



7. Deploy the Anthos Admin Workstation: NetApp HCI with Anthos

HCI

Dorian Henderson
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The admin workstation is a vSphere VM deployed within your NetApp HCI environment that is preinstalled with all the tools necessary to administer the Anthos on VMware solution. Follow the instructions in this section to download, deploy, and configure the Anthos admin workstation.



The admin workstation image is packaged as an OVA file and is only available for download to those users with whitelisted access service accounts. If you are unable to download the OVA from cloud storage, contact your project administrator or open a support ticket with Google Cloud support.

To deploy the Anthos admin workstation, complete the following steps:

1. Download the latest version of the virtual appliance [here](#). You must first set your account to the whitelisted access service account that has permission to download the OVA.

```
[user@rhel7 ~]$ gcloud config set account 'access-service-account@anthos-
dev.iam.gserviceaccount.com'
Updated property [core/account].
[user@rhel7 ~]$ gsutil cp gs://gke-on-prem-release/admin-appliance/1.1.1-gke.2/gke-on-
prem-admin-appliance-vsphere-1.1.1-gke.2.{ova,ova.sig} ~/
Copying gs://gke-on-prem-release/admin-appliance/1.1.1-gke.2/gke-on-prem-admin-
appliance-vsphere-1.1.1-gke.2.ova...
==> NOTE: You are downloading one or more large file(s), which would
run significantly faster if you enabled sliced object downloads. This
feature is enabled by default but requires that compiled crcmod be
installed (see "gsutil help crcmod").

- [0 files][ 40.2 MiB/ 5.1 GiB]
```

2. When the OVA file is downloaded, use `govc` to load it into your vCenter. You need to set several environment variables for your current user that provide specific information about your VMware vSphere environment deployed on NetApp HCI.



```
[user@rhel7 ~]$ export GOVC_URL=https://anthos-vc.cie.netapp.com/sdk
[user@rhel7 ~]$ export GOVC_USERNAME=administrator@vsphere.local
[user@rhel7 ~]$ export GOVC_PASSWORD=vcpassword
[user@rhel7 ~]$ export GOVC_DATASTORE=VM_Datastore
[user@rhel7 ~]$ export GOVC_DATACENTER=NetApp-HCI-Datcenter-01
[user@rhel7 ~]$ export GOVC_RESOURCE_POOL= Anthos-Resource-Pool
[user@rhel7 ~]$ export GOVC_INSECURE=true
```

3. Because the NetApp HCI deployment uses a vDS, you need to create a custom options file that you pass as an additional argument to govc. Create a file called `options_specs`, and commit the following information to the file:

```
cat > options_spec <<EOF
{
  "DiskProvisioning": "thin",
  "MarkAsTemplate": true,
  "NetworkMapping": [
    {
      "Name": "VM Network",
      "Network": [VM_Network]
    }
  ]
}
EOF
```

4. To import the OVA file as template in VMware vSphere, enter the following command referencing the downloaded virtual appliance file, as well as the options file that you just created. The console reports upload progress, and you can also verify the upload by browsing to the Recent Tasks window in VMware vSphere.

```
[user@rhel7 ~]$ govc import.ova -options options_spec .\gke-on-prem-admin-appliance-
vsphere-1.1.1-gke.2.ova
[06-11-19 10:56:39] Uploading gke-on-prem-admin-appliance-vsphere-1.1.1-gke.2.vmdk...
(23%, 26.8MiB/s)
```

Recent Tasks		Alarms		
Task Name	Target	Status	Initiator	
Deploy OVF template	 gke-on-prem-admin-a...	<div><div></div></div> 51%	VSPHERE.LOCAL\Adminis...	
Check new notifications	 anthos-vc.cie.netapp...	Completed	VMware vSphere Update ...	

5. With the template uploaded, we can now use Terraform to deploy the Anthos admin workstation

VM. Google provides a Terraform template and variable files for environments using DHCP as well those using static IP addresses. Create a directory for these Terraform files, and copy and paste the text for both the TF and TFVARS files available here into files created with a text editor.

```
[user@rhel7 ~]$ mkdir terraform
[user@rhel7 ~]$ cd terraform
[user@rhel7 ~]$ vi terraform.tfvars
```

6. See the following `terraform.tfvars` file contents.

```
# vCenter Server username
vcenter_user = "administrator@vsphere.local"

# vCenter Server password
vcenter_password = "vcpasssword"

# vCenter Server IP or hostname
vcenter_server = "https://anthos-vc.cie.netapp.com"

# Path in which the admin workstation's VM's public key should be saved
ssh_public_key_path = "~/ssh/vsphere_workstation.pub"

# Hostname for the VM
vm_name = "admin-workstation"

# vSphere datastore to use for storage
datastore = "VM_Datastore"

# vSphere datacenter in which to create the VM
datacenter = "NetApp-HCI-Datacenter-01"

# vSphere cluster in which to create the VM
cluster = "NetApp-HCI-Cluster-01"

# vSphere resource pool in which to create VM, if you are using a non-default resource
pool
# If you are using the default resource pool, provide a value like "CLUSTER-
NAME/Resources"
resource_pool = "Anthos-Resource-Pool"

# vSphere network to use for the VM
network = "VM_Network"

# Number of CPUs for this VM. Recommended minimum 4.
num_cpus = 4

# Memory in MB for this VM. Recommended minimum 8192.
memory = 8192

# The VM template (OVA) to clone. Change the version if you imported a different
version of the OVA.
vm_template = "gke-on-prem-admin-appliance-vmware-1.1.1-gke.2"

[user@rhel7 ~]$ vi terraform.tf
```

7. See the following `terraform.tf` file contents.

```
#####  
##### VARIABLES #####  
#####  
  
# The following variables are declared in the accompanying TFVARS file  
  
# vCenter Server username  
variable "vcenter_user" { }  
  
# vCenter Server password  
variable "vcenter_password" { }  
  
# vCenter Server address  
variable "vcenter_server" { }  
  
# Path in which the VM's public key should be saved  
variable "ssh_public_key_path" { default = "~/.ssh/vsphere_workstation.pub" }  
  
# vSphere network to use for the VM  
variable "network" { default = "VM Network"}  
  
# Hostname for the VM  
variable "vm_name" { default = "vsphere-workstation" }  
  
# vSphere datacenter in which to create the admin workstation VM  
variable "datacenter" { }  
  
# vSphere datastore to use for storage  
variable "datastore" { }  
  
# vSphere cluster in which to create the VM  
variable "cluster" { }  
  
# vSphere resource pool in which to create the VM  
variable "resource_pool" { }  
  
# Number of CPUs for this VM. Recommended minimum 4.  
variable "num_cpus" { default = 4 }  
  
# Memory in MB for this VM. Recommended minimum 8192.  
variable "memory" { default = 8192 }  
  
# The VM template (OVA) to clone  
variable "vm_template" { }
```

```
#####  
#####
```

```
provider "vsphere" {  
  version      = "~> 1.5"  
  user         = "${var.vcenter_user}"  
  password     = "${var.vcenter_password}"  
  vcenter_server = "${var.vcenter_server}"  
  
  # if you have a self-signed cert  
  allow_unverified_ssl = true  
}
```

```
### vSphere Data ###
```

```
data "vsphere_datastore" "datastore" {  
  name          = "${var.datastore}"  
  datacenter_id = "${data.vsphere_datacenter.dc.id}"  
}
```

```
data "vsphere_datacenter" "dc" {  
  name = "${var.datacenter}"  
}
```

```
data "vsphere_compute_cluster" "cluster" {  
  name          = "${var.cluster}"  
  datacenter_id = "${data.vsphere_datacenter.dc.id}"  
}
```

```
data "vsphere_resource_pool" "pool" {  
  name          = "${var.resource_pool}"  
  datacenter_id = "${data.vsphere_datacenter.dc.id}"  
}
```

```
data "vsphere_network" "network" {  
  name          = "${var.network}"  
  datacenter_id = "${data.vsphere_datacenter.dc.id}"  
}
```

```
data "vsphere_virtual_machine" "template_from_ovf" {  
  name          = "${var.vm_template}"  
  datacenter_id = "${data.vsphere_datacenter.dc.id}"  
}
```

```
data "template_file" "dhcp_ip_config" {  
  template = <<EOF  
network:
```



```

    version: 2
    ethernets:
        ens192:
            dhcp4: true
EOF
}

data "template_file" "user_data" {
    template = <<EOF
#cloud-config
apt:
    primary:
        - arches: [default]
        uri: http://us-west1.gce.archive.ubuntu.com/ubuntu/
write_files:
    - path: /etc/netplan/99-dhcp.yaml
      permissions: '0644'
      encoding: base64
      content: |
        ${dhcp_ip_config}
runcmd:
    - netplan apply
    - /var/lib/gke/guest-startup.sh
EOF
    vars = {
        dhcp_ip_config = "${base64encode(data.template_file.dhcp_ip_config.rendered)}"
    }
}

### vSphere Resources ###

resource "vsphere_virtual_machine" "vm" {
    name                = "${var.vm_name}"
    resource_pool_id    = "${data.vsphere_resource_pool.pool.id}"
    datastore_id        = "${data.vsphere_datastore.datastore.id}"
    num_cpus            = "${var.num_cpus}"
    memory              = "${var.memory}"
    guest_id            = "${data.vsphere_virtual_machine.template_from_ovf.guest_id}"
    enable_disk_uuid    = "true"
    scsi_type           = "${data.vsphere_virtual_machine.template_from_ovf.scsi_type}"
    network_interface {
        network_id      = "${data.vsphere_network.network.id}"
        adapter_type     =
"${data.vsphere_virtual_machine.template_from_ovf.network_interface_types[0]}"
    }

    wait_for_guest_net_timeout = 15

```

```

nested_hv_enabled = false
cpu_performance_counters_enabled = false

disk {
  label          = "disk0"
  size           = "${max(50,
data.vsphere_virtual_machine.template_from_ovf.disks.0.size)}"
  eagerly_scrub  =
"${data.vsphere_virtual_machine.template_from_ovf.disks.0.eagerly_scrub}"
  thin_provisioned =
"${data.vsphere_virtual_machine.template_from_ovf.disks.0.thin_provisioned}"
}

cdrom {
  client_device = true
}

vapp {
  properties = {
    hostname     = "${var.vm_name}"
    public-keys  = "${file(var.ssh_public_key_path)}"
    user-data    = "${base64encode(data.template_file.user_data.rendered)}"
  }
}

clone {
  template_uuid = "${data.vsphere_virtual_machine.template_from_ovf.id}"
}

output "ip_address" {
  value = "${vsphere_virtual_machine.vm.default_ip_address}"
}

```



Values specific to the deployed environment have been added to the terraform.tfvars file. However, you should not modify the terraform.tf file in any manner.

8. Create an SSH public/private keypair used to log in to the admin workstation after it is deployed. Name the public key so that it matches the variable that was assigned in the `terraform.tfvars` file.

```

[user@rhel7 ~]$ ssh-keygen -t rsa -f ~/.ssh/vsphere_workstation -N ""
Generating public/private rsa key pair.
Your identification has been saved in /home/user/.ssh/vsphere_workstation2.
Your public key has been saved in /home/user/.ssh/vsphere_workstation2.pub.
The key fingerprint is:
SHA256:qEk8G13LhwiKqf85ekHHZkIZduX2MkZUxGNEHvFT2vw user@rhel7
The key's randomart image is:
+---[RSA 2048]---+
|    oo.o+*B.  .  |
|    .o. o .+o =  |
|    ... B.o.+ o  |
| o 000=B *    .  |
|o ..==+ S .    E|
|.  ..*    .    |
|.  +.        |
|.  o.        |
|  o+o.       |
+-----[SHA256]-----+

```

9. Navigate to the directory created to host the TF and TFVARS files. Within this directory, initialize Terraform and use it to launch the deployment of the admin workstation VM.

```
[user@rhel7 ~]$ cd terraform
[user@rhel7 terraform]$ ls
terraform.tf  terraform.tfvars
[user@rhel7 terraform]$ terraform init && terraform apply -auto-approve -input=false
Initializing the backend...
Initializing provider plugins...
The following providers do not have any version constraints in configuration,
so the latest version was installed.
To prevent automatic upgrades to new major versions that may contain breaking
changes, it is recommended to add version = "..." constraints to the
corresponding provider blocks in configuration, with the constraint strings
suggested below.
* provider.template: version = "~> 2.1"
Terraform has been successfully initialized!
```

```
data.template_file.dhcp_ip_config: Refreshing state...
data.template_file.user_data: Refreshing state...
data.vsphere_datacenter.dc: Refreshing state...
data.vsphere_resource_pool.pool: Refreshing state...
data.vsphere_datastore.datastore: Refreshing state...
data.vsphere_virtual_machine.template_from_ovf: Refreshing state...
data.vsphere_network.network: Refreshing state...
data.vsphere_compute_cluster.cluster: Refreshing state...
vsphere_virtual_machine.vm: Creating...
vsphere_virtual_machine.vm: Still creating... [10s elapsed]
vsphere_virtual_machine.vm: Still creating... [20s elapsed]
vsphere_virtual_machine.vm: Still creating... [30s elapsed]
vsphere_virtual_machine.vm: Still creating... [40s elapsed]
vsphere_virtual_machine.vm: Creation complete after 49s [id=42118cfa-d464-b815-f7b1-37cd85b2943a]
```

Warning: "vcenter_server": [DEPRECATED] This field has been renamed to vsphere_server.

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

Outputs:

ip_address = 10.63.172.21

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