Configure NetApp H615c (Manual Deployment)

NetApp Solutions

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February 19, 2021

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Configure NetApp H615c (Manual Deployment)

In this solution, the NetApp H615c compute nodes are configured as Kubernetes worker nodes. The Inferencing workload is hosted on these nodes.

Deploying the compute nodes involves the following tasks:

- Install Ubuntu 18.04.4 LTS.
- Configure networking for data and management access.
- Prepare the Ubuntu instances for Kubernetes deployment.

Install Ubuntu 18.04.4 LTS

The following high-level steps are required to install the operating system on the H615c compute nodes:

1. Download Ubuntu 18.04.4 LTS from Ubuntu releases.
2. Using a browser, connect to the IPMI of the H615c node and launch Remote Control.
3. Map the Ubuntu ISO using the Virtual Media Wizard and start the installation.
4. Select one of the two physical interfaces as the `Primary network interface` when prompted.

   An IP from a DHCP source is allocated when available, or you can switch to a manual IP configuration later. The network configuration is modified to a bond-based setup after the OS has been installed.
5. Provide a hostname followed by a domain name.
6. Create a user and provide a password.
7. Partition the disks according to your requirements.
8. Under Software Selection, select `OpenSSH server` and click Continue.
9. Reboot the node.

Configure Networking for Data and Management Access

The two physical network interfaces of the Kubernetes worker nodes are set up as a bond and VLAN interfaces for management and application, and NFS data traffic is created on top of it.

The inferencing applications and associated containers use the application network for connectivity.

1. Connect to the console of the Ubuntu instance as a user with root privileges and launch a terminal session.
2. Navigate to `/etc/netplan` and open the `01-netcfg.yaml` file.
3. Update the netplan file based on the network details for the management, application, and NFS traffic in your environment.

   The following template of the netplan file was used in this solution:

```
# This file describes the network interfaces available on your system
```

```
# For more information, see netplan(5).
network:
  version: 2
  renderer: networkd
  ethernets:
    enp59s0f0: #Physical Interface 1
      match:
        macaddress: <<mac_address Physical Interface 1>>
      set-name: enp59s0f0
      mtu: 9000
    enp59s0f1: # Physical Interface 2
      match:
        macaddress: <<mac_address Physical Interface 2>>
      set-name: enp59s0f1
      mtu: 9000
  bonds:
      bond0:
        mtu: 9000
        dhcp4: false
        dhcp6: false
        interfaces: [ enp59s0f0, enp59s0f1 ]
        parameters:
          mode: 802.3ad
          mii-monitor-interval: 100
  vlans:
    vlan.3488: #Management VLAN
      id: 3488
      xref:{relative_path}bond0
      dhcp4: false
      addresses: [ipv4_address/subnet]
      routes:
      - to: 0.0.0.0/0
        via: 172.21.232.111
        metric: 100
        table: 3488
      - to: x.x.x.x/x # Additional routes if any
        via: y.y.y.y
        metric: <<metric>>
        table: <<table #>>
      routing-policy:
      - from: 0.0.0.0/0
        priority: 32768#Higher Priority than table 3487
        table: 3488
      nameservers:
        addresses: [nameserver_ip]
        search: [ search_domain ]
```

```
      mtu: 1500
    vlan.3487:
      id: 3487
      xref:{relative_path}bond0
      dhcp4: false
      addresses: [ipv4_address/subnet]
      routes:
      - to: 0.0.0.0/0
        via: 172.21.231.111
        metric: 101
        table: 3487
      - to: x.x.x.x/x
        via: y.y.y.y
        metric: <<metric>>
        table: <<table #>>
      routing-policy:
      - from: 0.0.0.0/0
        priority: 32769#Lower Priority
        table: 3487
      nameservers:
        addresses: [nameserver_ip]
        search: [ search_domain ]
      mtu: 1500    vlan.3491:
      id: 3491
      xref:{relative_path}bond0
      dhcp4: false
      addresses: [ipv4_address/subnet]
      mtu: 9000
```

4. Confirm that the priorities for the routing policies are lower than the priorities for the main and default tables.
5. Apply the netplan.

```
sudo netplan --debug apply
```

6. Make sure that there are no errors.
7. If Network Manager is running, stop and disable it.

```
systemctl stop NetworkManager
systemctl disable NetworkManager
```

8. Add a host record for the server in DNS.
9. Open a VI editor to `/etc/iproute2/rt_tables` and add the two entries.

```
#
# reserved values
#
255     local
254     main
253     default
0       unspec
#
# local
#
#1      inr.ruhep
101     3488
102     3487
```

10. Match the table number to what you used in the netplan.
11. Open a VI editor to `/etc/sysctl.conf` and set the value of the following parameters.

```
net.ipv4.conf.default.rp_filter=0
net.ipv4.conf.all.rp_filter=0net.ipv4.ip_forward=1
```

12. Update the system.

```
sudo apt-get update && sudo apt-get upgrade
```

13. Reboot the system
14. Repeat steps 1 through 13 for the other Ubuntu instance.

Next: Set Up the Deployment Jump and the Kubernetes Master Node VMs (Manual Deployment)