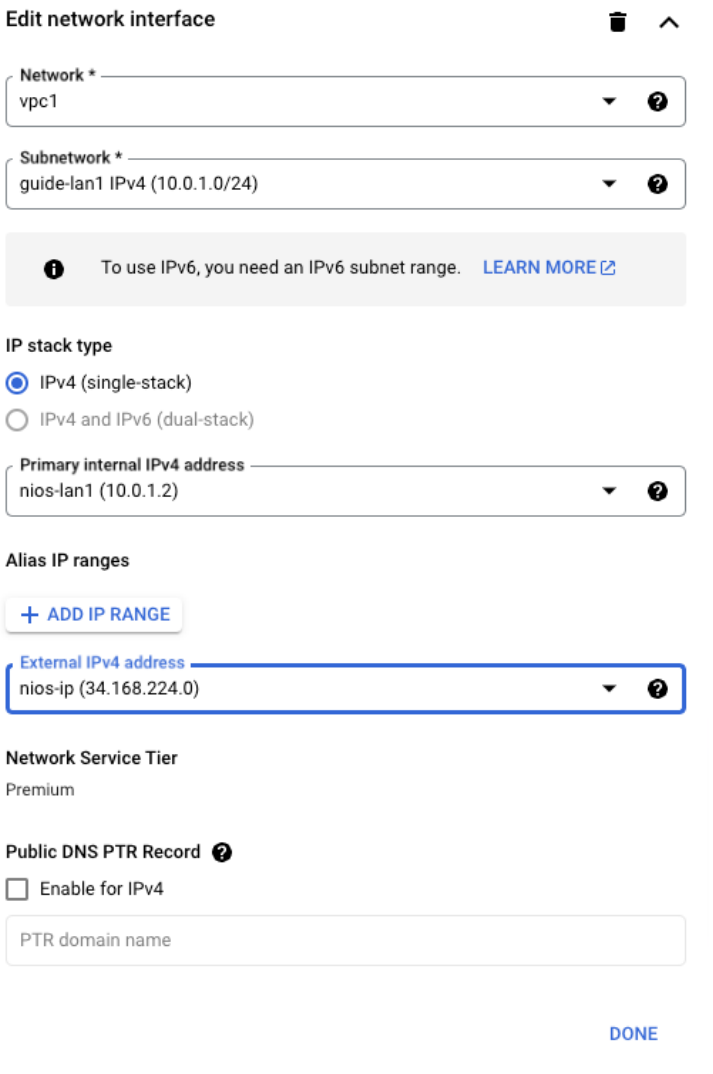
Note: If you plan to connect to your vNIOS instance using VPN, Cloud Interconnect or another private method, you may not need an external IP address.



11. In the **Reserve IP** dialog, enter a **NAME** for the reservation.
12. Select a **Network Service Tier**.
13. Click **RESERVE**.

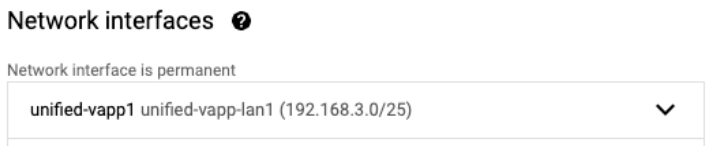


14. Click **DONE**.



Two Network Interfaces

1. Expand the **Advanced options** section.
2. Expand the **Networking** section.
3. Under **Network interfaces**, expand the default network interface.



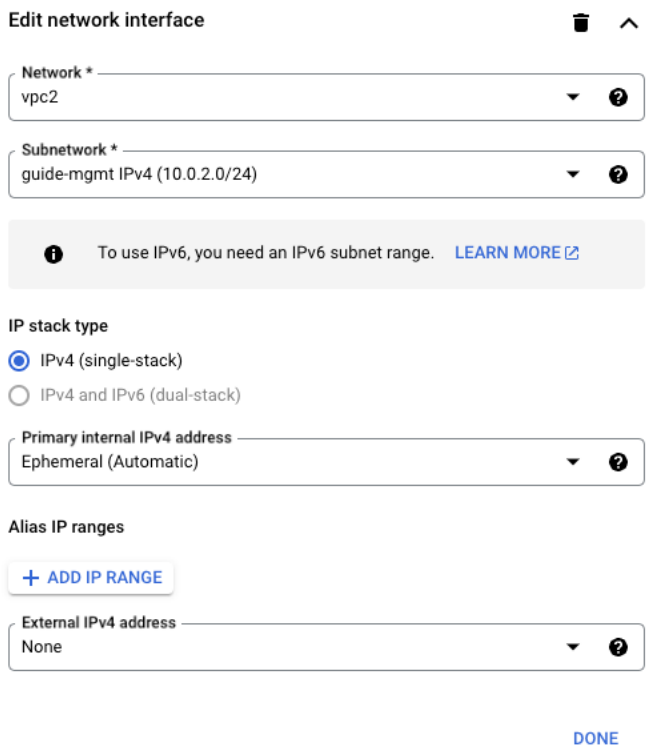
Note: This first network interface will be labeled as nic0 for the Google Cloud VM instance. When deploying instances with two interfaces, this will be the MGMT interface in vNIOS.

4. Expand the **Network** dropdown and select the VPC to use for the interface.
5. Select the subnet that you want to use for your interface.

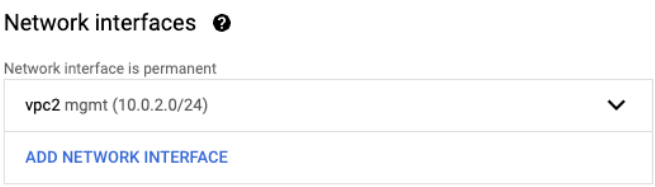
6. For **External IPv4 address**, select **None**.

Note: You can add an external IP for the MGMT interface if desired, but this is not commonly needed.

7. Click Done.



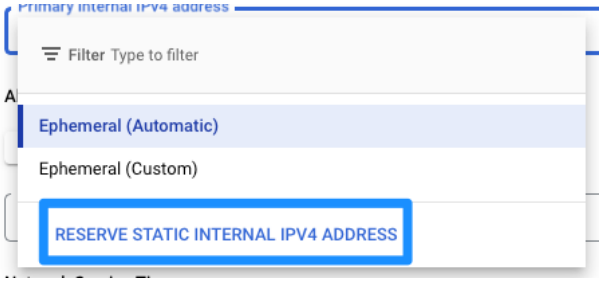
8. Click **ADD NETWORK INTERFACE**.



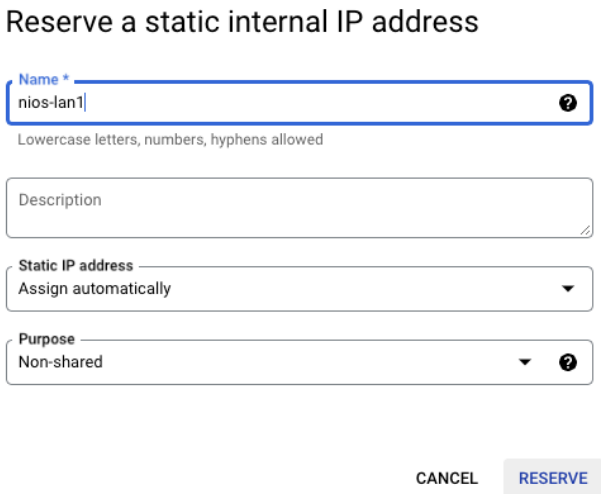
Note: This new network interface will be labeled as nic1 for the Google Cloud VM instance. This will be the LAN1 interface in vNIOS.

9. Select the VPC and subnet to use with this interface (this must be a different VPC than the one used with the MGMT interface).

10. It is recommended that you have a static IP address for the LAN1 interface. To reserve a static address, select **RESERVE STATIC INTERNAL IPV4 ADDRESS** from the **Primary internal IPv4 address** dropdown.

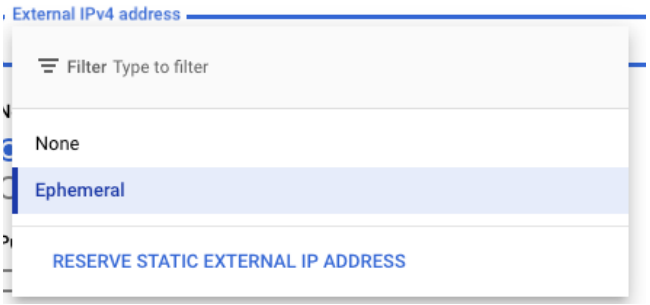


11. In the dialog window, enter a **Name** for the IP reservation.
12. Under **Static IP address**, you can leave it set to **Assign automatically** or choose an IP address if desired.
13. Click **RESERVE**.



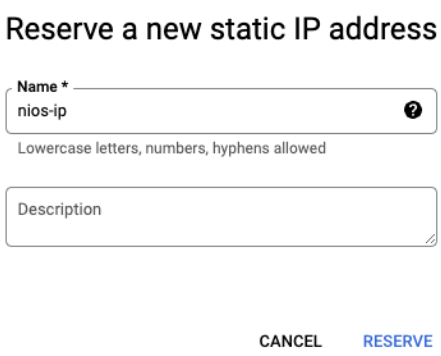
14. Select **RESERVE STATIC EXTERNAL IP ADDRESS** from the **External IPv4 address** dropdown.

Note: If you plan to connect to your vNIOS instance using VPN, Cloud Interconnect or another private method, you may not need an external IP address.



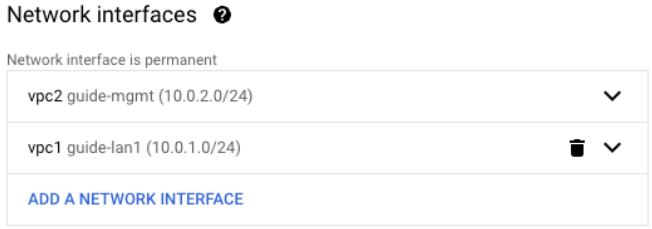
15. In the **Reserve a new static IP address** dialog, enter a name for the reservation.

16. Click **RESERVE**.



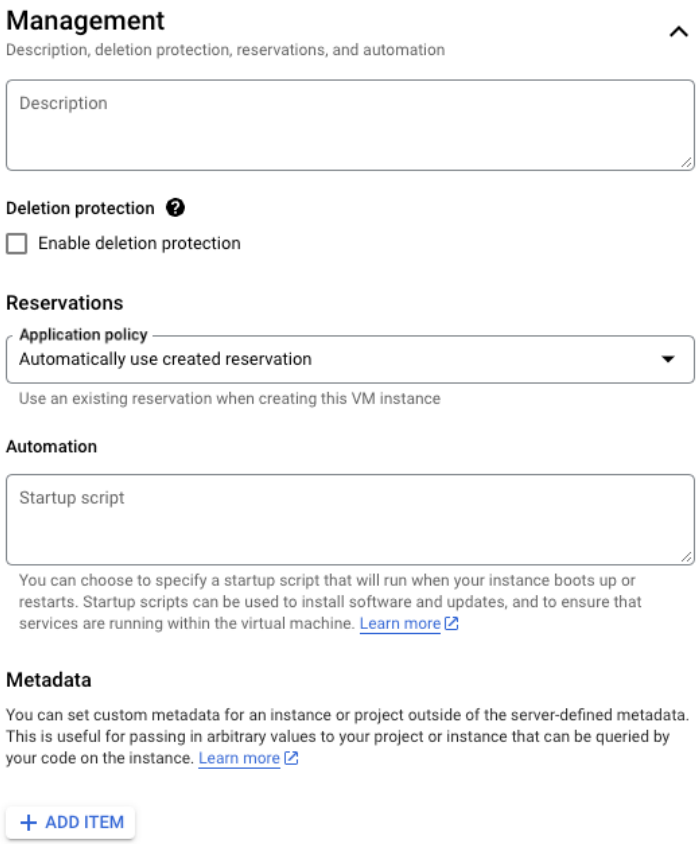
17. Click **DONE** for the new (LAN1) Network Interface.

You should now have two network interfaces for the VM, as shown below.



CONFIGURE USER DATA

1. Expand the Management panel.
2. Under **Metadata**, click **ADD ITEM**.



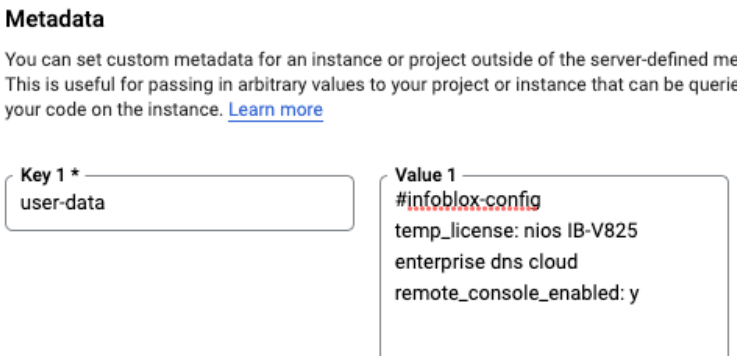
3. Enter **user-data** for **Key1**.
4. For **Value 1**, enter:

#infoblox-config

temp_license: nios IB-V825 enterprise dns dhcp cloud

remote_console_enabled: y

This will enable the SSH console and set temporary licenses for your vNIOS appliance. You should change the temporary license strings to reflect the vNIOS model you are deploying as well as appropriate service licenses. Refer to Infoblox Documentation for additional details. This is optional, as temporary and other licensing can be added later using the NIOS CLI.



5. Click **Create** to create the VM.

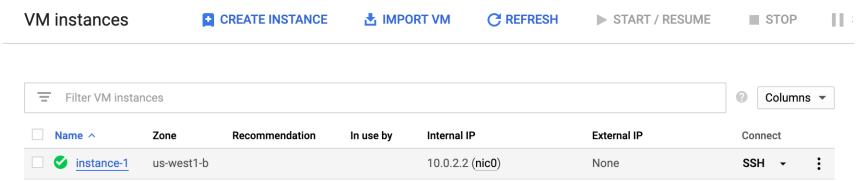
CONNECTING TO INFOBLOX vNIOS FOR GOOGLE CLOUD INSTANCE

Once your vNIOS for Google Cloud appliance has been successfully deployed, you are ready to begin testing and using it. There are three methods available to connect to your vNIOS for Google Cloud instance: virtual serial port, using SSH and the Grid Manager GUI. To use the serial port, you will first need to enable it. To connect via SSH or Grid Manager GUI, you will need to know the public IP address of your instance. It is also possible to connect to your instance using the private IP address over VPN or Cloud Interconnect/Direct Peering, however that is outside the scope of this guide.

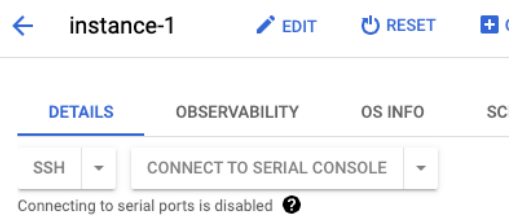
VIRTUAL SERIAL PORT

Follow the steps in this section to use the virtual serial port for your vNIOS for Google Cloud instance.

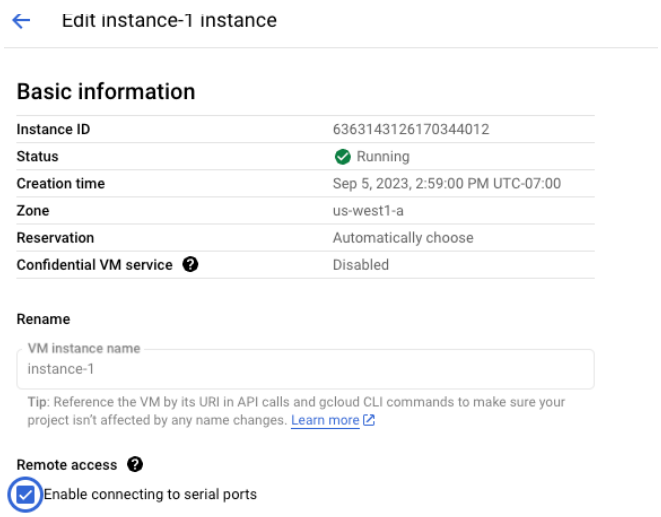
1. In the Google Cloud Console navigation menu, expand **Compute Engine**. Select **VM instances**.
2. Click on your new vNIOS instance.



3. Click **EDIT**.

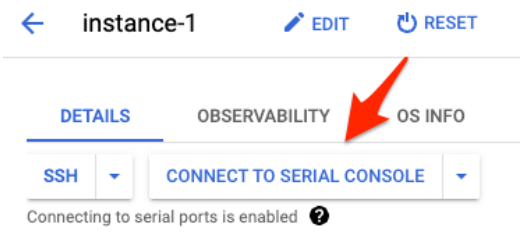


4. Click the checkbox to **Enable connecting to serial ports** under **Remote access**.

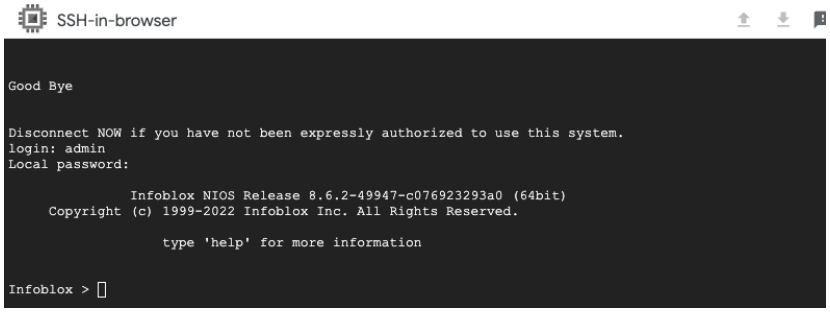


5. Scroll to the bottom of the page and click **Save**.

6. Back at the top of the VM instance details page, click **CONNECT TO SERIAL CONSOLE**.

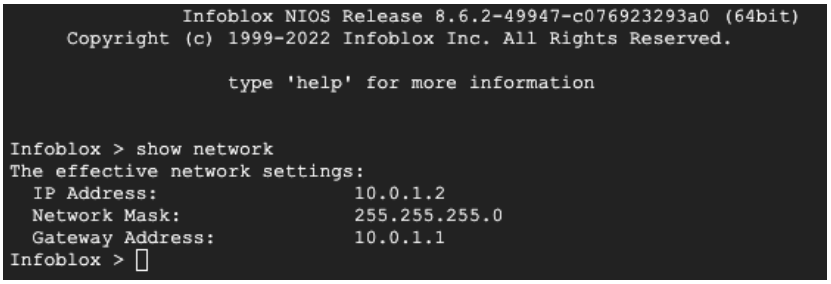


7. A new browser tab should open. This may take a few moments to connect as the console session is established with your Infoblox vNIOS for Google Cloud appliance.

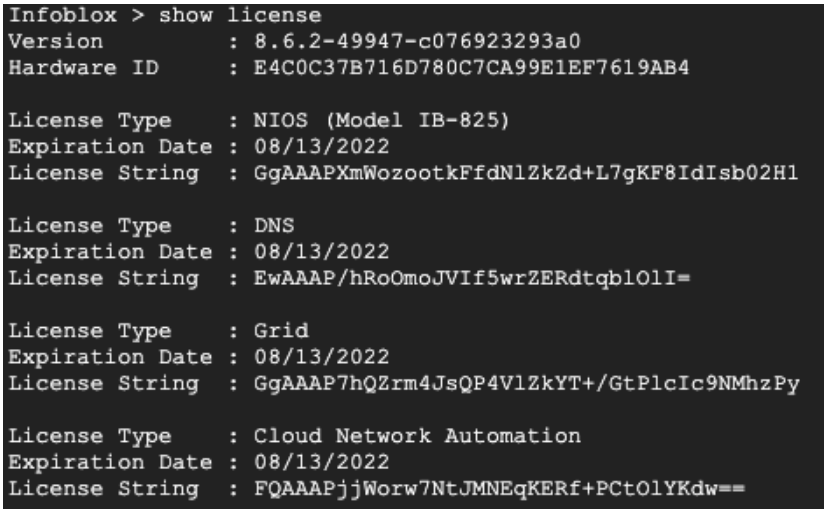


8. Log in using the default credentials (admin/infoblox).

9. Run the command **show network** to view the local network configuration.



10. Run the command **show license** to review any installed licenses.



11. You can use the **set temp_license** command to install additional temporary licenses if needed.

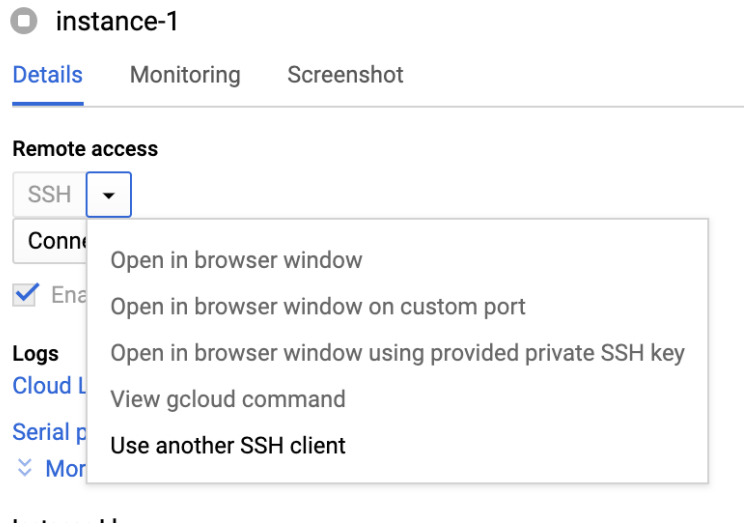
Note: This is not needed if you set the temporary licenses in user-data during VM creation.

```
Infoblox > set temp_license

 1. DNSone (DNS, DHCP)
 2. DNSone with Grid (DNS, DHCP, Grid)
 3. Network Services for Voice (DHCP, Grid)
 4. Add NIOS License
 5. Add DNS Server license
 6. Add DHCP Server license
 7. Add Grid license
 8. Add Microsoft management license
 9. Add Multi-Grid Management license
10. Add Query Redirection license
11. Add Threat Protection (Software add-on) license
12. Add Threat Protection Update license
13. Add Response Policy Zones license
14. Add FireEye license
15. Add DNS Traffic Control license
16. Add Cloud Network Automation license
17. Add Security Ecosystem license
18. Add Threat Analytics license
19. Add Flex Grid Activation license
20. Add Flex Grid Activation for Managed Services license

Select license (1-20) or q to quit:
```

12. For additional information on using the NIOS CLI, refer to https://docs.infoblox.com.
13. When you are done using the serial console, use the command **exit** and then close the browser tab.

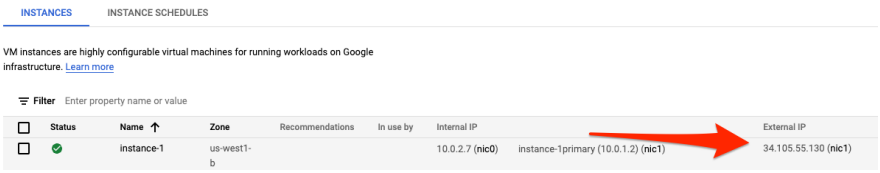
SSH

Google Cloud provides multiple methods for establishing SSH connection to VM instances as shown below. For additional information on using these connection methods, refer to https://cloud.google.com/compute/docs/instances/connecting-to-instance.

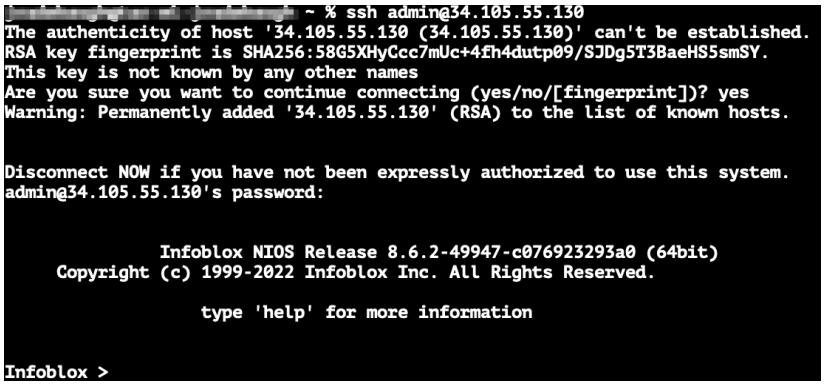


We will use a standard SSH client to connect for this guide. In order to connect via SSH, you will need to know the public IP address of your vNIOS for Google Cloud VM instance. To find the public IP address:

1. On the **VM INSTANCES** page in the Google Cloud Console, locate your instance and the **External IP**.

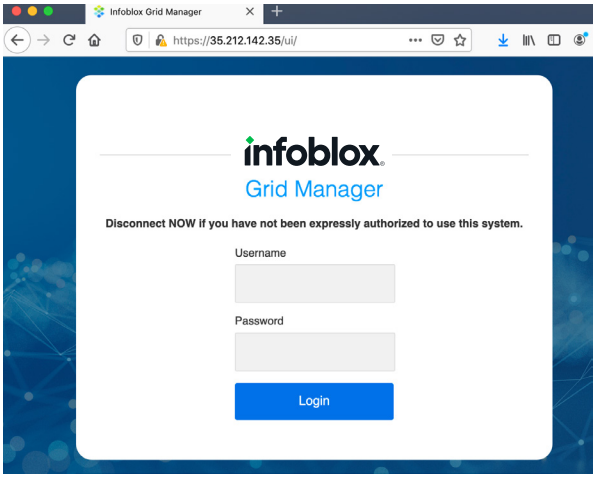


2. Click the copy icon to copy the external IP address.
   Once you have the public IP address, you are ready to connect via SSH.
3. Open a PowerShell or Terminal window on your computer (Putty or other SSH clients can also be used).
4. Enter the command **ssh admin@<ip_address>** to start the SSH connection (use the public IP address of your vNIOS instance).
5. When prompted, type **yes** to add the IP address to your known_hosts file.
6. Enter the password (default is infoblox)



GRID MANAGER

1. In your browser, navigate to **https://<ip_address>** (use the public IP address of your vNIOS instance).



Note: By default, NIOS uses a self-signed certificate. Warnings about the connection being insecure are to be expected and might require that you add an exception before being able to connect.

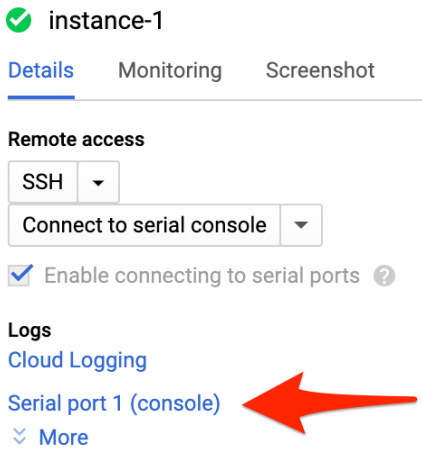
2. Log in with the username admin and the password specified during deployment.
3. Accept the Infoblox End-User License Agreement.
4. Read and make a selection for the Infoblox Customer Experience Improvement Program.

TROUBLESHOOTING

If you are unable to connect to your vNIOS for Google Cloud appliance, the first thing to check is that it started up successfully. The easiest way to do this is through the logs from the **Serial port 1** (**console**).

To check the Serial port logs:

1. On the **VM instance DETAILS** page, click on the **Serial port 1** (**console**) link.



2. The Serial port viewer will be displayed and show a history of input/output.

3. Review for any errors.
    a. If you see a fatal error duringt the Infoblox startup message, the system is unable to load all required resources. The most common cause for this is not attaching the required second network interface when using a version that requires it. To recover from this error, delete the VM and create a new one, making sure to use two network interfaces for the VM.
    b. If you see the system successfully started up and is sitting at the login prompt, then the issue is external from the appliance. You will need to verify all network settings and firewall rules in your Google Cloud environment.

ADDITIONAL RESOURCES

- Deployment Guide: Infoblox vDiscovery for Google Cloud: https://insights.infoblox.com/resources-deployment-guides/infoblox-deployment-guide-infoblox-v discovery-for-google-cloud.
- Infoblox NIOS and vNIOS Documentation: https://docs.infoblox.com.
- Google Cloud Compute Engine Documentation: https://cloud.google.com/compute/docs.
- Google Cloud VPC Documentation: https://cloud.google.com/vpc/docs.

Infoblox unites networking and security to deliver unmatched performance and protection. Trusted by Fortune 100 companies and emerging innovators, we provide real-time visibility and control over who and what connects to your network, so your organization runs faster and stops threats earlier.

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