

# TIVOLI DATA WAREHOUSE HANDBOOK

## UNIX

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## Table SYSTEM

*System attributes refer to system characteristics such as the amount of available virtual memory, idle CPU percentage, the number of non-block device reads, and load averages.*

Active Virtual Memory	The amount of virtual memory, in kilobytes, currently in use by the system.
Avg Page Ins 1 min	The average rate of page ins over the last 1 minute.
Avg Page Ins 15 min	The average rate of page ins over the last 15 minutes.
Avg Page Ins 5 min	The average rate of page ins over the last 5 minutes.
Avg Page Ins 60 min	The average rate of page ins over the last 60 minutes.
Avg Page Out 1 min	The average rate of page outs over the last 1 minute.
Avg Page Out 15 min	The average rate of page outs over the last 15 minutes.
Avg Page Out 5 min	The average rate of page outs over the last 5 minutes.
Avg Page Out 60 min	The average rate of page outs over the last 60 minutes.
Avg Page Scan 1 min	The average rate of page scans over the last 1 minute.
Avg Page Scan 15 min	The average rate of page scans over the last 15 minutes.
Avg Page Scan 5 min	The average rate of page scans over the last 5 minutes.
Avg Page Scan 60 min	The average rate of page scans over the last 60 minutes.
Avg Processes RunQueue 60 min	The average number of processes in the run queue over the last 60 minutes.
Block Reads	The number of physical block reads over a specified sampling period.
Block Writes	The number of physical block writes (synchronous+ asynchronous) over a specified sampling period.
CPU Busy	The sum of the System and User CPU attributes in percent.
CPU Context Switches	Number of CPU context switches over the sampling interval.
Device Interrupts	The number of non-clock device interrupts over the sampling interval.
Execs Executed	The number of execs executed over a specified sampling period.
Forks Executed	The number of forks executed over the sampling interval.
Free Memory	The amount of memory, in kilobytes, currently available on the system.
Idle CPU	The percentage of time the CPU is not processing instructions.
Load Ave 1 Min	The average number of processes in the run queue of the UNIX kernel during the last minute.
Load Ave 15 Min	The average number of processes in the UNIX kernel run queue during the last fifteen minutes.
Load Ave 5 Min	The average number of processes in the UNIX kernel run queue during the last five minutes.
Logical Block Reads	Number of logical block reads of system buffers during the sampling interval.
Logical Block Writes	Number of logical block writes of system buffers during the sampling interval.
NonBlock Reads	Number of physical block reads (synchronous + asynchronous) during the sampling interval.
NonBlock Writes	The number of raw I/O writes over a specified sampling period.
Page Faults	The average rate of page faults per second.
Page Ins	The average rate per second of page-in requests over a specified sampling period.
Page Ins Rate	The number of kilobytes that the virtual memory manager pages in per second.
Page Out Rate	The number of kilobytes that the virtual memory manager pages out per second.
Page Outs	The average rate per second of page-out requests over a specified sampling period.
Page Reclaims	The number of times during the monitoring interval that the system removed a page from the queue and used that page for another process.

Page Scan Rate	The average rate per second of pages examined over the sampling interval.
Page Scanning	The number of kilobytes that the virtual memory manager pages scans per second.
Pages Paged In	The average rate per second of pages that were paged-in from disk to system memory during the monitoring interval.
Pages Paged Out	The average rate per second of pages paged-out from system memory to disk during the monitoring interval.
Processes Idle	Number of processes currently in idle state.
Processes in Run Queue	The total number of processes that can be run (threads in AIX4 and above and Digital UNIX) waiting for execution by the CPU.
Processes Runnable	Number of processes waiting to be run.
Processes Running	Number of processes currently running on a processor.
Processes Sleeping	Number of processes currently in sleep state.
Processes Stopped	Number of processes currently in the stopped state.
Processes Waiting	The number of processes (or threads in AIX 4 1 and above and Digital UNIX) waiting for page operations.
Processes Zombie	Number of zombie processes.
Swap Space Free	Amount of swap space (in MB) available.
System Calls	Number of system calls made during the sampling interval.
System CPU	The percentage of CPU time devoted to executing UNIX system kernel code.
System Procs Number	The number of processes running on the system, including both system and user processes.
System Read	The number of read() and readv() system calls during the sampling interval.
System Write	Number of write() and writev() system calls over the sampling interval.
Total Real Memory	The total number of kilobytes of physical memory on a monitored system.
Total Virtual Memory	The total amount of disk space (in kilobytes) available for paging operations on a monitored system.
Up Time	The number of seconds that a monitored system has been running continuously.
User CPU	The percentage of processor time devoted to user processes.
Users Session Number	The number of interactive user sessions running.
Virtual Memory % Available	Percent of virtual memory available calculated by the agent using the formula: $100 - \text{Percent\_Virtual\_Memory\_Used}$ .
Virtual Memory % Used	Percent of virtual memory used calculated by the agent using the formula: $\text{Active\_Virtual\_Memory} / \text{Total\_Virtual\_Memory} * 100$ .
Wait I/O	The percentage of time the CPU spends waiting for I/O operations.

## Table DISK

*The Disk attributes refer to disk characteristics such as inode size, inodes used, mount point, and space available.*

Inode Size	The number of inodes allocated on a filesystem.
Inodes Free	The number of inodes currently available on your filesystem.
Inodes Used	The number of inodes currently allocated to files on the filesystem.
Inodes Used %	The percentage of inode space currently allocated to files.
Size	The total size of a filesystem, expressed in kilobytes.
Space Available	The amount of unused space currently available to non-superusers on a filesystem, expressed in kilobytes.
Space Available %	The percentage of space available.
Space Used	The amount of disk space currently in use on a filesystem, expressed in kilobytes.
Space Used %	The space currently used on the file system, expressed as a percentage of the sum of used and available space.

*Instance(s):*

*Mount Point, Name*

## Table DISK PERFORMANCE

*The Disk Performance attributes refer to disk operations such as data transfer rates, average waiting times, and percentage busy.*

Avg Queue	Average number of disk requests outstanding during the sampling period.
Avg Serv	Average amount of disk time used in milliseconds over the sampling period.
Avg Wait	Average time waiting for disk access expressed in milliseconds.
Busy %	The percentage of time a disk has been busy transferring data.
Transfer Rate	The number of data transfers per second during a monitoring interval.
Transferred Bytes	The total number of kilobytes that have been transferred during the recording interval.

*Instance(s):*

*Disk Name*

## Table NETWORK

*The Network attributes refer to network characteristics such as received count, sent count, network interface name, and interface status.*

Avg Collision Rate 1 min	The average number of collisions on all network interfaces over last one minute.
Avg Collision Rate 15 min	The average number of collisions on all network interfaces over last fifteen minutes.
Avg Collision Rate 5 min	The average number of collisions on all network interfaces over last five minutes.
Avg Collision Rate 60 min	The average number of collisions on all network interfaces over last sixty minutes.
Avg In Rate 1 min	The average number of frames received on all network interfaces over last one minute.
Avg In Rate 5 min	The average number of frames received on all network interfaces over last five minutes.
Avg In Rate 15 min	The average number of frames received on all network interfaces over last fifteen minutes.
Avg In Rate 60 min	The average number of frames received on all network interfaces over last sixty minutes.
Avg InErr Rate 1 min	The average number of frames with errors received on all network interfaces over last one minute.
Avg InErr Rate 5 min	The average number of frames with errors received on all network interfaces over last five minutes.
Avg InErr Rate 15 min	The average number of frames with errors received on all network interfaces over last fifteen minutes.
Avg InErr Rate 60 min	The average number of frames with errors received on all network interfaces over last sixty minutes.
Avg Out Rate 1 min	The average number of frames transmitted on all network interfaces over last one minute.
Avg Out Rate 5 min	The average number of frames transmitted on all network interfaces over last five minutes.
Avg Out Rate 15 min	The average number of frames transmitted on all network interfaces over last fifteen minutes.
Avg Out Rate 60 min	The average number of frames transmitted on all network interfaces over last sixty minutes.
Avg OutErr Rate 1 min	The average number of frames transmission errors on all network interfaces over last one minute.
Avg OutErr Rate 5 min	The average number of frames transmission errors on all network interfaces over last five minutes.
Avg OutErr Rate 15 min	The average number of frames transmission errors on all network interfaces over last fifteen minutes.
Avg OutErr Rate 60 min	The average number of frames transmission errors on all network interfaces over last sixty minutes.
Collisions	The number of times during the monitoring interval that a frame transmitted by the network interface collided with another frame.
Frames Received	The number of frames received by the interface during the monitoring interval.
Frames Transmitted	The number of frames transmitted by the interface during the sampling period.
Input Errors	The number of frames with errors received by the interface during the monitoring interval.
Output Errors	The number of frame transmission errors by the network interface during the monitoring interval.
Received Count	The number of frames received since the network interface was initialized.
Transmission Unit Max	The maximum packet size (in bytes) for the specified network interface.
Transmitted Count	The average number of eight-bit packets transmitted per second by an interface since initialization.

*Instance(s):*                      *Interface DNS Name, Interface IP Address, Network Interface Name*

## Table PROCESS

*The Process Attributes Group refer to process operations such as command executed, CPU utilization, real memory usage, and execution state.*

Context Switch	The number of CPU context switches for this process.
CPU %	The percentage of CPU used by this process.
CPU Utilization	The numerical value indicating the relative CPU intensity of a process.
Heap Size	The size of the heap for this process expressed in bytes.
Involuntary Context Switch	The number of involuntary context switches for the process.
Major Fault	The number of major fault requested by this process.
Memory %	The percentage of system memory used by this process.
Minor Fault	The number of page reclaims for the process.
Nice Value	The requested execution priority of a process, in relation to other processes.
Priority	The current execution priority value.
Read/Write	The number of characters read and write by this process.
Size	The resident set size of the process, in kilobytes.
Stack Size	The size of the stack for this process.
Thread Count	The total number of threads for the process.
Total CPU %	The percentage of CPU used since the process was started.
Virtual Size	The size of the virtual memory used by this process, in kilobytes.
<i>Instance(s):</i>	<i>Command, Process Command</i>

## Table NFS AND RPC STATISTICS

*The NFS / RPC Statistics group attributes refer to Network File System and Remote Procedure Call call rates and errors.*

NFS Client Calls	The number of calls made to a server during a monitoring interval.
NFS Client Calls Rejected	The number of calls rejected by a server during a monitoring interval.
NFS Client File Creates	The number of File Creates calls made to a server during the monitoring interval.
NFS Client File System Statistics Calls	The number of file statistics calls made within the monitoring interval.
NFS Client Get Attribute Calls	The number of calls made to determine what type of file is being called.
NFS Client Link Calls	The number of hard link reports made by a server during a pre-defined time interval.
NFS Client Lookups	The number of Lookups requests made by an NFS server during the monitoring interval.
NFS Client Make Directory Calls	The number of calls made to a server during a monitoring interval.
NFS Client Null Calls	The number of calls generated for checking connectivity to a server.
NFS Client Read Calls	The number of Read Directory calls read by a server during a monitored interval.
NFS Client Read Directory Calls	The number of Read Directory calls made to a server during a monitoring interval.
NFS Client Read Link Calls	The number of calls received by an NFS server to read a linked file during the monitoring interval.
NFS Client Rejected Call Percentage	The percentage of NFS calls rejected by a server during a monitoring interval.
NFS Client Remove Directory Calls	The number of Remove Directory calls made to a server during a monitoring interval.
NFS Client Remove File Calls	The number of Remove File calls made to a server during a monitoring interval.
NFS Client Rename File Calls	The number of Rename File calls made to a server during a monitoring interval.
NFS Client Root Calls	The number of NFS calls made to the server by the root during a monitoring interval.
NFS Client Set Attribute Calls	The number of NFS calls made to set the attributes of a file during a monitoring interval.
NFS Client Symbolic Link Calls	The number of Symbolic Link calls made to a server during a monitoring interval.
NFS Client Write Cache Calls	The number of Write Cache calls made to a server during a monitoring interval.
NFS Client Writes	The number of Writes calls made to a server during a monitoring interval.
NFS Server Calls	The number of Server Calls made from an NFS server during a monitoring interval.
NFS Server Calls Rejected	The number of calls rejected by a server during a monitoring interval.
NFS Server File Creates	The number of File Creates calls made to a server during the monitoring interval.
NFS Server File System Statistics Calls	The number of file statistics calls made within the monitoring interval.
NFS Server Get Attribute Calls	The number of calls made to determine what type of file is being called.
NFS Server Link Calls	The number of hard link reports made by a server during a monitoring interval.
NFS Server Lookups	The number of Lookups requests made by an NFS server during a monitoring interval.
NFS Server Make Directory Calls	The number of Make Directory calls made to a server during a monitoring interval.
NFS Server Null Calls	The number of calls generated for checking connectivity to a server.
NFS Server Read Calls	The number of Read Directory calls read by a server during a monitored interval.
NFS Server Read Directory Calls	The number of Read Directory calls made to a server during a monitoring interval.
NFS Server Read Link Calls	The number of calls received by an NFS server to read a linked file during the monitoring interval.
NFS Server Rejected Call Percentage	The percentage of NFS calls rejected by a server during a monitoring interval.
NFS Server Remove Directory Calls	The number of Remove Directory calls made to a server during a monitoring interval.
NFS Server Remove File Calls	The number of Remove File calls made to a server during a monitoring interval.

NFS Server Rename File Calls	The number of Rename File calls made to a server during a monitoring interval.
NFS Server Root Calls	The number of NFS calls made to server root during a monitoring interval.
NFS Server Set Attribute Calls	The number of NFS calls made to set the attributes of a file during a monitoring interval.
NFS Server Symbolic Link Calls	The number of Symbolic Link calls made to a server during a monitoring interval.
NFS Server Write Cache Calls	The number of Write Cache calls made to a server during a monitoring interval.
NFS Server Writes	The number of Writes made to a server during a monitoring interval.
RPC Client Calls Rejected by Server	The number of calls made by a client to a server that the server rejected, during a monitoring interval.
RPC Client Calls Retransmitted	The number of RPC packets retransmitted to an RPC server during a monitoring interval.
RPC Client Calls Timed Out	The number of times an RPC call from the managed system timed out before the RPC server replied.
RPC Client Replies Not Matching Calls	The number of times the managed system received replies from an RPC server that did not match calls.
RPC Client Times Authentication Refreshed	The number of times the managed system had to resend the authentication information for an RPC call during the monitoring interval.
RPC Client Times Call Wait On Busy	The number of times the initial bind for an RPC call from the managed system had to wait because of a busy server.
RPC Server Calls Rejected	The number of RPC calls from the managed system that were rejected by a server during a monitoring interval.
RPC Server Packets Too Short	The number of incomplete RPC packets that were too short in length received by a server during a monitoring interval.
RPC Server Packets with Malformed Header	The number of RPC packets that had malformed headers and were received by the server during a monitoring interval.
RPC Server Times RPC Packet Unavailable	The number of times a server attempted to receive a packet when none was available, during a monitoring interval.

## Table SMP CPU

*The SMP CPU Group attributes refer to multi-processor characteristics such as cross-calls, thread migrations, and system calls.*

Avg CPU Busy 1 min	The average cpu busy time over the last one minute.
Avg CPU Busy 5 min	The average cpu busy time over the last 5 minutes.
Avg CPU Busy 15 min	The average cpu busy time over the last 15 minutes.
Avg CPU Busy 60 min	The average cpu busy time over the last 60 minutes.
Avg CPU Sys 1 min	The average system CPU time over the last 1 minute.
Avg CPU Sys 5 min	The average system CPU time over the last 5 minutes.
Avg CPU Sys 15 min	The average system CPU time over the last 15 minutes.
Avg CPU Sys 60 min	The average system CPU time over the last 60 minutes.
Avg CPU Usr 1 min	The average user CPU time over the last 1 minute.
Avg CPU Usr 5 min	The average user CPU time over the last 5 minutes.
Avg CPU Usr 15 min	The average user CPU time over the last 15 minutes.
Avg CPU Usr 60 min	The average user CPU time over the last 60 minutes.
Context Switches	CPU context switches rate per second during the sampling interval.
CPU Busy	The sum of the System CPU and User CPU attributes in percent.
CPU Time	The time the CPU has been utilized.
CPU Usage	The sum of percent system CPU and user CPU time.
Cross Calls	Inter-processor cross-calls rate per second during the sampling period.
Idle CPU	Percentage of idle CPU time during the sampling period.
Interrupts	Interrupts rate per second over the sampling interval.
Interrupts As Threads	Interrupts as thread (not counting interrupts) rate per second during the sampling period.
Involuntary Context Switches	Involuntary context switches rate per second during the sampling period.
Major Faults	Major faults rate per second during the sampling period.
Minor Faults	Minor faults rate per second during the sampling period.
Spins On Mutexes	Spins on mutexes (locks not acquired on try) rate per second during the sampling period.
Spins On RW Locks	Spins on read/write locks (locks not acquired on first try) rate per second during the sampling period.
System Calls	System calls rate per second during the sampling period.
System CPU	Percent of system CPU time during the sampling period.
Thread Migrations	Thread migrations to another processor rate per second during the sampling period.
User CPU	Percent of user CPU time during the sampling period.
Wait I/O	Percent of wait I/O CPU time during the sampling period.

*Instance(s):*

*CPU ID*