DEVCONF.cz

Manage storage easily with Linux System Roles

Vojtech Trefny
vtrefny@redhat.com

Linux System Roles

- A set of Ansible roles used to manage and configure common GNU/Linux components.
- Multiple subsystems are supported – selinux, network, firewall, postfix...
- Available in **`rhel-system-roles`** on RHEL and **`linux-system-roles`** on Fedora or in Ansible Galaxy[1].

https://linux-system-roles.github.io/

[1] https://galaxy.ansible.com/linux-system-roles

Storage Role

System role for storage configuration

Supported technologies

- LVM, including LVM RAID, thin provisioning, cache and deduplication and compression with VDO
- Software RAID with MD
- LUKS encryption
- Partition management
- Filesystem management including resizing and fstab management

```
storage_pools:
    - name: fedora
      disks:
        - vda
      volumes:
        - name: root
          fs_type: ext4
          size: 53.1 GiB
          mount_point: /
        - name: home
          fs_type: ext4
          size: 25.9 GiB
          mount_point: /home
```

Default Fedora installation with LVM

LVM volume group called “fedora” on top of one disk with two logical volumes “root” mounted on / and “home” mounted on /home

```
storage_pools:
    - name: fedora
      disks:
        - vda
      volumes:
        - name: root
          fs_type: ext4
          size: 53.1 GiB
          mount_point: /
        - name: home
          fs_type: ext4
          size: 25.9 GiB
          mount_point: /home
```

```
[root@fedora ~]# lsblk /dev/vda
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
vda             252:0    0   80G  0 disk
├─vda1          252:1    0    1M  0 part
├─vda2          252:2    0    1G  0 part /boot
└─vda3          252:3    0   79G  0 part
  ├─fedora-root 253:0    0 53.1G  0 lvm  /
  └─fedora-home 253:1    0 25.9G  0 lvm  /home
```

```
storage_pools:
    - name: fedora
      disks:
        - vda
        - vdb
      volumes:
        - name: root
          fs_type: ext4
          mount_point: /
        - name: home
          size: 100 GiB
          fs_type: ext4
          mount_point: /home
```

More realistic use case

We bought a new drive and want to add it to our existing volume group and resize our /home

```
storage_pools:
  - name: fedora
    disks:
      - vda
      - vdb
    volumes:
      - name: root
        fs_type: ext4
        mount_point: /
      - name: home
        size: 100 GiB
        fs_type: ext4
        mount_point: /home
```

```
[root@fedora ~]# lsblk /dev/vd[ab]
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
vda                 252:0    0   80G  0 disk
├─vda1              252:1    0    1M  0 part
├─vda2              252:2    0    1G  0 part /boot
└─vda3              252:3    0   79G  0 part
  ├─fedora-root     253:0    0 53.1G  0 lvm  /
  └─fedora-home     253:1    0  100G  0 lvm  /home
vdb                 252:16   0   80G  0 disk
└─vdb1              252:17   0   80G  0 part
  └─fedora-home     253:1    0  100G  0 lvm  /home
```

```
storage_pools:
  - name: fedora
    disks:
      - vda
      - vdb
      - nvme0n1
    volumes:
      - name: root
        fs_type: ext4
        mount_point: /
        cached: true
        cache_size: 5 GiB
        cache_devices: nvme0n1
```

More realistic use case 2

We bought another new drive, this time it's a fancy fast NVMe and we want to use it to speed up our root filesystem with LVM cache.

```
storage_pools:
  - name: fedora
    disks:
      - vda
      - vdb
      - nvme0n1
    volumes:
      - name: root
        fs_type: ext4
        mount_point: /
        cached: true
        cache_size: 5 GiB
        cache_devices: nvme0n1
```

```
[root@fedora ~]# lsblk /dev/vd[ab] /dev/nvme0n1
NAME                          MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
vda                           252:0    0   80G  0 disk
├─vda1                        252:1    0    1M  0 part
├─vda2                        252:2    0    1G  0 part /boot
└─vda3                        252:3    0   79G  0 part
  ├─fedora-home               253:1    0  100G  0 lvm  /home
  └─fedora-root_corig         253:4    0 53.1G  0 lvm
    └─fedora-root             253:0    0 53.1G  0 lvm  /
vdb                           252:16   0   80G  0 disk
└─vdb1                        252:17   0   80G  0 part
  └─fedora-home               253:1    0  100G  0 lvm  /home
nvme0n1                       259:1    0   10G  0 disk
└─nvme0n1p1                   259:3    0   10G  0 part
  ├─fedora-pool00_cpool_cdata 253:2    0    5G  0 lvm
  │ └─fedora-root             253:0    0 53.1G  0 lvm  /
  └─fedora-pool00_cpool_cmeta 253:3    0    8M  0 lvm
    └─fedora-root             253:0    0 53.1G  0 lvm  /
```

```
vars:
   storage_safe_mode: false
...
      storage_pools:
        - name: fedora
          disks:
            - vda
            - vdb
          volumes:
            - name: root
              fs_type: ext4
              mount_point: /
              cached: false
```

More realistic use case 3

We no longer want to use the NVMe drive for caching. Lets remove it.

```
vars:
    storage_safe_mode: false
...
      storage_pools:
        - name: fedora
          disks:
            - vda
            - vdb
          volumes:
            - name: root
              fs_type: ext4
              mount_point: /
              cached: false
```

```
[root@fedora ~]# lsblk /dev/vd[ab] /dev/nvme0n1
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
vda             252:0    0   80G  0 disk
├─vda1          252:1    0    1M  0 part
├─vda2          252:2    0    1G  0 part /boot
└─vda3          252:3    0   79G  0 part
  ├─fedora-root 253:0    0 53.1G  0 lvm  /
  └─fedora-home 253:1    0  100G  0 lvm  /home
vdb             252:16   0   80G  0 disk
└─vdb1          252:17   0   80G  0 part
  └─fedora-home 253:1    0  100G  0 lvm  /home
nvme0n1         259:1    0   10G  0 disk
└─nvme0n1p1     259:3    0   10G  0 part
```

What’s next?

- Coming soon (RHEL 8.9/9.3)
  - Filesystem online resize
  - Mount point owner and permission
- In the future
  - More “configuration” options for existing storage.
  - More storage technologies: Stratis, btrfs...
  - Snapshots

Thank you for your attention

- WWW
  - https://linux-system-roles.github.io/
  - https://galaxy.ansible.com/linux-system-roles
- GitHub
  - System roles: https://github.com/linux-system-roles
  - Storage role: https://github.com/linux-system-roles/storage
- Contact:
  - systemroles@lists.fedorahosted.org
  - vtrefny@redhat.com