

实验五、bLobFS原理和源码分析

实验目的

- 学习BlobFS基本原理, 创建并挂载BlobFS

实验内容

- 学习BlobFS基本原理
- 在Nvme上创建BlobFS
- 通过Fuse挂载BlobFS

实验过程和步骤

启动虚拟机

```
./start.sh ssd
```

初始化环境

在spdk目录下

```
sudo HUGEMEM=5120 ./scripts/setup.sh
```

安装fuse依赖

```
sudo apt install libfuse3-dev
```

编译

```
./configure --with-fuse  
make -j$(nproc)
```

生成NVMe配置文件

```
./scripts/gen_nvme.sh --json-with-subsystems > ./test/blobfs/nvme.json
```

创建一个空的SPDK blobfs

在 `spdk/test/blobfs/` 目录下

```
sudo ./mkfs/mkfs ./nvme.json Nvme0n1
```

```
miracle@cs-exp-zns:~/work/spdk/test/blobfs$ sudo ./mkfs/mkfs ./nvme.json Nvme0n1
[2022-11-23 10:19:41.355624] Starting SPDK v23.01-pre / DPDK 22.07.0 initialization...
[2022-11-23 10:19:41.355688] [ DPDK EAL parameters: [2022-11-23 10:19:41.355720] spdk mkfs [2022-11-23 10:19:41.355728] --no-shconf [2022-11-23 10:19:41.355736] -c 0x3 [2022-11-23 10:19:41.355743] --huge
-unlink [2022-11-23 10:19:41.355754] --log-level=lib.eal:6 [2022-11-23 10:19:41.355761] --log-level=lib.cryptodev:5 [2022-11-23 10:19:41.355770] --log-level=user1:6 [2022-11-23 10:19:41.355776] --iova-mo
de=pa [2022-11-23 10:19:41.355785] --base-virtaddr=0x200000000000 [2022-11-23 10:19:41.355794] --match-allocations [2022-11-23 10:19:41.355801] --file-prefix=spdk_pid1290 [2022-11-23 10:19:41.355809] ]
TELEMETRY: No legacy callbacks, legacy socket not created
[2022-11-23 10:19:41.478711] app.c: 705:spdk_app_start: *NOTICE*: Total cores available: 2
[2022-11-23 10:19:41.510520] reactor.c: 926:reactor_run: *NOTICE*: Reactor started on core 0
[2022-11-23 10:19:41.510519] reactor.c: 926:reactor_run: *NOTICE*: Reactor started on core 1
[2022-11-23 10:19:41.512402] accel_sw.c: 466:sw_accel_module_init: *NOTICE*: Accel framework software module initialized.
initializing filesystem on bdev Nvme0n1...done.
miracle@cs-exp-zns:~/work/spdk/test/blobfs$
```

创建挂载的目录

```
sudo mkdir /mnt/fuse
```

运行fuse示例程序

在 `spdk/test/blobfs/` 目录下

```
sudo ./fuse/fuse ./nvme.json Nvme0n1 /mnt/fuse/
```

```
miracle@cs-exp-zns:~/work/spdk/test/blobfs$ sudo ./fuse/fuse ./nvme.json Nvme0n1 /mnt/fuse/
[2022-11-23 10:20:50.992665] Starting SPDK v23.01-pre / DPDK 22.07.0 initialization...
[2022-11-23 10:20:50.992759] [ DPDK EAL parameters: [2022-11-23 10:20:50.992771] spdk_fuse [2022-11-23 10:20:50.992781] --no-shconf [2022-11-23 10:20:50.992811] -c 0x3 [2022-11-23 10:20:50.992817] --huge
-unlink [2022-11-23 10:20:50.992823] --log-level=lib.eal:6 [2022-11-23 10:20:50.992838] --log-level=lib.cryptodev:5 [2022-11-23 10:20:50.992845] --log-level=user1:6 [2022-11-23 10:20:50.992858] --iova-mo
de=pa [2022-11-23 10:20:50.992868] --base-virtaddr=0x200000000000 [2022-11-23 10:20:50.992880] --match-allocations [2022-11-23 10:20:50.992889] --file-prefix=spdk_pid1297 [2022-11-23 10:20:50.992897] ]
TELEMETRY: No legacy callbacks, legacy socket not created
[2022-11-23 10:20:51.119449] app.c: 705:spdk_app_start: *NOTICE*: Total cores available: 2
[2022-11-23 10:20:51.169674] reactor.c: 926:reactor_run: *NOTICE*: Reactor started on core 1
[2022-11-23 10:20:51.169676] reactor.c: 926:reactor_run: *NOTICE*: Reactor started on core 0
[2022-11-23 10:20:51.172007] accel_sw.c: 466:sw_accel_module_init: *NOTICE*: Accel framework software module initialized.
Mounting filesystem on bdev Nvme0n1 to path /mnt/fuse/...
done.
[2022-11-23 10:20:51.310379] blobfs_fuse.c: 239:fuse_loop_new_thread: *NOTICE*: Start to loop blobfs on bdev Nvme0n1 mounted at /mnt/fuse/

```

实验结论和心得体会

本次实验通过学习BlobFS基本原理在Nvme上创建了BlobFS并通过Fuse对其进行挂载。