Advanced Storage - Stratis

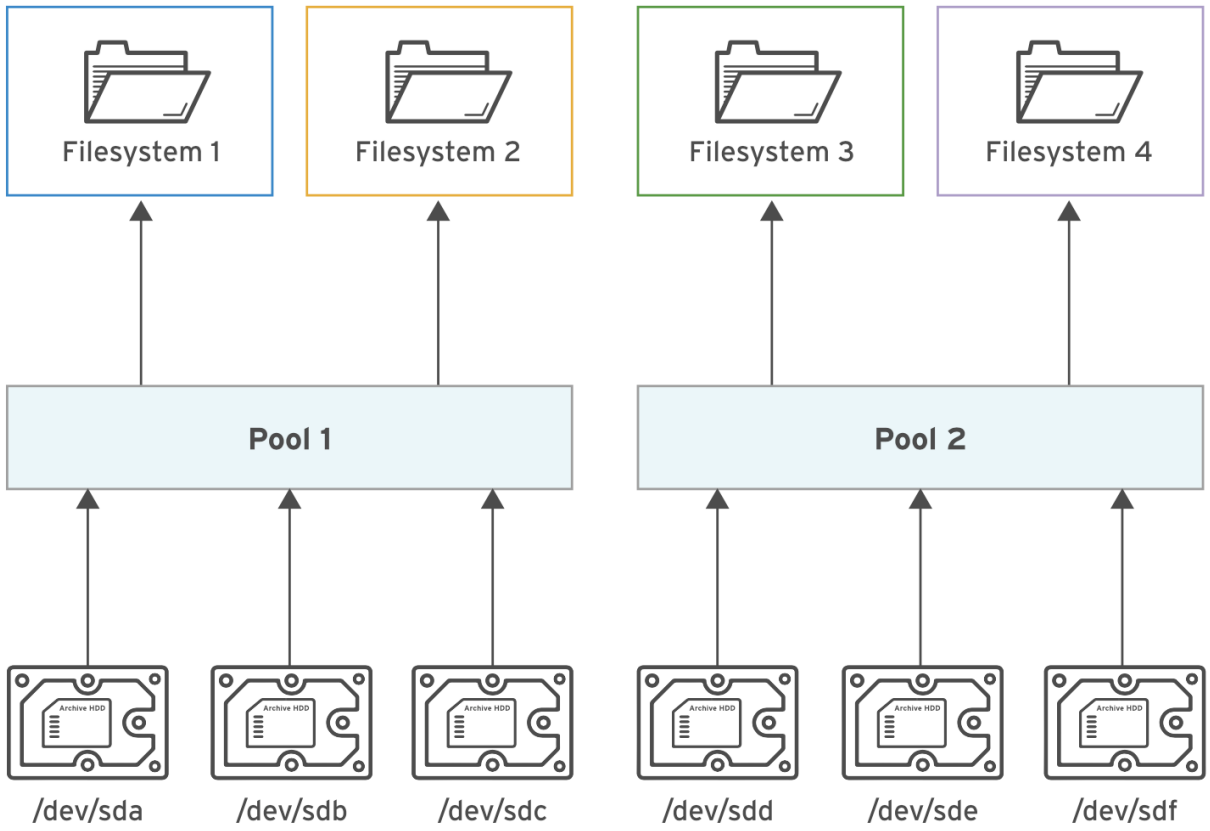
Unit objectives

After completing this unit, you should be able to:

- Understand Architecture of Stratis
- Working with Stratis Storage
- Working with Stratis File Systems
- Working with Stratis Snapshots

Understand Architecture of Stratis

- New local storage-management in v8
- Easier initial configuration
- As at writing, is available as Technology Preview
- Stratis runs as a service
- Filesystem formatted with XFS



The Beauty

Enhancements

- File System Snapshots
- Thin Provisioning
- Tiering – add-cache subcommand
- Programming APIs

Supported Device

- HDDs and SSDs
- NVMe devices
- LVM LV
- MD RAID
- DM Multipath
- iSCSI

Working with Stratis Storage

- Install necessary package

```
# dnf –y install stratis-cli stratisd
```

- Stratis daemon

- handles reconfiguration requests

- manages and monitor block devices, pools, file systems

- Must be enabled

```
# systemctl enable --now stratisd
```

- File system managed by Stratis should be configured with Stratis Tools and commands only

Manage Stratis Pool

- Assemble block storage into stratis pool

```
# stratis pool create pool1 /dev/vdb
```

- List all pools

```
# stratis pool list
Name                    Total  Physical
pool1  20 GiB / 37.64 MiB / 19.96 GiB
```

Warning
If pool runs out, further writes is quietly lost

- Add more block storage into the pool

```
# stratis pool add-data pool1 /dev/vdc
```

- List all block storage in the pool

```
# stratis blockdev list pool1
```

Managing Stratis File Systems

- Create Stratis file system

```
# stratis filesystem create pool1 fs1-app
# stratis filesystem create pool1 fs2-app
# stratis filesystem create pool1 fs3-data
```

- Remove Stratis file system

```
# stratis filesystem destroy pool1 fs2-app
```

- List Stratis file system

```
# stratis filesystem list [pool1]
# stratis fs
# blkid
# lsblk --fs --list | grep stratis
```

Mount the file system

- Temporarily

```
# ls /stratis/pool1
# mkdir /app /data
# mount /stratis/pool1/fs1-app /app
# mount /stratis/pool1/fs2-data /data
```

- Permanently
  - Add UUID of each stratis fs into /etc/vfstab

```
# blkid | grep stratis | tail -2 | awk '{print $2}' >> /etc/fstab
```

- Modify /etc/fstab accordingly

Modified /etc/fstab

- x-systemd.requires=stratisd.service option
- Only mount after stratisd.service is started

UUID="2795b12a-2d1b-49b9-a546-221bd620bad0" /app xfs defaults,**x-systemd.requires=stratisd.service** 0 0

/stratis/pool1/fs2-data /data xfs defaults,**x-systemd.requires=stratisd.service** 0 0

- Restart stratisd daemon and mount

```
# systemctl daemon-reload
# mount -a
```

Verify mounted Stratis File Systems

```
# df -h
/dev/mapper/stratis-1-903319036ba84af7b6add7a2c0aa3440-thin-fs-
2795b12a2d1b49b9a546221bd620bad0  1.0T  7.2G 1017G   1% /app
/dev/mapper/stratis-1-903319036ba84af7b6add7a2c0aa3440-thin-fs-
f05cc33f321840a5b749b0cbc3672aeb  1.0T  7.2G 1017G   1% /data
```

- There are THIN-provisioned!
  - df command report 1TB, regardless actual size configured
- Keep monitor pool free space.

Working with Stratis Snapshots

- For backup purpose
- Use Cloning process
- Thin-provisioned
- Create snapshot from fs1-app

```
# stratis fs snapshot pool1 fs1-app 20200101
```

- Verify snapshot creation

```
# stratis fs list pool1
# ls /stratis/pool1/
```

- Keep monitor pool free space.

Restore Snapshots

- Restore individual file

```
# mkdir /app/snapshots
# mount /stratis/pool1/20200101 /app/snapshots
# cp /app/snapshots/<deleted file> /app
```

- Restore entire file system

```
# stratis fs destroy fs1-app
# stratis fs snapshot pool1 20200101 fs1-app
```

- Verify restoration

```
# stratis fs list pool1
# ls /stratis/pool1/
# mount /stratis/pool1/fs1-app /app
```

Unconfigured Stratis

1. vi /etc/fstab
2. Unmount all stratis file systems
3. Remove all file systems (incl. snapshots)
4. Remove all pools
5. Stop stratisd
6. Remove stratis packages

Unconfigured Stratis

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umount –a

stratis fs destroy pool1 <filesystem name>

stratis pool destroy pool1

systemctl stop stratisd

dnf –y remove stratis-cli stratisd

Quiz

1. What are so good about stratis? [Choose all that applies]
   a) It has the capability to thin-provisioning, snapshots
   b) It provides programming API to configure storage
   c) It allows the file system to be mounted using different file system type
   d) It supported long list of block device including local disks

2. If stratisd is not running, what should you do?
   a) Reboot the system
   b) Destroy pool and recreate pool
   c) Restart the service
   d) Restore File System from snapshot

3. When pool runs out of storage, what happens to stratis file system?
   a) Some file system in the pool may not be accessible
   b) All file systems in the pool are not accessible
   c) System will crash and boot into emergency mode
   d) Nothing happens

4. True or False: Stratis does support NVMe, SSD and iSCSI block devices

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