IRIX Performance Metrics

The Uptime Infrastructure Monitor IRIX agent collects the following performance metrics from the systems on which it is installed:

The IRIX agent uses a number of utilities to gather these metrics including:

- `sar`: collects information about system activity.
- `ifconfig`: configures the parameters for network interfaces.
- `ps`: reports on the status of processes.
- `netstat`: reports on network status.

Each set of performance metrics is averaged between the interval at which the Uptime Infrastructure Monitor monitoring station polls the agent (e.g. every 10 minutes).

CPU

The Uptime Infrastructure Monitor agent uses the `sar` utility (with the `-u` and `-f` options) to collect the metrics listed below from an IRIX system. The statistics returned by the agent are averaged for all CPUs on the system.

Metric	Explanation
% Usr	The amount of time that the CPU spends in user mode.
% Sys	The amount of time that the kernel spends processing system calls.
% WIO	The amount of waiting time that a runable process for a device takes to perform an I/O operation.
Multi CPU Usage	Whether or not a system with multiple CPUs is effectively balancing tasks between CPUs, or if processes are being forced off CPUs in certain circumstances.
Run Queue Length	The percentage of time that one or more services or processes are waiting to be served by the CPU.
Run Queue Occupancy	The percentage of time that one or more services or processes are waiting to be served by the CPU.

Multi-CPU

The Uptime Infrastructure Monitor agent collects the metrics listed below from IRIX systems with multiple CPUs. The CPU statistics output by the agent are an average of all the CPUs on the server.

Metric	Explanation
User %	The percentage of CPU user processes that are in use.
System %	The percentage of CPU kernel processes that are in use.
Wait I/O %	The percentage of time that a process which can be run must wait for a device to perform an I/O operation.
SMTX	The number of read or write locks that a thread was not able to acquire on the first attempt, as reported by the mpstat command.
XCAL	The number of interprocess cross-calls. In a multi-processor environment, one processor sends cross-calls to another processor to get that processor to do work. Cross-calls can also be used to ensure consistency in virtual memory. Heavy file system activity such as NFS can result in a high number of cross-calls.

Interrupts	The number of CPU interrupts.
Total %	The total amount of User %, System %, and Wait I/O%.

Memory

The Uptime Infrastructure Monitor agent uses the `sar` utility with the following options to collect memory metrics from an IRIX system:

- `-w -f` (swap activity)
- `-b -f` (buffer activity)
- `-p -f` (paging activity)

The statistics the agent returns are for the entire system.

Metric	Explanation
Free Memory	The amount of physical memory available to the operating system, system library files, and applications.
Cache Hit Rate	How often the system accesses the CPU cache.
Page-outs/s	The rate at which pages were written to disk.
Page-ins/s	The rate at which pages were read from or written to the disk.
Page Frees/s	The number of pages that are freed from memory each second.
Attaches/s	The number of pages that get attached to memory each second.
Page-out Requests/s	The number of requests to perform a write operation that occur each second.
Page-in reqs/s	The number of requests to perform a read operation that occur each second.
PageScans/s	The number of pages that are scanned each second.
PageFaults/s	The number of page faults that occur each second.
Software Locks/s	The number of software locks that are issued each second.

Disk

The Uptime Infrastructure Monitor agent uses the `sar` utility with the `-d` and `-f` options to collect the disk metrics listed below from an IRIX system. The agent collects volume capacity statistics from each filesystem, while the disk statistics (%busy, Read/Write/s) returned are for each disk.

Metric	Explanation
Disk (Spindle) Name	The names of each disk on the system.
Usage (% Busy)	The percentage of time during which the disk drive is handling read or write requests.
Blocks per second	The number of read and write operations on the disk that occur each second.
Transfers/s	The average number of bytes that have been transferred to or from the disk during write or read operations.
Average Queued Requests	The number of threads that are waiting for processor time.
Average Service Time	The average amount of time, in milliseconds, that is required for a request to be carried out.
Average Wait Time	The average time, in milliseconds, that a transaction is waiting in a queue. The wait time is directly proportional to the length of the queue.

Network

The Uptime Infrastructure Monitor agent uses the following utilities to collect network data from an IRIX system:

- `ifconfig -a`
- `netstat -s`

Except for TCP retransmits, the agent averages all statistics per interface.

Metric	Explanation
Receive Rate	The rate, in kilobytes per seconds, at which data is received over a specific network adapter.
Send Rate	The rate, in kilobytes per seconds, at which data is sent over a specific network adapter.
Packets Inbound Errors	The number of inbound packets that contained errors, which preventing those packets from being delivered to a higher-layer protocol.
Packets Outbound Errors	The number of outbound packets that could not be transmitted because of errors.
Collisions	The number of signals from two separate nodes on the network that have collided.
TCP Retransmits	The number of packets that have been re-sent over a network interface.

Process

The Uptime Infrastructure Monitor agent uses the `ps` utility with the `-ef` option to collect the process data listed below from an IRIX system. By default, the agent only gathers the top 20 processes, and sorts them by the highest CPU usage.

Metric	Explanation
Number of Processes	The number of processes that are currently running on a system.
Process Creation Rate	This metric determines whether or not there are runaway processes on a system or if a forking-based process (like a Web server) is spawning too many processes over a specified period of time.
Processes Running	The number of processes that are currently running.
Processes Blocked	The number of processes that are currently being blocked from running.
Processes Waiting	The number of processes that are currently waiting to run.
Workload - User	The demand that network and local services are putting on the system, based on the IDs of the users who are logged into a system.
Workload - Group	The demand that network and local services are putting on the system, based on the IDs of the user groups that are logged into a system.
Workload - Process Name	The demand that network and local services are putting on a system, based on the processes that are running.
Workload Top 10 - User	The 10 network and local services that are are putting the most load on the system, based on the IDs of the users who are logged into a system.
Workload Top 10 - Group	The 10 network and local services that are are putting the most load on the system, based on the IDs of the user groups who are logged into a system.
Workload Top 10 - Process Name	The 10 network and local services that are are putting the most load on the system, based on the processes that are running.

User

The Uptime Infrastructure Monitor agent uses the following utilities to collect user information from an IRIX system:

- `ps -eo`
- `/usr/bsd/last /usr/bsd/head -10` (login history for the last 10 users on the system)
- `/usr/bin/who` (lists who is currently logged into the system)

Metric	Explanation
Login History	The number of times or frequency at which a user has logged into a system during any 30 minute time interval.
Sessions	The number of sessions or number of distinct users who are logged into a system during any 30 minute time interval.