

Monitoring and Performance Utilities

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Linux distributions come with many standard performance and profiling tools already installed. Some of them may be familiar from other UNIX-like operating systems, while others were developed specifically for Linux.

Many of these tools gather their information from the **/proc** pseudo-filesystem. There are also graphical system monitors that, while hiding many of the details, are still extremely useful. We will consider available graphical interfaces after detailing the command line utilities.

Before considering the main utilities in some detail, we will give a brief summary. We will break them down by type, although some of the utilities have overlapping domains of coverage. We will also give the name of the package they belong to, which is not important and may vary among different Linux distributions and releases.

Process and Load Monitoring Utilities

Utility	Purpose	Package
top	Process activity, dynamically updated	procps
uptime	How long the system is running and the average load	procps
ps	Detailed information about processes	procps
pstree	A tree of processes and their connections	psmisc (or pstree)
mpstat	Multiple processor usage	sysstat
iostat	CPU utilization and I/O statistics	sysstat
sar	Display and collect information about system activity	sysstat
numastat	Information about NUMA (Non-Uniform Memory Architecture)	numactl
strace	Information about all system calls a process makes	strace

Memory Monitoring Utilities

Utility	Purpose	Package
free	Brief summary of memory usage	procps
vmstat	Detailed virtual memory statistics and block I/O, dynamically updated	procps
pmap	Process memory map	procps

I/O Monitoring Utilities

Utility	Purpose	Package
iostat	CPU utilization and I/O statistics	sysstat
iotop	I/O statistics including per process	iotop
sar	Display and collect information about system activity	sysstat
vmstat	Detailed virtual memory statistics and block I/O, dynamically updated	procps

Network Monitoring Utilities

Utility	Purpose	Package
netstat	Detailed networking statistics	netstat
iptraf	Gather information on network interfaces	iptraf
tcpdump	Detailed analysis of network packets and traffic	tcpdump
wireshark	Detailed network traffic analysis	wireshark