

WEB PARMON

Cluster computing systems consist of inexpensive workstations connected by a network. Any user from a remote place can login into the cluster and submit a job. It is useful to know the status of cluster before submitting a job. Webparmon enables the user to monitor the cluster over Internet through a web browser.



Web PARMON Architecture



Web PARMON invoked from Internet Browser- Listing users

PARMON HELP

PARMON offers comprehensive help. The user can choose the functionality in the main help menu and then navigate to specific details of how each service can be accessed and interpreted. PARMON online help also has a glossary of technical terms and parameters that are often used in PARMON among the cluster computing community.

AVAILABILITY

Supported Hardware	:	Workstation Clusters, PC
Supported OS	:	AIX, Solaris and Linux
Prerequisite Software	:	Java and Swing Supported Browser

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DESCRIPTION

PARMON allows the user to monitor activities and resource utilization of various components of workstation clusters. It monitors the machine both at node level and at the entire system level exhibiting a single system image. PARMON monitors process activities, system log, kernel activities; and allows the generation and analysis of events. It also provides a logical view of the components of the system.



PARMON launcher

KEY FEATURES

- ▶ Supports monitoring of cluster at node level, group level or entire system level
- ▶ Allows monitoring of system resources and their parameters at both macro and micro level.
- ▶ Supports listing of system information and machine configuration of all nodes of a cluster.
- ▶ Allows the user to build system database of nodes and groups.
- ▶ Exploits latest software technologies like Java to provide portability across platforms.
- ▶ Provides web interface for cluster monitoring over the internet

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SYSTEM MODEL

PARMON consists of *parmon* client and *parmond* server. The nodes to be monitored serve as servers that can be monitored from any workstation, PC or node of a cluster itself. The *parmond* server is loaded on all the nodes that are to be monitored. The client communicates requests to the servers to be monitored and collects the data. The client interprets the data and converts it into an appropriate format for graphical presentation.

A client can either monitor all the nodes or selectively monitor a few nodes of a cluster. For effective monitoring the concept of group is supported. A set of nodes form a group, which is created based on the allocation of resources to various user groups. Such grouping mechanism helps in monitoring and gathering usability statistics with which the system administrator can change the resource allocation strategy.



Process list and logical view of disk

MONITORING FEATURES

PARMON allows monitoring of the following system activities and parameters

Process Activities

The utilization of the CPU resources can be measured by monitoring process activities. The parameters that can be monitored using PARMON are: command, process id, process state, user id, user name, cpu time, memory used, cpu assigned. The user can filter information based on process name or user name.



CPU and network usage statistics

System Logs

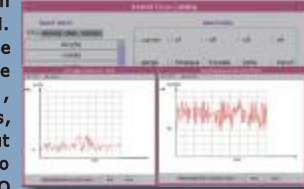
PARMON helps in the effective monitoring of the system logs maintained by the Operating System. PARMON allows to process system messages for entries that occur at specific time or for entries that contain a specific keyword or pattern.

Kernel Activities

PARMON supports software instrumentation of system resources such as CPU, Disk, Memory and Network. When a particular resource has more than one instance, PARMON allows the individual monitoring of each resource instance.

CPU Parameters

The monitoring of CPU parameters helps in understanding how the CPU is being utilized. PARMON allows to monitor graphically the following : busy, user, wait and idle percentages of CPU, number of interrupts, context switches, system calls, forks, execs, page in, page out, swap in and swap out operations per second. It also allows to monitor the process run queue length and IO queue length.



Kernel Data catalog for Software Instrumentation

Memory Parameters

PARMON allows continuous instrumentation of memory availability, memory in use, free memory and their percentages, swap statistics such as reserved swap space, allocated swap space and available swap space.

Disk Parameters

PARMON monitors disk operations such as reads, writes, number of jobs waiting in the queue for disk services, disk run time and disk wait time.

Network Parameters

The software instrumentation of network parameters such as input packets, output packets, errors in packet transmission helps to detect network bottlenecks. PARMON displays the percentage of incoming and outgoing data packets containing packet format errors.

LOGICAL VIEW

The Logical View displays system components in a hierarchical manner. System components include processing elements, file system, network components, which are probed dynamically. Each item in the hierarchy diagram can be probed further for detailed information. For instance, when a file system is probed, it displays all the logical partitions of the disk and other details such as partition name, disk space allocated and disk space used.

EVENT GENERATION

PARMON triggers an event such as sending email when the user crosses the resource utilization limits. This helps the administrator to have effective control over machine resource utilization.