·····CPU·I/O·····

·····

····· CPU··· I/O·····
····· I/O ·····

·····

pidstat ····· CPU·I/O ····· PID ·····iostat ·····
·····/proc/pressure ·····
··

·· | ···· | ··

pidstat CPU / I/O | ····· | ·····

iostat await / ·· / ·· | ····· | ·····

PSI cpu / io / memory | ····· | ·····

findmnt | ····· | ·····

·····

····· PID··· BACKGROUND_PID····· PID·SNAP ····· WORKDIR ·
·····PSI ····· total
·····

```
set -euo pipefail
: "${ANALYSIS_PID:?·····PID}" "${WORKDIR:?·····}" "${SNAP:?·····}"
[[ "$ANALYSIS_PID" =~ ^[1-9][0-9]*$ ]] || exit 2
pids="$ANALYSIS_PID"
test -r "/proc/$ANALYSIS_PID/status"
if [[ -n "${BACKGROUND_PID:-}" ]]; then
  [[ "$BACKGROUND_PID" =~ ^[1-9][0-9]*$ && "$BACKGROUND_PID" != "$ANALYSIS_PID" ]] || exit 2
  test -r "/proc/$BACKGROUND_PID/status"
  pids+=",$BACKGROUND_PID"
fi
test -d "$WORKDIR" && test ! -e "$SNAP" && test ! -L "$SNAP"
mkdir -p "$(dirname "$SNAP")"; mkdir "$SNAP"
date -Is > "$SNAP/start.txt"
findmnt --target "$WORKDIR" -o TARGET,SOURCE,FSTYPE > "$SNAP/storage.txt"
findmnt --target "$(dirname "$SNAP")" -o TARGET,SOURCE,FSTYPE > "$SNAP/snapshot-storage.txt"
pidstat -V > "$SNAP/sysstat-version.txt"
pidstat -u -d -w -p "$pids" 1 60   > "$SNAP/processes.txt" & p1=$!
iostat -x -y -t 1 60 > "$SNAP/devices.txt" & p2=$!
cleanup() { kill "$p1" "$p2" 2>/dev/null || true; wait "$p1" "$p2" 2>/dev/null || true; }
trap cleanup EXIT
for r in cpu io memory; do
  if test -r "/proc/pressure/$r"; then cat "/proc/pressure/$r" > "$SNAP/$r.before"; fi
done
wait "$p1"; wait "$p2"
trap - EXIT
for r in cpu io memory; do
  if test -r "/proc/pressure/$r"; then cat "/proc/pressure/$r" > "$SNAP/$r.after"; fi
done
date -Is > "$SNAP/end.txt"
```

iostat -y ·····pidstat · iostat ·····
····· CPU ·····
·····

·····

····· CPU · I/O ·····
·····

```
set -euo pipefail
: "${BACKGROUND_JOB:?·····}"
: "${BACKGROUND_OUT:?·····}"
test -s "$BACKGROUND_JOB"
test ! -e "$BACKGROUND_OUT" && test ! -L "$BACKGROUND_OUT"
# ·····
nice -n 10 ionice -c 2 -n 7   bash "$BACKGROUND_JOB" "$BACKGROUND_OUT"
```

nice ·· CPU ····· CPU ···ionice · best-effort ····· MB/s ····· I/O ·····
·····

·····

· findmnt ····· NFS ····· io
stat ····· I/O ···

····· CPU ····· I/O PSI ·····
····· scratch·iostat ·····

·····
·····
·····

····

sysstat··iostat·····y·· https://github.com/sysstat/sysstat/blob/master/man/iostat.in

sysstat··pidstat····· https://github.com/sysstat/sysstat/blob/master/man/pidstat.1

Linux··PSI···· https://docs.kernel.org/accounting/psi.html

GNU coreutils nice····· https://www.gnu.org/software/coreutils/manual/html_node/nice-invocation.html

util-linux ionice·· https://www.man7.org/linux/man-pages/man1/ionice.1.html