Installing UFM on Bare Metal Server - High Availability Mode

Before installing UFM server software in High-Availability mode, ensure that the Additional Prerequisites for UFM High Availability Installation are met.

The UFM High-Availability configuration requires dual-link connectivity based on two separate interfaces between the two UFM HA nodes. This configuration comprises of a primary link that is exclusively reserved for DRBD operations and a secondary link designated for backup purposes. Crucially, it is imperative that communication between the servers is established in a bidirectional manner across both interfaces and validated through user-initiated testing, such as a 'ping' command or other suitable alternatives before HA configuration can be implemented. In cases where only one link is available among the two UFM HA nodes/servers, manually configure UFM with a single link. Refer to Configure HA without SSH Trust (Single Link Configuration).

> ⓘ **Note**
>
> UFM HA package requires a dedicated partition with the same name for DRBD on both servers. This guide uses `/dev/sda5` as an example.

1. On both servers, Install UFM Enterprise in Stand Alone (SA) mode.

   > ⓘ **Note**
   >
   > Do not start UFM service.

2. Install the latest pcs and drbd-utils drivers on both servers.

   For Ubuntu:

   ```
   apt install pcs pacemaker drbd-utils
   ```

For CentOS/Red Hat:

```
yum install pcs pacemaker drbd84-utils kmod-drbd84
```

OR

```
yum install pcs pacemaker drbd90-utils kmod-drbd90
```

3. Download UFM-HA latest package from using this command:

```
wget https://www.mellanox.com/downloads/UFM/ufm_ha_5.5.0-9.tgz
```

For Sha256:

```
wget https://download.nvidia.com/ufm/ufm_ha/ufm_ha_5.5.0-9.sha256
```

> ⓘ **Note**
>
> For more information on the UFM-HA package and all installation and configuration options, please refer to UFM High-Availability User Guide.

4. Extract the downloaded UFM-HA package on both servers under /tmp/.

5. Go to the directory you extracted /tmp/ufm_ha_XXX and run the installation script. For example, if your DRBD partition is /dev/sda5 run:

```
./install.sh -l /opt/ufm/files/ -d /dev/sda5 -p enterprise
```

6. Configure the HA cluster. There are the three methods:

- Configure HA with SSH Trust (Dual Link Configuration) - Requires passwordless SSH connection between the servers.

- Configure HA without SSH Trust (Dual Link Configuration) - Does not require passwordless SSH connection between the servers, but asks you to run configuration commands on both servers.

- Configure HA without SSH Trust (Single Link Configuration) - Can be used in cases where only one link is available among the two UFM HA nodes/servers.

Configure HA with SSH Trust (Dual Link Configuration)

1.

    1. On the **master server only**, configure the HA nodes. To do so, from /tmp, run the configure_ha_nodes.sh command as shown in the below example

    ```
    configure_ha_nodes.sh \
    --cluster-password 12345678 \
    --master-primary-ip 10.10.10.1 \
    --standby-primary-ip 10.10.10.2 \
    --master-secondary-ip 192.168.10.1 \
    --standby-secondary -ip 192.168.10.2 \
    --no-vip
    ```

    > ⓘ **Note**
    >
    > The script configure_ha_nodes.sh is is located under /usr/local/bin/, therefore, by default, you do not need to use the full path to run it.

    > ⓘ **Note**

The --cluster-password must be at least 8 characters long.

> **ⓘ Note**
>
> To set up a Virtual IP for UFM and gain access to UFM through this IP, regardless of which server is running UFM, you may employ the --no-vip OR --virtual-ip command and provide an IP address as an argument. This can be achieved by navigating to https://<Virtual-IP>/ufm on your web browser.

> **ⓘ Note**
>
> When using back-to-back ports with local IP addresses for HA sync interfaces, ensure that you add your IP addresses and hostnames to the /etc/hosts file. This is needed to allow the HA configuration to resolve hostnames correctly based on the IP addresses you are using.

> **ⓘ Note**
>
> configure_ha_nodes.sh requires SSH connection to the standby server. If SSH trust is not configured, then you are prompted to enter the SSH password of the standby server during configuration runtime

2. Depending on the size of your partition, wait for the configuration process to complete and DRBD sync to finish.

Configure HA without SSH Trust (Dual Link Configuration)

If you cannot establish an SSH trust between your HA servers, you can use **ufm_ha_cluster directly to configure HA. To configure HA, follow the below instructions:**

> ⓘ **Note**
>
> Please change the variables in the commands below based on your setup.

1.

    1. [On Standby Server] Run the following command to configure Standby Server:

    ```
    ufm_ha_cluster config -r standby \
    --local-primary-ip 10.10.50.1 \
    --peer-primary-ip 10.10.50.2 \
    --local-secondary-ip 192.168.10.1 \
    --peer-secondary-ip 192.168.10.2 \
    --hacluster-pwd 123456789 \
    --no-vip
    ```

    2. [On Master Server] Run the following command to configure Master Server:

    ```
    ufm_ha_cluster config -r master --local-primary-ip 10.10.50.1 \
    --peer-primary-ip 10.10.50.2 \
    --local-secondary-ip 192.168.10.1 \
    --peer-secondary-ip 192.168.10.2 \
    --hacluster-pwd 123456789 \
    --no-vip
    ```

    You must wait until after configuration for DRBD sync to finish, depending on the size of your partition. To check the DRBD sync status, run:

```
ufm_ha_cluster status
```

Configure HA without SSH Trust (Single Link Configuration)

> ⚠️ **Warning**
>
> This is not the recommended configuration and, in case of network failure, it might cause HA cluster split brain.

If you cannot establish an SSH trust between your HA servers, you can use **ufm_ha_cluster directly to configure HA. To configure HA, follow the below instructions:**

> ⓘ **Note**
>
> Please change the variables in the commands below based on your setup.

1.

    1. [On Standby Server] Run the following command to configure Standby Server:

    ```
    ufm_ha_cluster config \
    -r standby \
    -e 10.212.145.5 \
    -l 10.212.145.6 \
    --enable-single-link
    ```

    2. [On Master Server] Run the following command to configure Master Server:

```
ufm_ha_cluster config -r master \
-e 10.212.145.6 \
-l 10.212.145.5 \
-i 10.212.145.50 \
--enable-single-link
```

You must wait until after configuration for DRBD sync to finish, depending on the size of your partition. To check the DRBD sync status, run:

```
ufm_ha_cluster status
```

Starting HA Cluster

- To start UFM HA cluster:

```
ufm_ha_cluster start
```

- To check UFM HA cluster status:

```
ufm_ha_cluster status
```

Stopping UFM HA cluster:

```
ufm_ha_cluster stop
```

> **ⓘ Note**
>
> For complete details on high availability, refer to NVIDIA UFM High-Availability User Guide.