9. Deploy Additional User Clusters: NetApp HCI with Anthos

NetApp Solutions

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With Anthos, organizations can scale their environments to incorporate multiple user clusters and segregate workloads between teams. A single admin cluster can support up to five user clusters, and each user cluster can support up to twenty-five nodes.

To add additional user clusters to your deployment, complete the following steps:

1. Copy the `config.yaml` file to a new file named `anthos-cluster02-config.yaml`.

```
ubuntu@Anthos-Admin-Workstation:~$ cp config.yaml anthos-cluster02-
config.yaml
```

2. Make the following edits to the newly created file:
    1. Comment out the sections that refer to the existing admin cluster with (#).
    2. When you get to the `usercluster` section, update the following fields:
        1. Update the partition name under the `bigip` section.
        2. Update the `controlplanvip` and `ingressvip` values under the `vip` section.
        3. Update the `clustername` value.

```
 usercluster:
  # In-Cluster vCenter configuration
  vcenter:
    # If specified it overwrites the network field in global
vcenter configuration
    network: ""
  # # The absolute or relative path to the yaml file to use for
static IP allocation.
  # # Do not include if using DHCP
  # ipblockfilepath: ""
  # # Specify pre-defined nodeports if using "manual" load
balancer mode
  # manuallbspec:
  #   ingresshttpnodeport: 30243
  #   ingresshttpsnodeport: 30879
  #   controlplanenodeport: 30562
  #   addonsnodeport: 0
  # Specify the already-existing partition and credentials to use
with F5
  bigip:
    # To re-use credentials across clusters we recommend using
YAML node anchors.
```

```
    # See https://yaml.org/spec/1.2/spec.html#id2785586
    credentials:
      address: "172.21.224.22"
      username: "admin"
      password: "NetApp!23"
    partition: "Anthos-Cluster02-Part"
    # # Optionally specify a pool name if using SNAT
    # snatpoolname: ""
  # The VIPs to use for load balancing
  vips:
    # Used to connect to the Kubernetes API
    controlplanevip: "10.63.172.108"
    # Shared by all services for ingress traffic
    ingressvip: "10.63.172.109"
    # # Used for admin cluster addons (needed for multi cluster
features). Must be the same
    # # across clusters
    # addonsvip: ""
  # A unique name for this cluster
  clustername: "anthos-cluster02"
  # User cluster master nodes must have either 1 or 3 replicas
  masternode:
    cpus: 4
    memorymb: 8192
    # How many machines of this type to deploy
    replicas: 1
  # The number of worker nodes to deploy and their size. Min. 2
replicas
  workernode:
    cpus: 4
    memorymb: 8192
    # How many machines of this type to deploy
    replicas: 3
  # The Kubernetes service CIDR range for the cluster
  serviceiprange: 10.96.0.0/12
  # The Kubernetes pod CIDR range for the cluster
  podiprange: 192.168.0.0/16
```

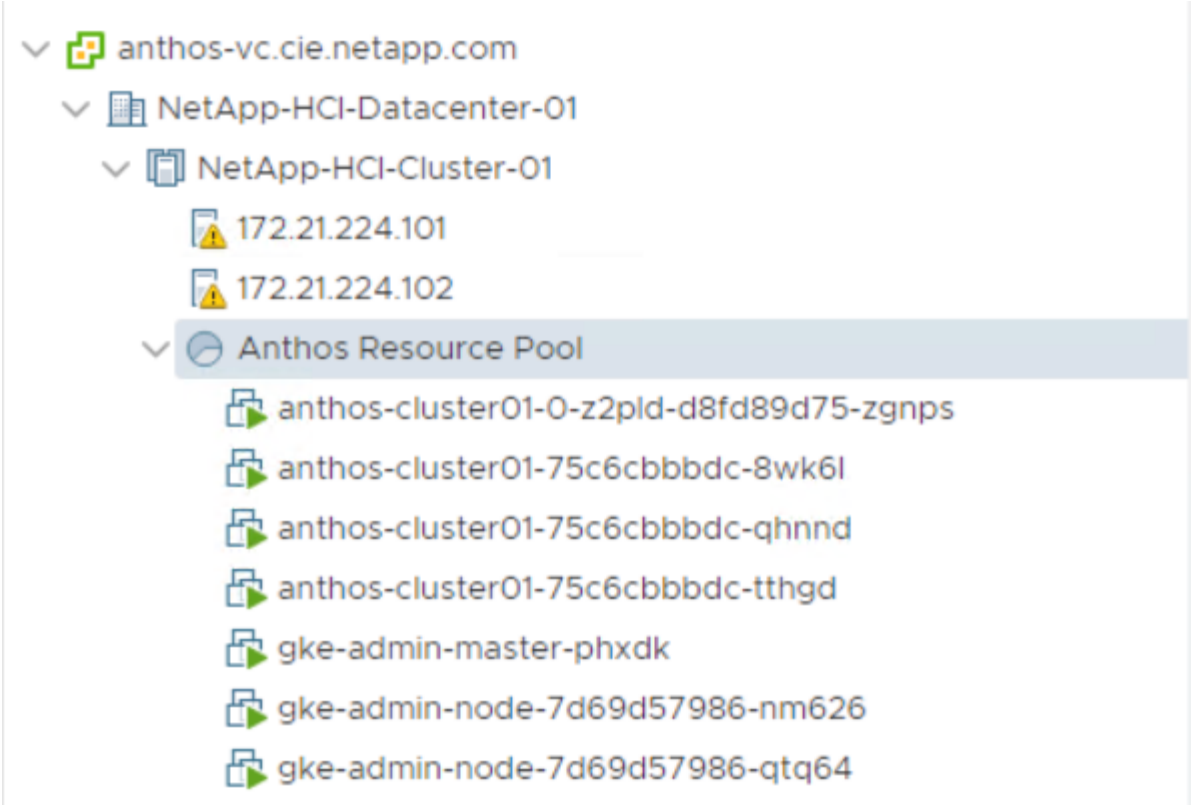
3. Run the following command to check the config file again to verify that there are no syntax errors. Because you have removed the admin section, you must reference the `kubeconfig` file for the admin cluster named `kubeconfig` (found in the working directory).

```
ubuntu@Anthos-Admin-Workstation:~$ gkectl check-config --config anthos-
cluster02-config.yaml --kubeconfig kubeconfig
- Validation Category: Config Check
    - [SUCCESS] Config

- Validation Category: Docker Registry
    - [SUCCESS] gcr.io/gke-on-prem-release access

- Validation Category: vCenter
    - [SUCCESS] Credentials
    - [SUCCESS] Datacenter
    - [SUCCESS] Datastore
    - [FAILURE] Data Disk: vCenter data disk already exists
    - [SUCCESS] Resource Pool
    - [SUCCESS] Network

- Validation Category: F5 BIG-IP
    - [SUCCESS] Credentials
    - [SUCCESS] Partition

- Validation Category: Network Configuration
    - [SUCCESS] CIDR, VIP and static IP (availability and overlapping)

- Validation Category: VIPs
    - [SUCCESS] ping (availability)

- Validation Category: Node IPs
    - [SUCCESS] ping (availability)

Some validations FAILED or SKIPPED. Check report above.
```

4. If all the checks succeed as expected, you can deploy this new user cluster in a manner very similar to the first cluster creation, referencing the `kubeconfig` file from the admin cluster.

```
ubuntu@Anthos-Admin-Workstation:~$ gkectl create cluster --config
anthos-cluster02-config.yaml --kubeconfig kubeconfig
```

5. As with the previous deployment, the process runs for several minutes and can be monitored on screen and in vCenter by watching the resource pool as the VMs populate. When complete, you should be able to see the new user cluster (four nodes).



6. You can access and execute commands against the deployed user cluster using the kubectl command line tool and the `kubeconfig` file generated by the process (stored in the working directory).

```
ubuntu@Anthos-Admin-Workstation:~$ kubectl get nodes --kubeconfig
anthos-cluster02-kubeconfig
NAME                                  STATUS   ROLES    AGE     VERSION
anthos-cluster02-84744f5bd8-8rqk6   Ready    <none>   9m16s   v1.13.7-
gke.20
anthos-cluster02-84744f5bd8-fl786   Ready    <none>   9m28s   v1.13.7-
gke.20
anthos-cluster02-84744f5bd8-fnsmp   Ready    <none>   9m21s   v1.13.7-
gke.20
```