

Arch Linux Exploration

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Rootless Docker setup

Set up `rootless` Docker on Linux (so each user can have their own instance of the Docker daemon running, which provides better container isolation): <https://docs.docker.com/engine/security/rootless/>

This utilizes Docker contexts, which basically allows for switching the active docker daemon using `docker context`: <https://docs.docker.com/engine/context/working-with-contexts/>

Make sure to follow <https://docs.docker.com/engine/security/rootless/#limiting-resources> in order to set up proper Linux cgroup (control group: <https://docs.docker.com/config/containers/runmetrics/>) resource limiting and `docker stats` tracking!

Zram and Zswap

Looking for all `zram` related files - results of `find / -iregex .*zram.* 2>/dev/null`

(`zram` is basically a zlib compressed, in-RAM storage space that can be used for swap or extra storage space. Look up `zram` on the Arch wiki for more information)

```
/home/rohan/.local/share/docker/overlay2/44f1a6f044052f6b992504d9067770cc74
daaae1555de49041fec1e01e763793/diff/usr/sbin/zramctl
/home/rohan/.local/share/docker/overlay2/44f1a6f044052f6b992504d9067770cc74
daaae1555de49041fec1e01e763793/diff/usr/share/bash-
completion/completions/zramctl
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/ubuntu12_64
/steam-runtime-sniper/sniper_platform_0.20240307.80401/files/sbin/zramctl
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/ubuntu12_64
/steam-runtime-sniper/sniper_platform_0.20240307.80401/files/share/bash-
completion/completions/zramctl
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/ubuntu12_64
/steam-runtime-sniper/var/tmp-B436L2/usr/sbin/zramctl
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/ubuntu12_64
/steam-runtime-sniper/var/tmp-B436L2/usr/share/bash-
completion/completions/zramctl
```

```
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/steamapps/c
ommon/SteamLinuxRuntime_sniper/sniper_platform_0.20240307.80401/files/sbin/
zramctl
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/steamapps/c
ommon/SteamLinuxRuntime_sniper/sniper_platform_0.20240307.80401/files/share
/bash-completion/completions/zramctl
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/steamapps/c
ommon/SteamLinuxRuntime_sniper/var/tmp-0GA8L2/usr/sbin/zramctl
/home/rohan/.var/app/com.valvesoftware.Steam/.local/share/Steam/steamapps/c
ommon/SteamLinuxRuntime_sniper/var/tmp-0GA8L2/usr/share/bash-
completion/completions/zramctl
/home/rohan/zram_file_search
/var/cache/pacman/pkg/zram-generator-1.1.2-1-x86_64.pkg.tar.zst
/var/cache/pacman/pkg/zram-generator-1.1.2-1-x86_64.pkg.tar.zst.sig
/var/lib/pacman/local/zram-generator-1.1.2-1
/var/lib/pacman/local/zram-generator-1.1.2-1/mtree
/var/lib/pacman/local/zram-generator-1.1.2-1/desc
/var/lib/pacman/local/zram-generator-1.1.2-1/files
/var/lib/flatpak/runtime/org.freedesktop.Platform/x86_64/23.08/8d036b0bd06a
e893ffab1149b2fa036b8d0a6c3947906de00e6859f681bd16b0/files/bin/zramctl
/var/lib/flatpak/runtime/org.freedesktop.Platform/x86_64/23.08/8d036b0bd06a
e893ffab1149b2fa036b8d0a6c3947906de00e6859f681bd16b0/files/share/bash-
completion/completions/zramctl
/var/lib/flatpak/runtime/org.gnome.Platform/x86_64/46/b6d2adc1f5a0a7ee49001
20df526a4496449e9a798062b23cbedd28372d6d094/files/bin/zramctl
/var/lib/flatpak/runtime/org.gnome.Platform/x86_64/46/b6d2adc1f5a0a7ee49001
20df526a4496449e9a798062b23cbedd28372d6d094/files/share/bash-
completion/completions/zramctl
/var/lib/flatpak/runtime/org.gnome.Platform/x86_64/44/03d58bd67a3f2f54f02fb
04cf46543e820d1b4b4c0ceb44271edd4224d3bad2a/files/bin/zramctl
/var/lib/flatpak/runtime/org.gnome.Platform/x86_64/44/03d58bd67a3f2f54f02fb
04cf46543e820d1b4b4c0ceb44271edd4224d3bad2a/files/share/bash-
completion/completions/zramctl
/var/lib/flatpak/runtime/org.gnome.Platform/x86_64/45/e66d066758b2a7b50a1ca
c032041fc1569c428f7cfff988dcba554b3c035a191d/files/bin/zramctl
/var/lib/flatpak/runtime/org.gnome.Platform/x86_64/45/e66d066758b2a7b50a1ca
c032041fc1569c428f7cfff988dcba554b3c035a191d/files/share/bash-
completion/completions/zramctl
/var/lib/flatpak/runtime/org.kde.Platform/x86_64/6.6/d9a07ad16df6b5858f9240
14ae6bc0803035276bd317da79e4a36bae2f68790b/files/bin/zramctl
/var/lib/flatpak/runtime/org.kde.Platform/x86_64/6.6/d9a07ad16df6b5858f9240
14ae6bc0803035276bd317da79e4a36bae2f68790b/files/share/bash-
completion/completions/zramctl
/var/lib/flatpak/runtime/org.freedesktop.Sdk/x86_64/22.08/5e230002750b20fbb
628d1154b95aba1a4ede0c08f36e71cbca19ae6452be500/files/bin/zramctl
/var/lib/flatpak/runtime/org.freedesktop.Sdk/x86_64/22.08/5e230002750b20fbb
628d1154b95aba1a4ede0c08f36e71cbca19ae6452be500/files/share/bash-
completion/completions/zramctl
/var/lib/flatpak/.removed/org.freedesktop.Platform-
a27ac639f80307e4b70c135012b7e2f1e74b17a4bb11b1ae7e15aae7d24f1879/files/bin/
zramctl
/var/lib/flatpak/.removed/org.freedesktop.Platform-
a27ac639f80307e4b70c135012b7e2f1e74b17a4bb11b1ae7e15aae7d24f1879/files/shar
e/bash-completion/completions/zramctl
```

```
/dev/zram0
/run/udev/data/+module:zram
/run/systemd/units/invocation:systemd-zram-setup@zram0.service
/run/systemd/units/invocation:dev-zram0.swap
/run/systemd/generator/systemd-zram-setup@zram0.service.d
/run/systemd/generator/systemd-zram-setup@zram0.service.d/bindings.conf
/run/systemd/generator/dev-zram0.swap
/run/systemd/generator/swap.target.wants/dev-zram0.swap
/etc/systemd/zram-generator.conf
/sys/kernel/btf/zram
/sys/kernel/debug/zram
/sys/kernel/debug/zram/zram0
/sys/kernel/debug/zram/zram0/block_state
/sys/kernel/debug/shrinker/mm-zspool:zram0-43
/sys/kernel/debug/shrinker/mm-zspool:zram0-43/scan
/sys/kernel/debug/shrinker/mm-zspool:zram0-43/count
/sys/kernel/debug/zsmalloc/zram0
/sys/kernel/debug/zsmalloc/zram0/classes
/sys/kernel/debug/block/zram0
/sys/kernel/debug/printk/index/zram
/sys/class/block/zram0
/sys/class/zram-control
/sys/class/zram-control/hot_remove
/sys/class/zram-control/hot_add
/sys/devices/virtual/block/zram0
/sys/devices/virtual/block/zram0/uevent
/sys/devices/virtual/block/zram0/ext_range
/sys/devices/virtual/block/zram0/mm_stat
/sys/devices/virtual/block/zram0/range
/sys/devices/virtual/block/zram0/recompress
/sys/devices/virtual/block/zram0/backing_dev
/sys/devices/virtual/block/zram0/alignment_offset
/sys/devices/virtual/block/zram0/diskseq
/sys/devices/virtual/block/zram0/writeback_limit_enable
/sys/devices/virtual/block/zram0/power
/sys/devices/virtual/block/zram0/power/runtime_active_time
/sys/devices/virtual/block/zram0/power/runtime_status
/sys/devices/virtual/block/zram0/power/autosuspend_delay_ms
/sys/devices/virtual/block/zram0/power/runtime_suspended_time
/sys/devices/virtual/block/zram0/power/control
/sys/devices/virtual/block/zram0/reset
/sys/devices/virtual/block/zram0/mem_limit
/sys/devices/virtual/block/zram0/comp_algorithm
/sys/devices/virtual/block/zram0/dev
/sys/devices/virtual/block/zram0/holders
/sys/devices/virtual/block/zram0/bd_stat
/sys/devices/virtual/block/zram0/ro
/sys/devices/virtual/block/zram0/mem_used_max
/sys/devices/virtual/block/zram0/stat
/sys/devices/virtual/block/zram0/events_poll_msecs
/sys/devices/virtual/block/zram0/writeback
/sys/devices/virtual/block/zram0/writeback_limit
/sys/devices/virtual/block/zram0/events_async
/sys/devices/virtual/block/zram0/compact
```

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/sys/devices/virtual/block/zram0/queue
/sys/devices/virtual/block/zram0/queue/io_poll_delay
/sys/devices/virtual/block/zram0/queue/max_integrity_segments
/sys/devices/virtual/block/zram0/queue/zoned
/sys/devices/virtual/block/zram0/queue/throttle_sample_time
/sys/devices/virtual/block/zram0/queue/io_poll
/sys/devices/virtual/block/zram0/queue/discard_zeroes_data
/sys/devices/virtual/block/zram0/queue/minimum_io_size
/sys/devices/virtual/block/zram0/queue/nr_zones
/sys/devices/virtual/block/zram0/queue/write_same_max_bytes
/sys/devices/virtual/block/zram0/queue/max_segments
/sys/devices/virtual/block/zram0/queue/dax
/sys/devices/virtual/block/zram0/queue/dma_alignment
/sys/devices/virtual/block/zram0/queue/physical_block_size
/sys/devices/virtual/block/zram0/queue/logical_block_size
/sys/devices/virtual/block/zram0/queue/virt_boundary_mask
/sys/devices/virtual/block/zram0/queue/zone_append_max_bytes
/sys/devices/virtual/block/zram0/queue/write_cache
/sys/devices/virtual/block/zram0/queue/stable_writes
/sys/devices/virtual/block/zram0/queue/max_segment_size
/sys/devices/virtual/block/zram0/queue/rotational
/sys/devices/virtual/block/zram0/queue/discard_max_bytes
/sys/devices/virtual/block/zram0/queue/add_random
/sys/devices/virtual/block/zram0/queue/discard_max_hw_bytes
/sys/devices/virtual/block/zram0/queue/optimal_io_size
/sys/devices/virtual/block/zram0/queue/chunk_sectors
/sys/devices/virtual/block/zram0/queue/read_ahead_kb
/sys/devices/virtual/block/zram0/queue/max_discard_segments
/sys/devices/virtual/block/zram0/queue/write_zeroes_max_bytes
/sys/devices/virtual/block/zram0/queue/nomerges
/sys/devices/virtual/block/zram0/queue/zone_write_granularity
/sys/devices/virtual/block/zram0/queue/fua
/sys/devices/virtual/block/zram0/queue/discard_granularity
/sys/devices/virtual/block/zram0/queue/max_sectors_kb
/sys/devices/virtual/block/zram0/queue/hw_sector_size
/sys/devices/virtual/block/zram0/queue/max_hw_sectors_kb
/sys/devices/virtual/block/zram0/queue/iostats
/sys/devices/virtual/block/zram0/size
/sys/devices/virtual/block/zram0/disksize
/sys/devices/virtual/block/zram0/integrity
/sys/devices/virtual/block/zram0/integrity/write_generate
/sys/devices/virtual/block/zram0/integrity/format
/sys/devices/virtual/block/zram0/integrity/read_verify
/sys/devices/virtual/block/zram0/integrity/tag_size
/sys/devices/virtual/block/zram0/integrity/protection_interval_bytes
/sys/devices/virtual/block/zram0/integrity/device_is_integrity_capable
/sys/devices/virtual/block/zram0/discard_alignment
/sys/devices/virtual/block/zram0/subsystem
/sys/devices/virtual/block/zram0/trace
/sys/devices/virtual/block/zram0/trace/end_lba
/sys/devices/virtual/block/zram0/trace/act_mask
/sys/devices/virtual/block/zram0/trace/start_lba
/sys/devices/virtual/block/zram0/trace/enable
/sys/devices/virtual/block/zram0/trace/pid
```

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/sys/devices/virtual/block/zram0/io_stat
/sys/devices/virtual/block/zram0/max_comp_streams
/sys/devices/virtual/block/zram0/recomp_algorithm
/sys/devices/virtual/block/zram0/capability
/sys/devices/virtual/block/zram0/bdi
/sys/devices/virtual/block/zram0/hidden
/sys/devices/virtual/block/zram0/debug_stat
/sys/devices/virtual/block/zram0/removable
/sys/devices/virtual/block/zram0/idle
/sys/devices/virtual/block/zram0/initstate
/sys/devices/virtual/block/zram0/events
/sys/devices/virtual/block/zram0/inflight
/sys/devices/virtual/block/zram0/slaves
/sys/fs/cgroup/system.slice/dev-zram0.swap
/sys/fs/cgroup/system.slice/dev-zram0.swap/misc.events
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.events
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.events
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.latency
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.prio.class
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.pressure
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpuset.cpus.exclusive.effective
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.procs
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.events.local
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.swap.peak
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.swap.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/misc.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpuset.cpus.exclusive
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.swap.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.zswap.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.weight
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.swap.events
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.max.descendants
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.stat
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.weight.nice
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.pressure
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/pids.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.stat
/sys/fs/cgroup/system.slice/dev-zram0.swap/pids.events
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.low
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.pressure
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.type
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.bfq.weight
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.stat
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.1GB.events.local
/sys/fs/cgroup/system.slice/dev-zram0.swap/rdma.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.swap.high
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.low
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.2MB.rsvd.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.idle
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.stat.local
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.1GB.rsvd.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/rdma.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.2MB.events
```



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/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.threads
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.numa_stat
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.kill
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.1GB.rsvd.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.peak
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.2MB.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpuset.cpus.partition
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpuset.cpus.effective
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.1GB.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.freeze
/sys/fs/cgroup/system.slice/dev-zram0.swap/irq.pressure
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.2MB.numa_stat
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.min
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.max.burst
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.controllers
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.1GB.numa_stat
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.2MB.events.local
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.oom.group
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.zswap.writeback
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.uclamp.min
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpuset.mems
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.high
/sys/fs/cgroup/system.slice/dev-zram0.swap/pids.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.zswap.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/misc.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpuset.mems.effective
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.subtree_control
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.1GB.events
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.1GB.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.2MB.rsvd.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.weight
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpuset.cpus
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.reclaim
/sys/fs/cgroup/system.slice/dev-zram0.swap/pids.peak
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.max.depth
/sys/fs/cgroup/system.slice/dev-zram0.swap/cgroup.pressure
/sys/fs/cgroup/system.slice/dev-zram0.swap/io.stat
/sys/fs/cgroup/system.slice/dev-zram0.swap/cpu.uclamp.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/hugetlb.2MB.max
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/misc.events
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.events
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.events
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/io.latency
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/io.prio.class
/sys/fs/cgroup/system.slice/system-
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systemd\x2dzram\x2dsetup.slice/io.pressure
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpuset.cpus.exclusive.effective
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.procs
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.events.local
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.swap.peak
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.swap.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/misc.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpuset.cpus.exclusive
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.swap.max
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpu.weight
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.swap.events
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.max.descendants
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpu.stat
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpu.weight.nice
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.pressure
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/pids.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.stat
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/pids.events
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.low
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpu.pressure
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.type
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/io.bfq.weight
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.stat
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.1GB.events.local
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/rdma.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.swap.high
```

```
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/io.low
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.2MB.rsvd.max
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/cpu.idle
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpu.stat.local
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.1GB.rsvd.current
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/rdma.max
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.2MB.events
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.threads
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.numa_stat
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.kill
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.1GB.rsvd.max
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.peak
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.2MB.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpuset.cpus.partition
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpuset.cpus.effective
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.1GB.max
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.freeze
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/irq.pressure
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.2MB.numa_stat
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.min
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpu.max.burst
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cgroup.controllers
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/cpu.max
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.1GB.numa_stat
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/hugetlb.2MB.events.local
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.oom.group
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.max
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/cpu.uclamp.min
```



```
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/cpuset.mems  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/memory.high  
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/pids.max  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/memory.zswap.max  
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/misc.max  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/cpuset.mems.effective  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/cgroup.subtree_control  
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/io.max  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/hugetlb.1GB.events  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/hugetlb.1GB.current  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/hugetlb.2MB.rsvd.current  
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/io.weight  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/cpuset.cpus  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/memory.reclaim  
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/pids.peak  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/cgroup.max.depth  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/cgroup.pressure  
/sys/fs/cgroup/system.slice/system-systemd\x2dzram\x2dsetup.slice/io.stat  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/cpu.ucldamp.max  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dzram\x2dsetup.slice/hugetlb.2MB.max  
/sys/block/zram0  
/sys/module/zram  
/sys/module/zram/initsize  
/sys/module/zram/uevent  
/sys/module/zram/notes  
/sys/module/zram/notes/.note.Linux  
/sys/module/zram/notes/.note.gnu.build-id  
/sys/module/zram/notes/.note.gnu.property  
/sys/module/zram/taint  
/sys/module/zram/srcversion  
/sys/module/zram/holders  
/sys/module/zram/refcnt  
/sys/module/zram/coresize  
/sys/module/zram/initstate  
/sys/module/zram/sections  
/sys/module/zram/sections/__patchable_function_entries  
/sys/module/zram/sections/.orc_unwind  
/sys/module/zram/sections/__param  
/sys/module/zram/sections/.ibt_endbr_seal  
/sys/module/zram/sections/.printk_index
```

```

/sys/module/zram/sections/.note.Linux
/sys/module/zram/sections/.static_call_sites
/sys/module/zram/sections/.strtab
/sys/module/zram/sections/__mcount_loc
/sys/module/zram/sections/.exit.text
/sys/module/zram/sections/.exit.data
/sys/module/zram/sections/.bss
/sys/module/zram/sections/.orc_unwind_ip
/sys/module/zram/sections/.return_sites
/sys/module/zram/sections/.gnu.linkonce.this_module
/sys/module/zram/sections/.symtab
/sys/module/zram/sections/.rodata
/sys/module/zram/sections/.init.text
/sys/module/zram/sections/.note.gnu.build-id
/sys/module/zram/sections/.text
/sys/module/zram/sections/.init.data
/sys/module/zram/sections/.call_sites
/sys/module/zram/sections/.data
/sys/module/zram/sections/.smp_locks
/sys/module/zram/sections/__bug_table
/sys/module/zram/sections/.rodata.str1.1
/sys/module/zram/sections/.note.gnu.property
/sys/module/zram/sections/.orc_header
/sys/module/zram/sections/.rodata.str1.8
/usr/share/licenses/zram-generator
/usr/share/licenses/zram-generator/LICENSE
/usr/share/man/man5/zram-generator.conf.5.gz
/usr/share/man/man8/zramctl.8.gz
/usr/share/man/man8/zram-generator.8.gz
/usr/share/doc/zram-generator
/usr/share/doc/zram-generator/zram-generator.conf.example
/usr/share/bash-completion/completions/zramctl
/usr/bin/zramctl
/usr/lib/systemd/system/systemd-zram-setup@.service
/usr/lib/systemd/system-generators/zram-generator
/usr/lib/modules/6.8.4-arch1-1/kernel/drivers/block/zram
/usr/lib/modules/6.8.4-arch1-1/kernel/drivers/block/zram/zram.ko.zst
/usr/lib/modules/6.8.4-arch1-1/build/drivers/block/zram
/usr/lib/modules/6.8.4-arch1-1/build/drivers/block/zram/Kconfig

```

Also looking for **zswap** files (look it up on the Arch wiki...) in a similar way to configure that:

```

/sys/fs/cgroup/sys-fs-fuse-connections.mount/memory.zswap.current
/sys/fs/cgroup/sys-fs-fuse-connections.mount/memory.zswap.writeback
/sys/fs/cgroup/sys-fs-fuse-connections.mount/memory.zswap.max
/sys/fs/cgroup/sys-kernel-config.mount/memory.zswap.current
/sys/fs/cgroup/sys-kernel-config.mount/memory.zswap.writeback
/sys/fs/cgroup/sys-kernel-config.mount/memory.zswap.max
/sys/fs/cgroup/sys-kernel-debug.mount/memory.zswap.current
/sys/fs/cgroup/sys-kernel-debug.mount/memory.zswap.writeback
/sys/fs/cgroup/sys-kernel-debug.mount/memory.zswap.max
/sys/fs/cgroup/dev-mqueue.mount/memory.zswap.current

```

```
/sys/fs/cgroup/dev-mqueue.mount/memory.zswap.writeback
/sys/fs/cgroup/dev-mqueue.mount/memory.zswap.max
/sys/fs/cgroup/user.slice/memory.zswap.current
/sys/fs/cgroup/user.slice/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-permission-
store.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-permission-
store.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-permission-
store.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/dbus-
broker.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/dbus-
broker.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/dbus-
broker.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-document-
portal.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-document-
portal.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-document-
portal.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-desktop-
portal.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-desktop-
portal.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/xdg-desktop-
portal.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/plasma-
kmsserver.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/plasma-
kmsserver.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/plasma-
kmsserver.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/pipewire-
pulse.service/memory.zswap.current
```

```
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/pipewire-  
pulse.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/pipewire-  
pulse.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-  
kwin_wayland.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-  
kwin_wayland.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-  
kwin_wayland.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/wireplumber.service/memory.zswap  
.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/wireplumber.service/memory.zswap  
.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/wireplumber.service/memory.zswap  
.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-  
kded6.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-  
kded6.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-  
kded6.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-xdg-desktop-portal-  
kde.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-xdg-desktop-portal-  
kde.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/plasma-xdg-desktop-portal-  
kde.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/at-spi-dbus-  
bus.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/at-spi-dbus-  
bus.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/session.slice/at-spi-dbus-  
bus.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-
```

```
1000.slice/user@1000.service/session.slice/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/pipewire.service/memory.zswap.cu
rrent
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/pipewire.service/memory.zswap.wr
iteback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/session.slice/pipewire.service/memory.zswap.ma
x
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
kactivitymanagerd.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
kactivitymanagerd.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
kactivitymanagerd.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-polkit-
agent.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-polkit-
agent.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-polkit-
agent.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
xembedsniproxy.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
xembedsniproxy.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
xembedsniproxy.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
ksystemstats.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
ksystemstats.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
ksystemstats.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/background.slice/plasma-
baloorunner.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
```



```
1000.slice/user@1000.service/background.slice/plasma-  
baloorunner.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
baloorunner.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
gmenudbusmenuproxy.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
gmenudbusmenuproxy.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
gmenudbusmenuproxy.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
krunner.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
krunner.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
krunner.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
powerdevil.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
powerdevil.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/plasma-  
powerdevil.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/kde-  
baloo.service/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/kde-  
baloo.service/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/background.slice/kde-  
baloo.service/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/user.slice/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/user.slice/docker-  
0d87b50f14a904e7129eba1dd65ec83488d4e74b9349fc01dbdf808c7f532f03.scope/memo  
ry.zswap.current  
/sys/fs/cgroup/user.slice/user-  
1000.slice/user@1000.service/user.slice/docker-  
0d87b50f14a904e7129eba1dd65ec83488d4e74b9349fc01dbdf808c7f532f03.scope/memo
```

```
ry.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/user.slice/docker-
0d87b50f14a904e7129eba1dd65ec83488d4e74b9349fc01dbdf808c7f532f03.scope/memo
ry.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/user.slice/docker-
fad9e7fda659446a395e26afe8c3fa62600c75760588f7c4f4662fc5ec53a766.scope/memo
ry.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/user.slice/docker-
fad9e7fda659446a395e26afe8c3fa62600c75760588f7c4f4662fc5ec53a766.scope/memo
ry.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/user.slice/docker-
fad9e7fda659446a395e26afe8c3fa62600c75760588f7c4f4662fc5ec53a766.scope/memo
ry.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/user.slice/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/user.slice/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
flatpak-com.valvesoftware.Steam-3250211.scope/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
flatpak-com.valvesoftware.Steam-3250211.scope/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
flatpak-com.valvesoftware.Steam-3250211.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
org.kde.plasma\x2dsystemmonitor-
ee71bda014c045d0a906997e9c95e989.scope/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
org.kde.plasma\x2dsystemmonitor-
ee71bda014c045d0a906997e9c95e989.scope/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
org.kde.plasma\x2dsystemmonitor-
ee71bda014c045d0a906997e9c95e989.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
dbus\x2d:1.4\x2dorg.gnome.Geary.slice/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
dbus\x2d:1.4\x2dorg.gnome.Geary.slice/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
dbus\x2d:1.4\x2dorg.gnome.Geary.slice/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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k
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
```

```
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org.a11y.atspi.Registry@0.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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org.a11y.atspi.Registry@0.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/app.slice/docker.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/app.slice/docker.service/memory.zswap.writebac
k
```

```
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-flatpak-dev.vencord.Vesktop-37773.scope/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-flatpak-dev.vencord.Vesktop-37773.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-kaccess@autostart.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-kaccess@autostart.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-kaccess@autostart.service/memory.zswap.max
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-geoclue\x2ddemo\x2dagent@autostart.service/memory.zswap.max
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-firefox-a7376d92ad6348feafbfa257744ea162.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-dbus\x2d:1.4\x2dorg.kde.KSplash.slice/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-dbus\x2d:1.4\x2dorg.kde.KSplash.slice/memory.zswap.writeback
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-org.kde.spectacle.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
```

```
org.kde.dolphin-c23a7ac7f43c430596adeb145ae4fcfb.scope/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
org.kde.dolphin-c23a7ac7f43c430596adeb145ae4fcfb.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
org.kde.kate-6d19521e44de48fd81e0e4dc789ca5be.scope/memory.zswap.current
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
org.kde.kate-6d19521e44de48fd81e0e4dc789ca5be.scope/memory.zswap.max
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/sys/fs/cgroup/user.slice/user-
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org.kde.kate-29ff91028cb74612b320c9077a516ab7.scope/memory.zswap.writeback
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registry.service/memory.zswap.writeback
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registry.service/memory.zswap.max
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helper.service/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
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helper.service/memory.zswap.writeback
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
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```



```
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
dbus\x2d:1.4\x2dorg.freedesktop.Notifications.slice/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
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/sys/fs/cgroup/user.slice/user-  
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portal.service/memory.zswap.writeback  
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portal.service/memory.zswap.max  
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\x2fhome\x2frohan\x2fPostman\x2fPostman-  
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org.kde.dolphin-9cc9d60911194d12994a01908360fd5c.scope/memory.zswap.max  
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
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```

```
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dbus\x2d:1.4\x2dorg.kde.LogoutPrompt.slice/memory.zswap.current  
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/gpg-  
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1000.slice/user@1000.service/app.slice/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
flatpak-com.usebottles.bottles-706096.scope/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
flatpak-com.usebottles.bottles-706096.scope/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
flatpak-com.usebottles.bottles-706096.scope/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
dbus\x2d:1.4\x2dorg.kde.kwalletmanager5.slice/memory.zswap.current  
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dbus\x2d:1.4\x2dorg.kde.kwalletmanager5.slice/memory.zswap.writeback  
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dbus\x2d:1.4\x2dorg.kde.kwalletmanager5.slice/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
org.kde.kmail2-72b8049b9b304253b1cbb3a8badae922.scope/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
org.kde.kmail2-  
72b8049b9b304253b1cbb3a8badae922.scope/memory.zswap.writeback  
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org.kde.kmail2-72b8049b9b304253b1cbb3a8badae922.scope/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-  
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dbus\x2d:1.4\x2dorg.kde.fontinst.slice/memory.zswap.current  
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/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
dbus\x2d:1.4\x2dorg.kde.fontinst.slice/memory.zswap.max  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
flatpak-dev.vencord.Vesktop-37799.scope/memory.zswap.current  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-  
flatpak-dev.vencord.Vesktop-37799.scope/memory.zswap.writeback  
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
```

```
flatpak-dev.vencord.Vesktop-37799.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
flatpak-com.raggessilver.BlackBox-403798.scope/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
flatpak-com.raggessilver.BlackBox-403798.scope/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/user@1000.service/app.slice/app-
flatpak-com.raggessilver.BlackBox-403798.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/init.scope/memory.zswap.current
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/init.scope/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/init.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-
1000.slice/user@1000.service/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/session-
2.scope/memory.zswap.current
/sys/fs/cgroup/user.slice/user-1000.slice/session-
2.scope/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/session-2.scope/memory.zswap.max
/sys/fs/cgroup/user.slice/user-1000.slice/memory.zswap.writeback
/sys/fs/cgroup/user.slice/user-1000.slice/memory.zswap.max
/sys/fs/cgroup/user.slice/memory.zswap.max
/sys/fs/cgroup/sys-kernel-tracing.mount/memory.zswap.current
/sys/fs/cgroup/sys-kernel-tracing.mount/memory.zswap.writeback
/sys/fs/cgroup/sys-kernel-tracing.mount/memory.zswap.max
/sys/fs/cgroup/init.scope/memory.zswap.current
/sys/fs/cgroup/init.scope/memory.zswap.writeback
/sys/fs/cgroup/init.scope/memory.zswap.max
/sys/fs/cgroup/system.slice/var-log.mount/memory.zswap.current
/sys/fs/cgroup/system.slice/var-log.mount/memory.zswap.writeback
/sys/fs/cgroup/system.slice/var-log.mount/memory.zswap.max
/sys/fs/cgroup/system.slice/containerd.service/memory.zswap.current
/sys/fs/cgroup/system.slice/containerd.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/containerd.service/memory.zswap.max
/sys/fs/cgroup/system.slice/systemd-udevd.service/memory.zswap.current
/sys/fs/cgroup/system.slice/systemd-udevd.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/systemd-udevd.service/memory.zswap.max
/sys/fs/cgroup/system.slice/dbus-broker.service/memory.zswap.current
/sys/fs/cgroup/system.slice/dbus-broker.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/dbus-broker.service/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
drkonqi\x2dcoredump\x2dprocessor.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
drkonqi\x2dcoredump\x2dprocessor.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-
drkonqi\x2dcoredump\x2dprocessor.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/system-gpg\x2dagent.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-gpg\x2dagent.slice/memory.zswap.max
```

```
/sys/fs/cgroup/system.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/boot.mount/memory.zswap.current
/sys/fs/cgroup/system.slice/boot.mount/memory.zswap.writeback
/sys/fs/cgroup/system.slice/boot.mount/memory.zswap.max
/sys/fs/cgroup/system.slice/polkit.service/memory.zswap.current
/sys/fs/cgroup/system.slice/polkit.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/polkit.service/memory.zswap.max
/sys/fs/cgroup/system.slice/rtkit-daemon.service/memory.zswap.current
/sys/fs/cgroup/system.slice/rtkit-daemon.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/rtkit-daemon.service/memory.zswap.max
/sys/fs/cgroup/system.slice/\x2esnapshots.mount/memory.zswap.current
/sys/fs/cgroup/system.slice/\x2esnapshots.mount/memory.zswap.writeback
/sys/fs/cgroup/system.slice/\x2esnapshots.mount/memory.zswap.max
/sys/fs/cgroup/system.slice/home.mount/memory.zswap.current
/sys/fs/cgroup/system.slice/home.mount/memory.zswap.writeback
/sys/fs/cgroup/system.slice/home.mount/memory.zswap.max
/sys/fs/cgroup/system.slice/accounts-daemon.service/memory.zswap.current
/sys/fs/cgroup/system.slice/accounts-daemon.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/accounts-daemon.service/memory.zswap.max
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.zswap.current
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.zswap.writeback
/sys/fs/cgroup/system.slice/dev-zram0.swap/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-
systemd\x2dzram\x2dsetup.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/passim.service/memory.zswap.current
/sys/fs/cgroup/system.slice/passim.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/passim.service/memory.zswap.max
/sys/fs/cgroup/system.slice/wpa_supplicant.service/memory.zswap.current
/sys/fs/cgroup/system.slice/wpa_supplicant.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/wpa_supplicant.service/memory.zswap.max
/sys/fs/cgroup/system.slice/system-modprobe.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-modprobe.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-modprobe.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
dbus\x2d1.2\x2dorg.kde.powerdevil.backlighthelper.slice/memory.zswap.curre
nt
/sys/fs/cgroup/system.slice/system-
dbus\x2d1.2\x2dorg.kde.powerdevil.backlighthelper.slice/memory.zswap.write
back
/sys/fs/cgroup/system.slice/system-
dbus\x2d1.2\x2dorg.kde.powerdevil.backlighthelper.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/systemd-journald.service/memory.zswap.current
/sys/fs/cgroup/system.slice/systemd-journald.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/systemd-journald.service/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
dbus\x2d1.2\x2dorg.kde.powerdevil.chargethresholdhelper.slice/memory.zswap
.current
/sys/fs/cgroup/system.slice/system-
dbus\x2d1.2\x2dorg.kde.powerdevil.chargethresholdhelper.slice/memory.zswap
.writeback
```



```
/sys/fs/cgroup/system.slice/system-  
dbus\x2d:1.2\x2dorg.kde.powerdevil.chargethresholdhelper.slice/memory.zswap  
.max  
/sys/fs/cgroup/system.slice/fwupd.service/memory.zswap.current  
/sys/fs/cgroup/system.slice/fwupd.service/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/fwupd.service/memory.zswap.max  
/sys/fs/cgroup/system.slice/NetworkManager.service/memory.zswap.current  
/sys/fs/cgroup/system.slice/NetworkManager.service/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/NetworkManager.service/memory.zswap.max  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dcoredump.slice/memory.zswap.current  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dcoredump.slice/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/system-  
systemd\x2dcoredump.slice/memory.zswap.max  
/sys/fs/cgroup/system.slice/flatpak-system-  
helper.service/memory.zswap.current  
/sys/fs/cgroup/system.slice/flatpak-system-  
helper.service/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/flatpak-system-helper.service/memory.zswap.max  
/sys/fs/cgroup/system.slice/tmp.mount/memory.zswap.current  
/sys/fs/cgroup/system.slice/tmp.mount/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/tmp.mount/memory.zswap.max  
/sys/fs/cgroup/system.slice/systemd-userdbd.service/memory.zswap.current  
/sys/fs/cgroup/system.slice/systemd-userdbd.service/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/systemd-userdbd.service/memory.zswap.max  
/sys/fs/cgroup/system.slice/system-  
dbus\x2d:1.2\x2dorg.kde.powerdevil.discreetepuhelper.slice/memory.zswap.cur  
rent  
/sys/fs/cgroup/system.slice/system-  
dbus\x2d:1.2\x2dorg.kde.powerdevil.discreetepuhelper.slice/memory.zswap.wri  
teback  
/sys/fs/cgroup/system.slice/system-  
dbus\x2d:1.2\x2dorg.kde.powerdevil.discreetepuhelper.slice/memory.zswap.max  
/sys/fs/cgroup/system.slice/system-dirmngr.slice/memory.zswap.current  
/sys/fs/cgroup/system.slice/system-dirmngr.slice/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/system-dirmngr.slice/memory.zswap.max  
/sys/fs/cgroup/system.slice/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/system-  
dbus\x2d:1.2\x2dorg.kde.kded.smart.slice/memory.zswap.current  
/sys/fs/cgroup/system.slice/system-  
dbus\x2d:1.2\x2dorg.kde.kded.smart.slice/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/system-  
dbus\x2d:1.2\x2dorg.kde.kded.smart.slice/memory.zswap.max  
/sys/fs/cgroup/system.slice/upower.service/memory.zswap.current  
/sys/fs/cgroup/system.slice/upower.service/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/upower.service/memory.zswap.max  
/sys/fs/cgroup/system.slice/sddm.service/memory.zswap.current  
/sys/fs/cgroup/system.slice/sddm.service/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/sddm.service/memory.zswap.max  
/sys/fs/cgroup/system.slice/var-cache-pacman-pkg.mount/memory.zswap.current  
/sys/fs/cgroup/system.slice/var-cache-pacman-  
pkg.mount/memory.zswap.writeback  
/sys/fs/cgroup/system.slice/var-cache-pacman-pkg.mount/memory.zswap.max
```



```
/sys/fs/cgroup/system.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
dbus\x2d:1.2\x2dorg.kde.kinfocenter.dmidcode.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
dbus\x2d:1.2\x2dorg.kde.kinfocenter.dmidcode.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-
dbus\x2d:1.2\x2dorg.kde.kinfocenter.dmidcode.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/udisks2.service/memory.zswap.current
/sys/fs/cgroup/system.slice/udisks2.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/udisks2.service/memory.zswap.max
/sys/fs/cgroup/system.slice/systemd-timesyncd.service/memory.zswap.current
/sys/fs/cgroup/system.slice/systemd-
timesyncd.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/systemd-timesyncd.service/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dbrowser.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dbrowser.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dbrowser.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/system-getty.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-getty.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-getty.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dextra.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dextra.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dextra.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/system-keyboxd.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-keyboxd.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-keyboxd.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/avahi-daemon.service/memory.zswap.current
/sys/fs/cgroup/system.slice/avahi-daemon.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/avahi-daemon.service/memory.zswap.max
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dssh.slice/memory.zswap.current
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dssh.slice/memory.zswap.writeback
/sys/fs/cgroup/system.slice/system-
gpg\x2dagent\x2dssh.slice/memory.zswap.max
/sys/fs/cgroup/system.slice/systemd-logind.service/memory.zswap.current
/sys/fs/cgroup/system.slice/systemd-logind.service/memory.zswap.writeback
/sys/fs/cgroup/system.slice/systemd-logind.service/memory.zswap.max
/sys/fs/cgroup/proc-sys-fs-binfmt_misc.mount/memory.zswap.current
/sys/fs/cgroup/proc-sys-fs-binfmt_misc.mount/memory.zswap.writeback
/sys/fs/cgroup/proc-sys-fs-binfmt_misc.mount/memory.zswap.max
/sys/fs/cgroup/memory.zswap.writeback
/sys/fs/cgroup/dev-hugepages.mount/memory.zswap.current
/sys/fs/cgroup/dev-hugepages.mount/memory.zswap.writeback
/sys/fs/cgroup/dev-hugepages.mount/memory.zswap.max
/sys/module/zswap
/sys/module/zswap/uevent
/sys/module/zswap/parameters
```

```

/sys/module/zswap/parameters/same_filled_pages_enabled
/sys/module/zswap/parameters/enabled
/sys/module/zswap/parameters/shrinker_enabled
/sys/module/zswap/parameters/max_pool_percent
/sys/module/zswap/parameters/compressor
/sys/module/zswap/parameters/non_same_filled_pages_enabled
/sys/module/zswap/parameters/zpool
/sys/module/zswap/parameters/exclusive_loads
/sys/module/zswap/parameters/accept_threshold_percent
/usr/lib/modules/6.8.4-arch1-1/build/include/linux/zswap.h

```

However, looking at the `/proc/cmdline` file on my system, the `zswap` feature seems to be disabled with the `zswap.enabled=0` kernel parameter...

zram configuration file: `/etc/systemd/zram-generator.conf`

Linux swappiness

`vm.swappiness` kernel parameter delegates between prioritizing freeing up anonymous (stack/heap) memory or file pages from RAM! <https://www.howtogeek.com/449691/what-is-swappiness-on-linux-and-how-to-change-it/>

Set the `vm.swappiness` value in the bootloader config to change it! Value of 100 completely balances the priority

Virtual file system (VFS):

https://www.usenix.org/legacy/publications/library/proceedings/usenix01/full_papers/kroeger/kroeger_html/node8.html

Disk partitioning and memory swap setup

Linux filesystem type uuid in GPT (partition table scheme that's better than MBR):

`0FC63DAF-8483-4772-8E79-3D69D8477DE4`

Result of running `fdisk -l /dev/nvme0n1` on my system:

```

Disk /dev/nvme0n1: 1.82 TiB, 2000398934016 bytes, 3907029168 sectors
Disk model: Samsung SSD 990 PRO with Heatsink 2TB
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 98B655AF-F448-42E0-95A7-EFB7568C9B62

```

Device	Start	End	Sectors	Size	Type
/dev/nvme0n1p1	2048	1050623	1048576	512M	EFI System
/dev/nvme0n1p2	1050624	3907026943	3905976320	1.8T	Linux filesystem

New storage partition endpoint: 3222276096 (each sector is 512 bytes, and $512 * \text{value} = 1.5 \text{ TiB}$ ($1.5 * 1024^4$ bytes))

swap partition type: `0657FD6D-A4AB-43C4-84E5-0933C84B4F4F` (type 19 in GPT partition scheme with fdisk)

`lsblk` - for listing block devices

`blkid` - to listing block device id's `fdisk -l` - for inspecting disks and partitions, and `fdisk <dev>` for partitioning disks parted - another interface for partitioning disks (though fdisk is better since it doesn't immediately write changes to the disk)

`cryptsetup` - utility for working with LUKS-encrypted partitions `mkswap` - utility for creating swap file system (assigns new UUID to device, and can assign labels! See Arch wiki page for "persistent block device naming")

New `/dev/nvme0n1p3` swap partition:

UUID=`364f2c1a-e241-425b-ac75-b96a4f6a3ea7`

PARTUUID=`364f2c1a-e241-425b-ac75-b96a4f6a3ea7`

LABEL=`SWAP`

Can also find all these persistent name mappings under `/dev/disk/by-*` with a bunch of symlinks!

See: https://wiki.archlinux.org/title/persistent_block_device_naming

PROCEDURE FOR MOUNTING A SWAP PARTITION:

FIRST CREATE A PARTITION using `fdisk <disk>` WITH THE "Linux swap" filesystem type (nothing too special about it...)

THEN

```
$ sudo mkswap /dev/<disk>
$ sudo swapon --label=LABEL /dev/<disk>
```

THEN FINALLY ADD A NEW ENTRY TO `/etc/fstab` AS FOLLOWS:

```
LABEL=LABEL none swap defaults,pri=<number> 0 0
```

YOU CAN DISABLE/UNMOUNT THE SWAP PARTITION USING `swapoff`

TO CREATE A SWAP FILE IN BTRFS, EXECUTE THE FOLLOWING

```
$ sudo truncate -s 0 /swapfile # Create empty file at root
$ sudo chattr +C /swapfile # No Copy-on-Write (COW) permission, e.g. for
subvolume snapshots
$ sudo chmod 0600 /swapfile # Set permissions
$ sudo fallocate -l <size> /swapfile # Set swapfile size
$ sudo mkswap /swapfile # Create the proper swapfile type
$ sudo swapon /swapfile # Mount the swapfile
```

THEN TO MAKE IT MOUNT AFTER REBOOT, ADD THE FOLLOWING TO the end of `/etc/fstab` (columns separated by tabs)

```
/swapfile none swap defaults,pri=100 0 0
```

TO DISABLE THE SWAPFILE, USE `swapoff`

USE `swapon -s` or `free -h` to display swap usage stats!

Setting up hibernation in Arch

Finally, to use this swapfile (or any swap partition) for hibernating

- First get the btrfs disk offset for swap files using

```
$ btrfs inspect-internal map-swapfile -r /swapfile # See btrfs online docs for more info
```

Then write this offset using `echo <offset> | sudo tee /sys/power/resume_offset`

- Then add the following as kernel parameters to the `/boot/loader/entries/*.conf` boot config file at the end of the `options` line

```
resume=/dev/<device> resume_offset=<offset>
```

NOTE: `resume_offset` is NOT REQUIRED for swap partitions (just set the `resume` option to partition device, e.g. `/dev/nvme0n1p3`)

NOTE: for swap files, `resume` contains the block device (under `/dev`) for the file system containing the swap file

- You also MUST add the `resume` hook to the HOOKS listing in the `/etc/mkinitcpio.conf` initramfs image config file (which is pretty much just like a Dockerfile for initramfs/early user space images -- also, as aside, `cpio` is a compression scheme). Then rebuild the initramfs image(s) using `sudo mkinitcpio -P`
- FINALLY, to hibernate immediately by shutting down and commit the kernel changes, write the swap file root filesystem (or swap partition) device location to `/sys/power/resume` by invoking the following:

For example, in btrfs, the root filesystem device for a LUKS encrypted partition is given by `/dev/mapper/root`

```
$ echo /dev/<device> | sudo tee /sys/power/resume
$ echo shutdown | sudo tee /sys/power/disk
$ echo disk | sudo tee /sys/power/state
```

- You can also modify the `/etc/systemd/sleep.conf` config file and invoke hibernation (in a safer way) using

```
$ sudo systemctl hibernate
```

See https://wiki.archlinux.org/title/Power_management/Suspend_and_hibernate and <https://man.archlinux.org/man/systemd-sleep.8> for full details

`dmidecode --type 17` -- list memory (RAM) specs

`/usr/lib/initcpio/` -> contains `initramfs` hook run and build scripts!! This is how disk decryption occurs using the `encrypt` hook!

`/etc/mkinitcpio.conf` -> specifies the resources included in the `initramfs` file which is mounted as an early user space `tmpfs/ramfs` type filesystem in RAM so the necessary setup steps can occur, such as decrypting the disk and resuming from the hibernation image!

Kernel parameters and Disk/filesystem stats

`sysctl` - set and probe kernel parameters

`systemctl (for systemd)` - manage system services/daemons launched during `init` late in the boot process, when the main userspace is spawned

`modprobe` - hotload and probe kernel modules (such as `zram/zswap`) while the system is running

`filefrag` - list fragmentation status and disk offset of a given file

`btrfs` - utility for creating and managing `btrfs`-formatted file systems

`dmsetup` - Linux utility for creating and managing logical block devices that can fuse multiple physical volumes together! Underlies the LVM technology! Kernel feature known as "disk mapping". Pretty darn cool! Used for secure encrypted disk I/O using the Linux kernel's Crypto API too!

Learn more: <https://man7.org/linux/man-pages/man8/dmsetup.8.html>

Think of disk mapping as making a block device that communicates with (multiple) other devices, while also possibly encrypting/decrypting data! For example, you can make a linear mapping to two other drives that appear under one block device interface! Really neat! Use `dmsetup` to query about the status of the virtual block devices created that map to other storage devices!

Block/character special files

Block and character special *device* files can be created using `mknod` and are special buffered (block) or unbuffered (character) interfaces to physical devices, which are interfaced with using device drivers loaded in by the kernel, with the device files created under `/dev` by `udev` and attached during boot to the correct drivers according to the device's major number! Every device file has a major (which designates the device type) and minor (which designates different devices under the same major number/driver) number, which can be used to uniquely identify the device (e.g., 259:2 for `/dev/nvme0n1p2`)! See <https://www.kernel.org/doc/Documentation/admin-guide/devices.txt> for an exhaustive device numbers reference. `ls -l` can be used to obtain device types and numbers, for example:

```
crw-rw----+ 1 root video 226, 1 Apr 15 06:39 /dev/dri/card1
```

The first character in the first column indicates character (c) or block (b) special. The comma separated values represent the major:minor numbers (e.g. 226:1 for the device above, which designates rendering infrastructure). `udev` is the main daemon for handling device events, and `udevadm` is the utility for interfacing

with `udev` <https://man7.org/linux/man-pages/man7/udev.7.html>

All `/devices/**` paths returned by `udevadm info /dev/<dev>` for some device are under the `/sys/` sysfs Linux interface! The `/sys/devices` path contains configured parameters for different devices (like all kernel parameters are under `/sys/kernel` with a different file for each ending parameter the intermediary values being directories, e.g. `net.io.speed` is stored in `/sys/kernel/net/io/speed`). Use `udevadm info -a` to traverse the parameter tree for a given device. Device rule files are located under `/lib/udev` among other locations...

NOTE: `/dev/nvme0` is the NVMe *memory controller* that communicates over PCIe while `/dev/nvme0n1` is the actual NVMe drive! Then `/dev/nvme0n1p<n>` is the n'th partition!

Disk encryption

`cryptsetup` - used to encrypt/decrypt LUKS devices using the kernel feature, and invokes `dmsetup` to create the necessary logical (virtual) block device mapping under `/dev/mapper` to the decrypted disk volume, so that data is encrypted/decrypted while *passing through* the block device as handled (and buffered) by the configured Linux kernel driver! This means that the disk is never actually fully decrypted and exposed, but rather the virtual mapping is made so the disk is accessible and encryption/decryption of data is done on the fly using the Linux kernel's Crypto API as the user reads and write to the disk! Learn more:

<https://man7.org/linux/man-pages/man8/cryptsetup.8.html>, https://en.wikipedia.org/wiki/Device_mapper

Think of `cryptsetup` as LUKS functionality for the `dmutil` "crypt" target (aka dm-crypt)! Use `cryptsetup` to get information about the *still encrypted* volume device, and `dmutil` to get information about the virtual block device! `cryptsetup` encrypts the drives themselves, allows for creating the password, specifies the proper crypt target and table spec for creating the block device with `dmsetup`, etc., while `dmutil` just provides a virtual device interface for communicating with the encrypted volume in a secure way according to the encryption method.

NOTE: Device files *don't* actually take up space on the system! They are like named pipes, just there to interface with the physical/virtual devices!

Something interesting:

Try to create the virtual block device mapping from the encrypted `/dev/nvme0n1p2` partition device (using `cryptsetup open /dev/nvme0n1p2 root`), which will create the mapping on `/dev/mapper/root`, which is symlinked to the actual `/dev/dm-0` virtual block device file. Then use `dmsetup table /dev/mapper/root` to get the following output:

```
0 3221192705 crypt aes-xts-plain64 :64:logon:cryptsetup:8c018527-ba92-43eb-9b1d-8508ec7c43d5-d0 0 259:2 32768
```

The second value minus the first gives the number of sectors writable on the block device, starting from volume sector 32768, in the count of 512 byte sectors. Hence multiplying the difference by 512 gives the total number of writable bytes on the volume. Now, use `btrfs inspect-internal dump-super /dev/mapper/root` to get the following output of the device's *superblock* (basically the main filesystem header -- learn more: https://archive.kernel.org/oldwiki/btrfs.wiki.kernel.org/index.php/On-disk_Format.html):

```
superblock: bytenr=65536, device=/dev/mapper/root
```

csum_type	0 (crc32c)
csum_size	4
csum	0x3cfa606c [match]
bytenr	65536
flags	0x1
	(WRITTEN)
magic	_BHRfS_M [match]
fsid	c754e01e-710e-413d-bdc3-307abb4545c6
metadata_uuid	00000000-0000-0000-0000-000000000000
label	
generation	19309
root	814055424
sys_array_size	129
chunk_root_generation	19249
root_level	0
chunk_root	23068672
chunk_root_level	1
log_root	800866304
log_root_transid (deprecated)	0
log_root_level	0
total_bytes	1649267441664
bytes_used	254290964480
sectorsize	4096
nodesize	16384
leafsize (deprecated)	16384
stripesize	4096
root_dir	6
num_devices	1
compat_flags	0x0
compat_ro_flags	0x3
	(FREE_SPACE_TREE
	FREE_SPACE_TREE_VALID)
incompat_flags	0x361
	(MIXED_BACKREF
	BIG_METADATA
	EXTENDED_IREF
	SKINNY_METADATA
	NO_HOLES)
cache_generation	0
uuid_tree_generation	19309
dev_item.uuid	547b5791-e37d-4d95-81ce-79c95bfe3d9f
dev_item.fsid	c754e01e-710e-413d-bdc3-307abb4545c6 [match]
dev_item.type	0
dev_item.total_bytes	1649267441664
dev_item.bytes_used	263091912704
dev_item.io_align	4096
dev_item.io_width	4096
dev_item.sector_size	4096
dev_item.devid	1
dev_item.dev_group	0
dev_item.seek_speed	0
dev_item.bandwidth	0
dev_item.generation	0

and take note of the `dev_item.total_bytes` value. This is the total size, in bytes, the file system, and notice how this is bigger from the product found above, and by exactly 32767 bytes. This is because the writable area for filesystem on the volume starts at sector 32768, *after* the 32757 byte security header generated for the filesystem by `cryptsecret` when the filesystem was first generated and encrypted! Now, because of this, if the `/dev/mapper/root` device were to be mounted using `mount /dev/mapper/root /mnt`, or inspected using `btrfs check --force /dev/mapper/root` (`--force` is needed for a mounted filesystem), the error

```
block device size is smaller than total_bytes in device item, has
1649250664960 expect >= 1649267441664
```

is generated. However, this is okay and the device is not misaligned with the partition's filesystem area! It's simply because of the way `cryptsetup` sets the partition up with where it writes the file system that this happens, and the allocated block device is set up to start writing/reading encrypted data at the sector where the filesystem begins, and the security header (containing the encryption key) is written along with the filesystem.

Git commit signing using `gpg` and how key pairs work

Sign and verify commit signatures using git:

<https://medium.com/@petehouston/quick-guide-to-sign-your-git-commits-c11ce58c22e9>

<https://www.cloudwithchris.com/blog/gpg-git-part-2/>

All about subkeys!: <https://wiki.debian.org/Subkeys>

Use `gpg` for creating code-signing keys/sub-keys that you can then publish to the ubuntu keyshare and add to GitHub! Private sub-keys are used for signing/decryption, while the primary key is only ever used for making *major* changes to the keypair, like changing the password.

All you have to do is generate a signing key-pair on the machine using `gpg`, then add the *public* key in ASCII-armor format (given by `gpg --armor --export <keyid>`) to your GitHub profile! You then just tell your local `git` install to sign your commits using your *private* key by setting `git config --global user.signingkey=<keyid>` and then telling `git` to use your local `gpg` install for signing with `git config --global gpg.program=$(which gpg)`.

Also, if there's an error like `gpg: signing failed: Inappropriate ioctl for device` while committing, run `export GPG_TTY=$(tty)` and add it to `~/.bashrc`.

See <https://docs.github.com/en/authentication/managing-commit-signature-verification>

You *encrypt* the message that's *sent* with the recipient's *public* key, and then the recipient *decrypts* it with their *private* key. And you *verify* the data that's *received* with the sender's *public* key, which they *sign* using their *private* key. Take sending and receiving data from your account on GitHub for instance. First you add your SSH *public* key to your GitHub profile. Then when receiving data over SSH for the first time from GitHub, their *public* key is given to you. Then you can *verify* that the data indeed came from GitHub using their *public* key and, you can *decrypt* the data using your *private* key, which they *encrypted* using your *public* key and *signed* using their *private* key! In the opposite direction, when *sending* data to GitHub, you *encrypt* it using GitHub's *public* key and *sign* it using your *private* key, and then they can only *decrypt* it using their *private* key (so you can be sure that only GitHub can read the data) and they *verify* that it came from you using your *public* key! Notice that GitHub *only* needs your public key and you *only* need their public key for this all to work, and the private key never leaves the owner's possession! Look at `~/.ssh/known_hosts` for GitHub's public keys.

This is pretty much how *any* communication over SSH takes place, where you place your public key on the server and you place theirs in `~/.ssh/known_hosts`!

Separating SSH and GPG keys this way ensures that even if someone else manages to get ahold of your SSH private key and can access your account, the commit would still show up as unverified if they don't also have one of your private GPG sub-keys, which you can easily deactivate and regenerate from your primary private key if it were also compromised.

You can also publish your public GPG keys on online keyshares such as

<https://keyserver.ubuntu.com/> so others can easily find them! Use `gpg --send-keys <keyid>` to do this. You can also search for keys on the keyserver by going to the website or using `gpg --search-keys <url> <search string>`.

Key servers: [https://en.wikipedia.org/wiki/Key_server_\(cryptographic\)](https://en.wikipedia.org/wiki/Key_server_(cryptographic))

Modifying `sudo` and `PAM` behavior

Configure `sudo` behavior using `/etc/sudoers` file with the "Defaults" directive:

https://www.sudo.ws/docs/man/sudoers.man/#SUDOERS_OPTIONS

Adding the line `Defaults insults, passwd_tries=5, timestamp_timeout=30` results in some interesting behavior now lol..

It also makes it so that max 5 attempts (instead of the default 3) are allowed, and user is authenticated for 30 min (instead of default 5)

NOTE: MODIFY THE `/etc/sudoers` FILE BY ONLY INVOKING THE FOLLOWING

```
$ EDITOR="code -r --no-sandbox --user-data-dir=/.vscode --wait" visudo
```

SINCE A LOCKFILE IS CREATED IN THAT CASE

Note that `sudo` internally uses Linux PAM (Pluggable Authentication Modules) for authentication, which is a set of kernel libraries for performing modular authentication (i.e. configuring custom authentication methods for different programs), with the program configs specified under `/etc/pam.d/`. In particular, the `/etc/pam.d/sudo` file specifies the configuration for `sudo`, which itself just derives from the built-in `/etc/pam.d/system-auth` default auth scheme. In short, PAM works by invoking different modules (really compiled C object files) with certain option arguments for handling different parts of the auth flow (learn more: <https://man.archlinux.org/man/core/pam/PAM.8.en>).

Take note of the `pam_faillock.so` module in particular, which handles whether the user is rejected after authentication is attempted: how this is handled is configured in `/etc/security/faillock.conf`, which specifies all the options that could also be passed when the module is invoked, such as the max no. of authentication attempts before rejection, and the (irritating) lockout period for the user after the max allowed attempts is reached. (NOTE: Modifying this file will be effective immediately since `faillock.so` isn't really a running daemon/service but a program that's invoked which reads the config). The interesting bit is how the lockout period and other options seem to have an immediate effect on `sudo` usage, yet changing the max number of attempts allowed doesn't seem to change anything. This is because this is overridden by `sudo` itself, and the option in `/etc/security/faillock.conf` just sets the default for *all* programs that don't override it! Therefore, to change the max number of attempts, you must modify the `sudoers` file using `visudo`, but all other (tested) behavior can be changed in `faillock.conf`.

LEARN MORE: <https://man.archlinux.org/man/core/pam/faillock.conf.5.en>

NOTE: The `faillock` command line utility can be used to reset the current user's failed attempts (tracked in

`/var/run/faillock/<user>`) using `faillock --reset` thereby bypassing the lockout. Also, `sudo -k` can be used to reset the current user's root auth status (so they have to enter their password on the next usage)

Using the Arch User Repository (AUR)

Download and install packages from source on ARCH from the AUR using PKGBUILD files:

https://wiki.archlinux.org/title/Arch_User_Repository

Simply clone the repo, `cd` into it, then run `make -sic` to build and install the package! Just be sure to VET the repo thoroughly though since it's all user contributed stuff and not at all verified for security! Look through the PKGBUILD file, consider the popularity of the package, look through comments, look at how recent the latest update was, etc... There are also helpers made for this process, such as `yay`, but they're really not needed...

Querying GPU/CPU stats

Use `radeontop` or `nvtop` to query status of AMD CPU/GPU hardware (which can be installed using the main `pacman -S` package manager in Arch)