

• XFS Umount issue

- "HALF Umount" due to  
SUPER BLOCK REFERENCE  
FROM CONTAINERS

- MOUNTED ON BOOT, UMOUNTED LATER

①  $\left[ \begin{array}{l} \text{LUN111} = \text{/LUN111} \\ \text{LUN222} = \text{/LUN222} \end{array} \right]$  TEST VOLUMES

②  $\text{Lo /etc/fstab}$

UBUNTU = 14.04.5  
KERNEL = 4.4.0-77

① 644e711 (252:4)

$\left[ \begin{array}{l} (8:224) \text{ SDO} \\ (8:128) \text{ SDI} \\ (8:96) \text{ SDG} \\ (8:192) \text{ SDM} \end{array} \right]$

DM-4

② 144e711 (252:5)

$\left[ \begin{array}{l} (65:16) \text{ SDR} \\ (8:176) \text{ SDL} \\ (8:160) \text{ SDK} \\ (65:0) \text{ SDQ} \end{array} \right]$

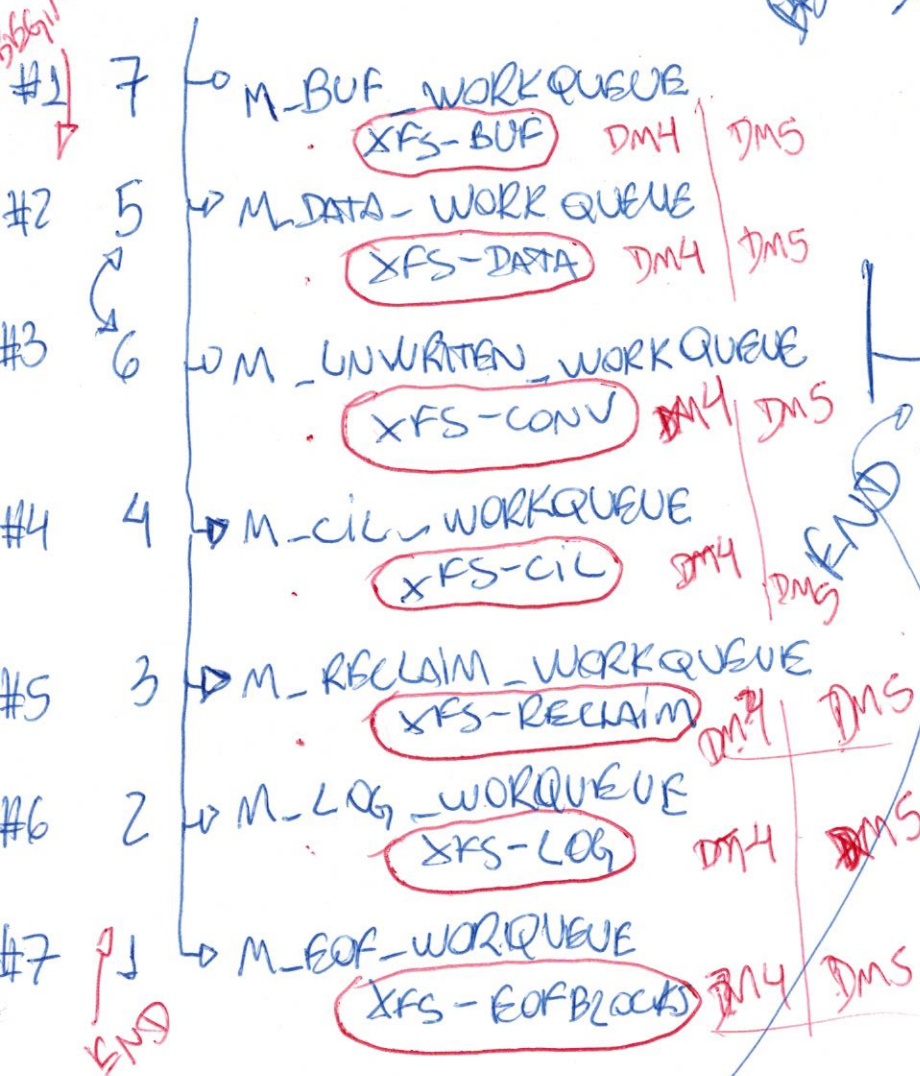
DM-5

=>

begin XFS - MOUNT MP

begin

XFS - FS\_MOUNT :



↳ MOUNT\_BDEV  
↳ XFS\_FS\_FILL\_SUPER

↳ xfs\_init\_mount\_workqueue

XFS\_FS\_PUT\_SUPER :

- FILESTREAM UNMOUNT
- UNMOUNT FS
- FREE SB
- DESTROY\_MOUNT\_WQS

### XFS SUPER OPERATIONS

- ↳ XFS\_FS - {ALLO, DESTROY, EVICT} INODE
- ↳ XFS\_FS - {DROP, PUT, SYNC, FREEZE, UNFREEZE} INODE SUPER FS
- ↳ XFS\_FS - {STATFS, REMOUNT}

SYS\_UMOUNT

↳ sysc\_UMOUNT()

MNTPUT()

MNTPUT\_NO\_EXPIRE()

↳ CLEANUP\_MNT()

↳ DEACTIVATE\_SUPER()

↳ DEACTIVATE\_LOCKED\_SUPER()

SYSCALL UMOUNT

DO\_UMOUNT

↳ NAMESPACE.C

SB ↳ SOP → DUMOUNT-BEGIN(SB)

IF (MNT\_DETACH)

↳ Umount TREE ( ) [UMOUNT\_PROPAGATE

ELSE

↳ Umount TREE ( ) [UMOUNT\_PROPAGATE  
UMOUNT\_SYNC

DN

MNTPUT

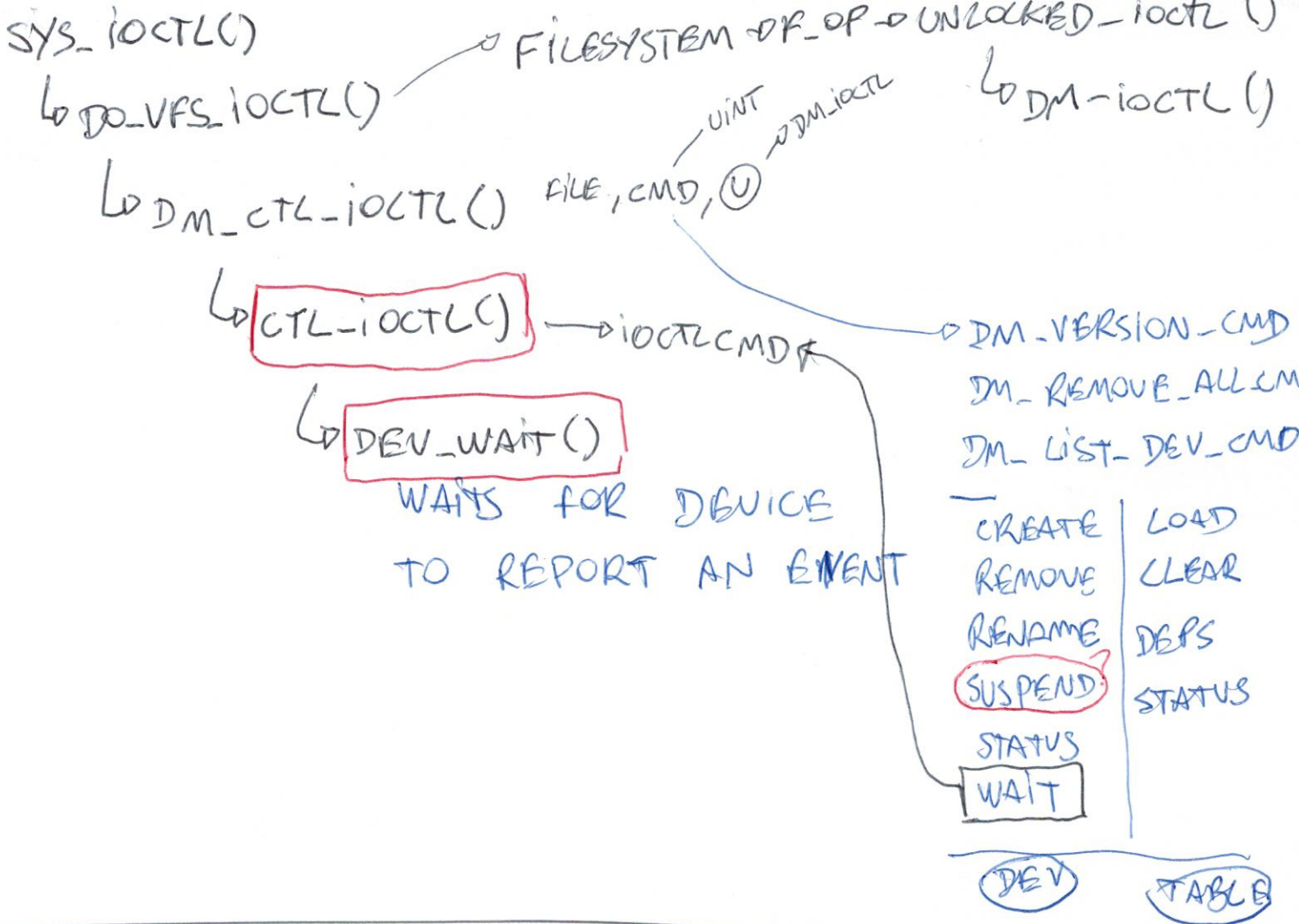
DEFERRED WORK

MNTPUT\_NO\_EXPIRE

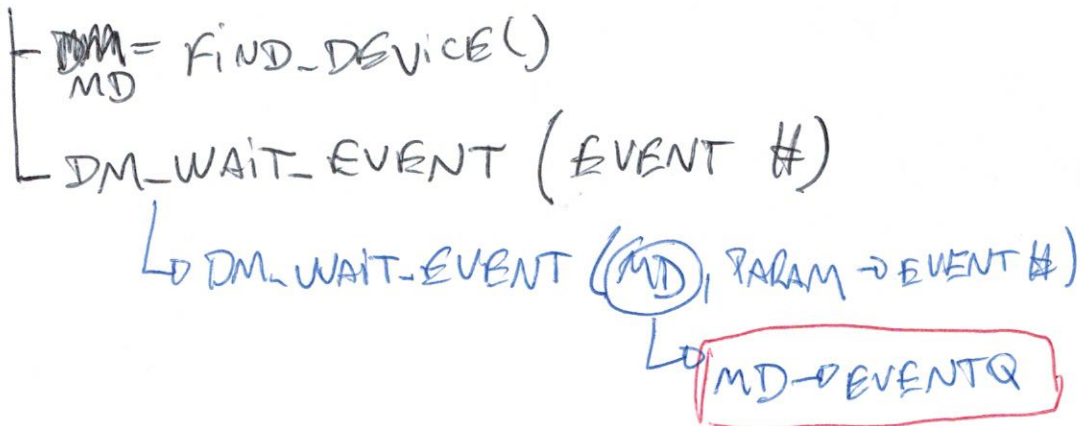
CLEANUP\_MNT

DEACTIVATE  
SUPER





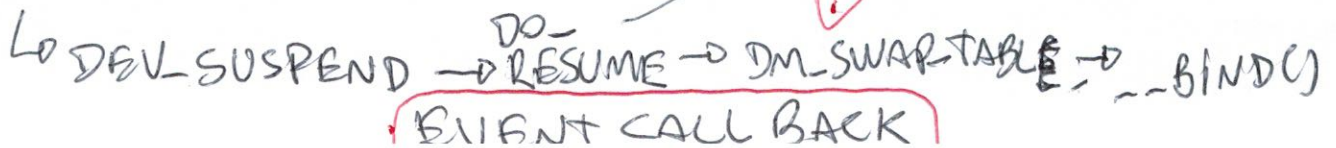
DEV\_WAIT (PARAM)



DM\_CTL\_IOCTL

↳ CTL\_IOCTL

↳ LOOKUP\_IOCTL



XFS\_FS\_PUT\_SUPER() #1

MSG: UNMOUNTING FILESYSTEM

XFS\_FILESTREAM\_UNMOUNT()

XFS\_UNMOUNTFS()

- XFS\_LOG\_FORCE()

- XFS\_AIL\_PUSH\_ALL\_SYNC()

- CANCEL\_DELAYED\_WORK(M\_RECLAIM\_WORK)

- RECLAIM\_INODES()

- XFS\_LOG\_UNMOUNT()

- XFS\_FREE\_PERAG()

- XFS\_SYSFS\_DEL() ★ /sys/fs/disc

BB INODE RECLAIMER

XFS\_DESTROY\_PCPU\_COUNTERS()

XFS\_DESTROY\_MOUNT\_WORKQUEUES()

★ KTHREADS

XFS\_CLOSE\_DEVICES()

└ XFS\_BLKDEV\_PUT()

└ BLKDEV\_PUT()

EOF BLOCKS

M\_LOG

M\_RECLAIM

M\_CIL

M\_DATA

M\_UNWRITTEN

M\_BUF\_WQ

...

SYSCALL UDMOUNT:

IF MNT\_FLAGS [NOT] MNT\_INTERNAL

MNTPUT\_NO\_EXPIRE()

IF NOT KTHREAD

INIT\_TASK\_WORK (MNT → MNT\_RCU, CLEANUP\_MNT)

TASK\_WORK\_ADD (CURRENT, MNT → RCU, TRUE)

↳ TASK → TASKS\_WORK

↳ SET\_NOTIFY\_RESUME (CURRENT)

↳ KICK\_PROCESS()

ENTER  
OR  
EXIT KERNEL

CLEANUP\_MNT (MNT)

RUNS

TASK\_WORK\_RUN()

SCHEDULES  
CLEANUP\_MNT

ON KERNEL → USER

→ KERNEL SWITCH

IF KTHREAD

LLIST\_ADD (MNT → MNTLIST → DELAYED\_MNTPUT\_LIST)

SCHEDULE\_DELAYED\_WORK (DELAYED\_MNTPUT\_WORK)

DELAYED\_MNTPUT()

CLEANUP\_MNT (MNT FROM LIST)



SYSCALL Umount:

MNTPUT\_NO\_EXPIRE()

↳ CLEANUP\_MNT()

if MNT\_FLAGS ~~==~~ MNT\_INTERNAL

↳ DEACTIVATE\_SUPER() ~~SUPER\_BLOCK~~ → OS-UMOUNT LOCK

↳ DEACTIVATE\_LOCKED\_SUPER()

- CLEANCACHE\_INVALIDATE\_FS()

- FS → KILL-SB (SUPERBLOCK)

XFS\_FS\_TYPE.KILL-SB()

= KILL\_BLOCK\_SUPER()

↳ GENERIC\_SHUTDOWN\_SUPER() #1

↳ SYNC\_BLOCKDEV() #2

↳ BLKDEV\_PUT() #3

- PUT\_FILESYSTEM()

- PUT\_SUPER()

↳ MNT\_FREE\_ID()

↳ DELAYED\_FREE\_VFSMNT()

↳ FREE\_VFSMNT()

↳ KMEM-CACHE-FREE()

↳ MNT\_CACHE

SLAB CONTAINS

STRUCT MOUNT FOR FS





- CLONE\_MNT()

- ~~DO\_MOUNT()~~ DO\_LOOPBACK() #1

↳ DO\_MOUNT() BIND MOUNT (-O BIND)

~~DO\_MOUNT()~~ COPY\_TREE() #2

↳ COPY\_MNT\_NS() # ~~3~~ 3

↳ CREATE\_NEW\_NAMESPACES()

↳ COPY\_NAMESPACES()

↳ COPY\_PROCESS()

↳ DO\_FORK()

↳ SYSCALL\_SETNS()

↳ SYSCALL\_UNSHARE()

UNSHARE\_NS\_PROXY\_NAMESPACES

PROPGATE\_ONE() #2.2

↳ PROPAGATE\_MNT()

↳ ATTACH\_RECURSIVE\_MNT()

↳ ... DO\_MOUNT()

#2

RAISING S\_ACTIVE

- FREEZE SUPER()

- IOCTL\_FSFREEZE()  
OR

- FREEZE\_BDEV()

- LOCK\_FS()

- XFS\_FS\_GOINGDOWN()

└ XFS\_FILE\_IOCTL()

└ XFS DIR FILE OPS

└ DM\_SUSPEND()

- DM\_SUSPEND()

└ DO\_RESUME()

└ DO\_SUSPEND()

DEV-SUSPEND()

LOOKUP\_IOCTL

CTL\_IOCTL

DM\_IOCTL\_IOCTL

#1