Measuring Memory Usage

LPIC-2: Linux Engineer (201-450)

Objectives:

At the end of this episode, I will be able to:

1. Identify tools used to monitor memory performance in Linux.
2. Utilize free, top, sar, and vmstat to view memory metrics.

> Additional resources used during the episode can be obtained using the download link on the overview episode.

- Why monitor memory utilization
    - Application memory leaks
    - Excessive paging
    - Uncommitted data changes
    - Excessive user connections
- Getting a quick view of memory usage
    - Current memory statistics
        - `free`
        - `free -h` (Human readable storage sizes)
        - `free -s 5` (Refresh every 5 seconds)
- *top* and *htop*
    - Display memory usage alongside other data
    - Press `M` to sort by memory
    - Press `m` to change memory meter
- Historical memory usage
    - Tools like *sar* in the *sysstat* package are better suited
    - `sar -r` for physical memory
- Monitoring Swap with *sar*
    - `sar -S` for swap space utilization
    - `sar -W` for swap page in/out
- Monitoring virtual memory with *vmstat*
    - `vmstat 5` refreshes every 5 seconds
    - `vmstat -s` displays a summary
- Key stats
    - Page In
        - Normally good
        - Something going into RAM
    - Page Out
        - Good in small quantities
        - Bad in large quantities
        - Something being bumped to free up space

- Swap In
  - Bad in all but small quantities
  - Something moving from RAM to disk