

→ BLOCK COMMIT

① DESTINATION (BASE) REOPENED RW

②

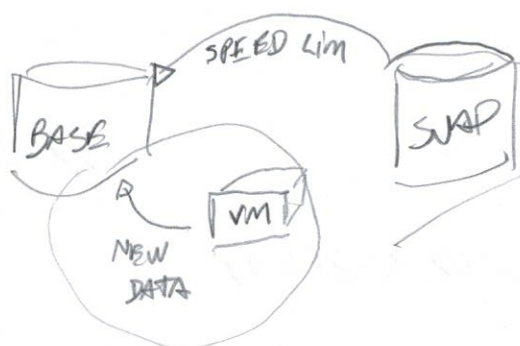


→ NEW SECTORS BEING WRITTEN

→ BDRV-REOPEN()

→ BEING MIGRATED

→ OLD DATA TREATED DIFF FROM NEW DATA



→ BLOCK-MIRROR LIKE CODE "ACTIVE MIRRORING"

- CMD IS GIVEN (BLOCK COMMIT)

↳ FILES ARE LOOKUP

↳ BASE = RW

- DATA (OLD & NEW) ARE COPIED, IMG MANIPULATED WITH BDRV_SWAP()

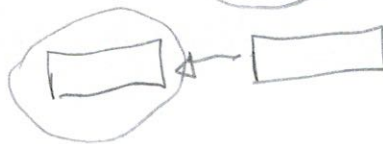
CMD: BLOCK-COMMIT <DBV> <BASE> <TOP> <SPBED>

BLOCK PULL = WORKS



LIVE MERGE

BLOCK COMMIT = BROKEN



BLOCK-MIRROR?

HMP: SNAPSHOT_BLKDEV <DEV> <SNAP> <FMT>

QMP: BLOCKDEV-SNAPSHOT-SYNC <DEV> <SNAP> <FMT>

FOR SNAPSHOT ↗ MERGING ↘

→ COW HEADERS TO SNAPSHOT

PIVOT BLOCK DEVICE TO NEW DEV (ORIGINAL = BACKING DEV)

SNAPSHOT: GUEST IS HALTED

PENDING I/Os FLUSHED TO DISK

PIVOT HAPPENS

GUEST RESUMES

① BLOCK STREAMING (≈ BLOCK PULL)

CMD: BLOCK-STREAM <DEVICE> <BASE> <SPEED>

→ QMP/QAPI COMMAND IN "BLOCKDEV.C"

- AFTER CMD, BLOCK JOB IS STARTED (CO-ROUTINE)

→ MERGES BASE
PARAM "SPEED"

≥ V1.1

② BLOCK COMMIT

- LIMITATION (SNAPS INVALID ON MERGE)

≥ V1.3

#LIVE SNAPSHOTS

MONITOR:

- CONT
- GUEST-FSFREEZE-FREEZE
- SNAPSHOT-BLKDEV <blockx> <snapfile> <format>
- GUEST-FSFREEZE-THAW

HMP:

-SNAPSHOT-BLKDEV <dev> <snap> <format>
 / | \
 vd0 | Qcow2
 |
 /var/lib/libvirt/...

QMP:

-BLOCKDEV-SNAPSHOT-SYNC <dev> <SNAP> [format]

VIRDOMAINPTR

DOM

REPRESENTS THE DOMAIN

VIRCONNECTPTR

CONN

NAME

ID

UUID

↳ REPRESENT
CONNECTION
TO
HYPERVISOR

PATH

BASE

TOP

BANDW

FLAGS

CONN : (AFTER OPEN, NEVER CHANGE)

- FLAGS

- VIRURI PTR

- VIRHYPERVISOR DRIVER PTR DRIVER

- VIRNETWORK DRIVER PTR NETWORK DRIVER

- VIRINTERFACE DRIVER PTR

- VIRSTORAGE DRIVER PTR STORAGE DRIVER

- VIRNODE DEVICE DRIVER PTR

- VIRSECRET DRIVER PTR

- VIRNW FILTER DRIVER PTR

- PRIVATE DATA;

LOCK NEEDED

- VIRERROR

- VIRERROR FUNC

- USER DATA

DEVICE = NULL

TOP PATH = NULL

BASE PATH = NULL

BACKING PATH = NULL

VIR QEMU DRIVER PTR - DRIVER

VIR DOMAIN OBJ PTR - VM

VIR STORAGE SOURCE PTR

TOP SOURCE

BASE SOURCE

TOP PARENT

MIRROR

QEMU DOMAIN OBJ PRIVATE PTR - PRIV

VIR DOMAIN DISK DEF PTR - DISK

VM = QEMU DOM OBJ FROM DOMAIN()

↳ VIRDOMAINOBJLISTFINDBYUIDREF()

DRIVER -> DOMAINS

DOMAIN -> UUID

DOMAIN -> CONN -> PRIVATE
= VIRQEMUDRIVERPTR

↳ VIRDOMAIN OBJ PTR :

- PARENT
- COND
- PID
- STATE
- AUTO START
- PERSISTENT
- UPDATED
- REMOVING

HAS MANAGED SAVE

- PRIVATE DATA = PRIV

- PRIVATE DATA FREE FUNC

- TAINT

- ORIGINAL MEM LOCK

VIRDOMAIN DEF PTR

DEF

NEW DEF

VIRDOMAINSNAPSHOTOBJLIST PTR

↳ SNAPSHOTS

VIRDOMAINSNAPSHOTOBJPTR

↳ CURRENT SNAPSHOT

3
VIR DOMAIN IS ACTIVE (VM)

↳ VIRDOMAINOBJPTR DOM

DOM → DEF → ID ≠ -1

↳ VIRDOMAINDEFPTR

VIR QEMU CAPS GET ()

(QEMU CAPS BLOCK COMMIT
QEMU CAPS BLOCK JOB ASYNC)

↳ GUEST VM MAIN CONFIG
IF NOT
→ ONLINE COMMIT NOT
SUPPORTED

VIR DOMAIN DISK DEFPTR [DISK] = QEMU DOMAIN DISK BYNAME
(VM → DEF , [PATH])

↳ VIR STORAGE SRC PTR SRC
PRIVATE DATA

DEVICE

BUS

DST

TRAY-STATUS

REMOVABLE

SERIAL

WWN

VENDOR

PRODUCT

...

VIR STORAGE SRC PTR MIRROR

MIRROR STATE

MIRROR JOB

VIR DOMAIN DISK BYNAME

VIR DOMAIN DISK INDEX BYNAME ▷

RET DEF → DISKS [INDEX]

VIR DOMAIN DISK DEFPTR

if ^{NO} DISK SRC → PATH = ERROR

VIRDOMAIN DISK DEF PTR

→ VIR STORAGE SOURCE PTR :

- TYPE

- NHOSTS

- READONLY

- PATH

- DRIVERNAME

- SHARED

- PROTOCOL

- VOLUME (VOL NAME)

///

- SNAPSHOT

- CONFIG FILE

VIR STORAGE DRIVER DATA PTR
DRV

VIR STORAGE SOURCE PTR

BACKING STORE

QEMU DOMAIN DISK BLOCK JOB IS ACTIVE()? → ERROR

↳ DISK → MIRROR? - ALREADY ACTIVE BLOCK JOB
DISK PRIV → BLOCK JOB? ✓

X

QEMU DOMAIN DETERMINE DISK CHAIN()

- DRIVER (DOM → CONN → PRIVATE DATA) * VIR QEMU DRIVER PTR
- VM (QEMU DOM OBJ FROM DOMAIN) * VIR DOMAIN OBJ PTR
- DISK (VM → DEF → DISKS [INDEX]) * VIR DOMAIN DISK DEF PTR
- FALSE
- TRUE

main driver config

CFG = DRIVER → CONFIG

DISK → SRC? IF NOT, ERROR

DISK → SRC → BACKING STORE? CLEARS IF "FORCE PROBB"

VIR STORAGE FILE GET METADATA()

DISK → SRC, ...

METADATA

↳ DISK → SRC → BACKING STORE

IF TOP IS NOT PROVIDED ?
- TOP SOURCE = DISK → SRC
STORAGE SRC
→ DOMAIN DISK DEF
→ STORAGE SRC
→ COMING FROM VM-DEF + PATH
DEF → DISKS[INDEX]

ELSE (AND if ...)

STORAGE FILE PARSE CHAIN INDEX (DISK → DST, TOP, TOP INDEX)
CHAR TARGET, CHAR NAME, INDEX

→ PARSE FILE[2]

TOP-SOURCE = VIR STORAGE FILE CHAIN LOOKUP(
DISK → SRC (CHAIN)
NULL (START FROM)
TOP (NAME)
TOP INDEX (INDEX)
TOP PARENT (PARENT)

ACTIVE

IF TOPSOURCE = DISK → SRC → ACTIVE

→ CHECK QEMU CAPS ACTIVE COMMIT
→ CHECK ! VIR DOMAIN BLOCK COMMIT ACTIVE

ELSE IF

VIR DOMAIN BLOCK COMMIT ACTIVE

→ ACTIVE REQUESTED BUT NOT ACTIVE

...

IF NO TOPSOURCE → BACKING STORE → ERROR

ERROR



VIR HYPERVISOR DRIVER

QEMU HYPERVISOR DRIVER

- NAME = QEMU_DRIVER_NAME
- CONNECT OPEN
- CONNECT CLOSE
- ...
- DOMAIN CREATE XML
- DOMAIN LOOKUP BY ID
- DOMAIN SUSPEND
- DOMAIN RESUME
- ...

• DOMAIN BLOCK JOB ABORT

• DOMAIN BLOCK JOB SET SPEED

• DOMAIN BLOCK PULL

• DOMAIN BLOCK REBASE

• DOMAIN BLOCK COPY

• DOMAIN BLOCK COMMIT

qemu Domain Block Commit

(DOM, DEK, BASE, TOP, BW, FLAGS)

VIR DOMAIN BLOCK COMMIT → DRIVER → DOMAIN BLOCK COMMIT()

CMD BLOCK COMMIT() → VSH COMMAND RUN()

VSH CMD DEF [DOMAIN MANAGEMENT CMD SET]

- NAME = "BLOCK COMMIT"
- HANDLER = CMD BLOCK COMMIT
- OPTS = OPTS_BLOCK_COMMIT
- INFO = INFO_BLOCK_COMMIT
- FLAGS = ∅

HELP DESC

VSH CMD OPT DEF

- VERBOSE → BASE
- TIMEOUT → TOP
- PIVOT
- ASYNC

CMD BLOCK COMMIT () → VIRSH-DOMAIN.C

{ SHALLOW
DELETE
ACTIVE
RELATIVE

VIR-DOMAIN-BLOCK-JOB-ABORT-AS
u
JOB-ABORT-PIVOT
ASYNC X PIVOT

DOM = VIRSHCMDOPT(DOM) #11

BLOCKING? → VIRSHBLOCKJOBWAITINIT()

VIRDOMAINBLOCKCOMMIT ~~****~~ () → LIBVIRT-DOMAIN.C

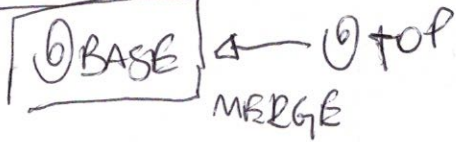
↳ CONN = DOM → CONN

CONN → DRIVER → DOMAINBLOCKCOMMIT()
QEMU ||

QEMU DOMAIN BLOCK COMMIT()

↳ QEMU-DRIVER

VIRDOMAIN BLOCK COMMIT



- STARTS COMMIT BLOCKJOB
- TRACK JOB WITH VIRDOMAIN BLOCKJOBINFO
 - ↳ JOB TYPE: VIR_DOMAIN_BLOCK_JOB_TYPE_COMMIT
- ASYNC EVENT RAISED WHEN FINISHES

WHEN @TOP IS ACTIVE

- ~~IMMEDIATE~~ FLAGS: VIR_DOMAIN_BLOCK_COMMIT_ACTIVE
- JOBTYPE: VIR_DOMAIN_BLOCK_JOB_TYPE_ACTIVE_COMMIT

2 PHASES:

1) CONTENTS BEING COMMITTED TO @BASE

2) CUR == END

JOB REMAINS ALIVE

ALL CHANGES SYNCED BTW @BASE & @TOP

EVENT: VIR_DOMAIN_BLOCK_JOB_READY

CANCEL

@TOP: ACTIVE

@BASE: SYNCED

PIVOT

@TOP: INVALID

@BASE: ACTIVE

FLAGS

- VIR_DOMAIN_BLOCK_COMMIT_DELETE

↳ REMOVE INVALID FILES.

- VIR_DOMAIN_BLOCK_COMMIT_RELATIVE

↳ RELATIVE PATH FOR NEW BACKING FILES.

IF @BASE == NULL

↳ @BASE = BOTTOM OF BACKING CHAIN

IF @FLAGS == SHALLOW

↳ @BASE = IMMEDIATE BACK FILE

IF @TOP == NULL

@TOP = ACTIVE IMAGE