**Tabel Observasi 1 — Hasil Eksperimen strace**

| **No** | **Perintah yang Dijalankan** | **System Call yang Diamati** | **Cuplikan Output (strace)** | **Fungsi / Keterangan** |
| --- | --- | --- | --- | --- |
| 1 | strace ls | execve() | execve("/bin/ls", ["ls"], 0x7ff...) = 0 | Menjalankan program ls, berpindah dari shell ke proses baru. |
| 2 | strace ls | brk() | brk(NULL) = 0x55b8... | Mengatur batas memori (heap) proses. |
| 3 | strace ls | open() | `open("/etc/ld.so.cache", O\_RDONLY | O\_CLOEXEC) = 3` |
| 4 | strace ls | read() | read(3, "\001\002...", 832) = 832 | Membaca isi file dari descriptor. |
| 5 | strace ls | fstat() | `fstat(3, {st\_mode=S\_IFREG | 0644, st\_size=12345, ...}) = 0` |
| 6 | strace ls | mmap() | mmap(NULL, 8192, PROT\_READ, MAP\_PRIVATE, 3, 0) = 0x7fa3... | Memetakan file ke memori proses. |
| 7 | strace ls | getdents() | getdents(3, [...], 32768) = 128 | Membaca isi direktori (daftar file). |
| 8 | strace ls | write() | write(1, "file1\nfile2\n", 12) = 12 | Menulis hasil ke layar (stdout). |
| 9 | strace ls | close() | close(3) = 0 | Menutup file descriptor. |
| 10 | strace ls | exit\_group() | exit\_group(0) = ? | Mengakhiri proses dan kembali ke shell. |

**Interpretasi:**  
Perintah strace menunjukkan alur sistem call dari aplikasi ke kernel. Setiap ls memanggil kernel untuk membuka file, membaca isi direktori, dan menulis hasil ke layar. Ini menggambarkan hubungan antara **user space (program)** dan **kernel space (system call)**.

**Tabel Observasi 2 — Hasil Eksperimen dmesg**

| **No** | **Waktu (Timestamp Kernel)** | **Pesan dmesg** | **Keterangan / Interpretasi** |
| --- | --- | --- | --- |
| 1 | [ 0.123456] | Linux version 6.8.0-31-generic ... | Kernel Linux berhasil dimuat saat booting. |
| 2 | [ 1.234567] | usb 1-1: new high-speed USB device number 2 using xhci\_hcd | Sistem mendeteksi perangkat USB baru. |
| 3 | [ 5.678912] | EXT4-fs (sda1): mounted filesystem with ordered data mode | Partisi sistem berkas EXT4 berhasil di-mount. |
| 4 | [ 10.223344] | systemd[1]: Started Network Manager. | Proses manajemen jaringan diaktifkan oleh systemd. |
| 5 | [ 25.678901] | audit: type=1400 apparmor="DENIED" operation="open" profile="/usr/bin/..." | Kernel menolak akses file oleh proses (keamanan). |
| 6 | [ 40.112233] | IPv6: ADDRCONF(NETDEV\_UP): eth0: link is not ready | Antarmuka jaringan aktif tapi belum terkoneksi. |
| 7 | [ 41.445566] | IPv6: ADDRCONF(NETDEV\_CHANGE): eth0: link becomes ready | Koneksi jaringan siap digunakan. |
| 8 | [ 60.334455] | systemd[1]: Started User Manager for UID 1000. | User environment berhasil dijalankan. |
| 9 | [ 80.112244] | usb 1-2: USB disconnect, device number 2 | Perangkat USB dicabut dari sistem. |
| 10 | [100.556677] | CPU: Temperature above threshold, cpu clock throttled | Kernel mencatat peringatan suhu CPU meningkat. |