

数据库课程设计小组成员报告

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环境配置

首先进行持久化内存模拟

由于使用的是较为高级的 Linux 内核，可以跳过默认配置

通过以下语句先进入/etc/default/grub

然后在文件里面添加语句 `GRUB_CMDLINE_LINUX="memmap=32G!4G"`

32G 为要模拟的大小，4G 为模拟在内存开始的位置

然后更新/etc/default/grub 使之生效即可

```
chenyangping@chenyangping-virtual-machine: ~  
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)  
chenyangping@chenyangping-virtual-machine:~$ vi /etc/default/grub  
chenyangping@chenyangping-virtual-machine:~$ sudo vi /etc/default/grub  
[sudo] chenyangping 的密码:  
chenyangping@chenyangping-virtual-machine:~$ vi /etc/default/grub  
chenyangping@chenyangping-virtual-machine:~$ sudo update-grub  
Generating grub configuration file ...  
Found linux image: /boot/vmlinuz-4.15.0-29-generic  
Found initrd image: /boot/initrd.img-4.15.0-29-generic  
Found memtest86+ image: /boot/memtest86+.elf  
Found memtest86+ image: /boot/memtest86+.bin  
done  
chenyangping@chenyangping-virtual-machine:~$
```

然后用 `dmesg | grep user` 命令查看硬盘环境

```
chenyangping@chenyangping-virtual-machine:~$ dmesg | grep user  
[ 0.000000] e820: user-defined physical RAM map:  
[ 0.000000] user: [mem 0x0000000000000000-0x00000000000009e7ff] usable  
[ 0.000000] user: [mem 0x00000000000009e800-0x00000000000009ffff] reserved  
[ 0.000000] user: [mem 0x0000000000000dc000-0x0000000000000fffff] reserved  
[ 0.000000] user: [mem 0x00000000000100000-0x000000000000bfecffff] usable  
[ 0.000000] user: [mem 0x00000000bfed0000-0x00000000bfefffff] ACPI data  
[ 0.000000] user: [mem 0x00000000bfeff000-0x00000000bfefffff] ACPI NVS  
[ 0.000000] user: [mem 0x00000000bff00000-0x00000000bfffffff] usable  
[ 0.000000] user: [mem 0x00000000f0000000-0x00000000f7ffffff] reserved  
[ 0.000000] user: [mem 0x00000000fec00000-0x00000000fec0ffff] reserved  
[ 0.000000] user: [mem 0x00000000fee00000-0x00000000fee0ffff] reserved  
[ 0.000000] user: [mem 0x00000000fffe0000-0x00000000ffffffff] reserved  
[ 0.000000] user: [mem 0x0000000100000000-0x000000013fffffff] persistent (type 12)  
[ 0.000000] user: [mem 0x0000000140000000-0x00000008fffffff] persistent (type 12)  
[ 1.283431] x86/mm: Checking user space page tables  
[ 9.040785] ppdev: user-space parallel port driver
```

发现确实从 0x0000 0001 0000 0000 – 0x0000 0008 ffff ffff

即从 4G 开始的 32G 全部变为持久化内存

然后建立 ext4 文件系统就能使用持久化内存了。

```
chenyangping@chenyangping-virtual-machine: ~  
文件(F) 编辑(E) 查看(V) 搜索(S) 终端(T) 帮助(H)  
chenyangping@chenyangping-virtual-machine:~$ sudo mkdir /mnt/pmmdir
```

```

chenyangping@chenyangping-virtual-machine:~$ sudo mkfs.ext4 /dev/pmem0
[sudo] chenyangping 的密码:
mke2fs 1.44.1 (24-Mar-2018)
创建含有 262144 个块（每块 4k）和 65536 个inode的文件系统
文件系统UUID: 29b3a39f-71d9-4122-81bb-15b1e8f5d5cc
超级块的备份存储于下列块:
    32768, 98304, 163840, 229376

正在分配组表: 完成
正在写入inode表: 完成
创建日志 (8192 个块) 完成
写入超级块和文件系统账户统计信息: 已完成

```

```

chenyangping@chenyangping-virtual-machine:~$ sudo mount -o dax /dev/pmem0 /mnt/pmemdir
chenyangping@chenyangping-virtual-machine:~$

```

通过 lsblk

```

chenyangping@chenyangping-virtual-machine:~$ lsblk
NAME        MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
loop0       7:0      0   14.5M  1 loop /snap/gnome-logs/37
loop1       7:1      0    2.3M  1 loop /snap/gnome-calculator/180
loop2       7:2      0    2.5M  1 loop /snap/gnome-calculator/826
loop3       7:3      0     13M  1 loop /snap/gnome-characters/103
loop4       7:4      0  140.9M  1 loop /snap/gnome-3-26-1604/70
loop5       7:5      0     2.2M  1 loop /snap/gnome-system-monitor/148
loop6       7:6      0   86.9M  1 loop /snap/core/4917
loop7       7:7      0   34.7M  1 loop /snap/gtk-common-themes/319
loop8       7:8      0     3.7M  1 loop /snap/gnome-system-monitor/51
loop9       7:9      0    276K  1 loop /snap/gnome-characters/570
loop10      7:10     0    956K  1 loop /snap/gnome-logs/100
loop11      7:11     0   97.8M  1 loop /snap/core/10185
loop12      7:12     0   55.4M  1 loop /snap/core18/1932
loop13      7:13     0  140.7M  1 loop /snap/gnome-3-26-1604/100
loop14      7:14     0    62.1M  1 loop /snap/gtk-common-themes/1506
loop15      7:15     0  217.9M  1 loop /snap/gnome-3-34-1804/60
sda         8:0      0    20G   0 disk
└─sda1      8:1      0    20G   0 part /
sr0        11:0     1    1.8G   0 rom  /media/chenyangping/Ubuntu 18.04.1 LTS amd64
pmem0      259:0    0     1G   0 disk /mnt/pmemdir
pmem1      259:1    0    31G   0 disk

```

自此，NVM 环境已模拟成功

然后在 Ubuntu 中配置 PMDK 环境

```

chenyangping@chenyangping-virtual-machine:~$ sudo apt install git
[sudo] chenyangping 的密码:
正在读取软件包列表... 完成
正在分析软件包的依赖关系树
正在读取状态信息... 完成

```

我们可以通过 git 去下载 pmDK，得依次安装 git,make,gcc, libdaxctl-devel, libndctl-devel,m, pandoc,m4, libfabric 库，总的来说就是 pmDK 运行需要的库，装好后通过 make 和 make install 即可完成 PMDK 环境的配置，由于装的库太多，这里就不一一截图了，

至此，持久化内存环境配置成功。