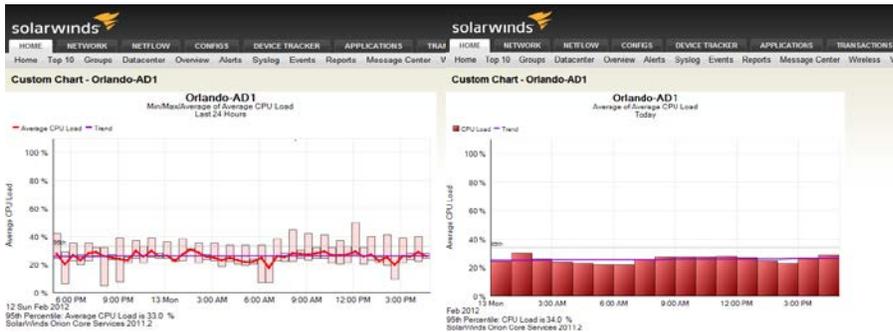


Server Monitoring

So you're on your first job as a systems or server admin and wondering what you need to monitor. The answer is: it depends. Depending on the application that the server is running, there will be mission-critical services you have to watch 24/7. Some applications will require some built-in OS services to run in addition to their services and some only require their own services. Having said that, regardless of what application the server is running, there are a set of basic components that must be monitored. Let's take a look at some of them here.

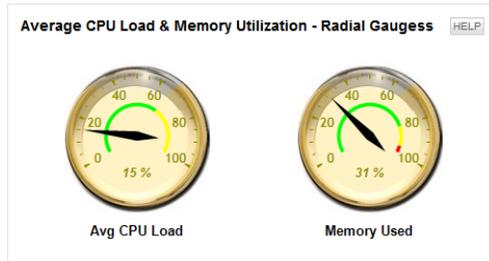
CPU

The CPU is the brains of the server hardware. The CPU, or the Central Processing Unit, is the portion of a computer system that carries out the instructions of a computer program, to perform the basic arithmetical, logical, and input/output operations of the system. A server that has its CPU pegged at 100% for several minutes, or even hours is an unhappy server. This means that it has no time (cycles) to service additional requests-whether they are mission-critical or not. Depending on what is causing the CPU spike, you have to either upgrade the CPU hardware, add more CPU's or shut down frivolous services that are hogging these critical resources. There is no one magical number percentage that the CPU usage should be below, and this is certainly dependent on your server application; but if your server CPU is always at 75% or higher usage, you should consider one of the above suggested steps.



RAM

RAM, or Random Access Memory, is a form of data storage. A server can load information required by certain applications into RAM for faster access thereby improving the overall performance of the application. The reason for this is that RAM is flash based storage and is several times faster than the slower hard disk (physical moving components). If a server runs out of RAM, it sets up a portion of the hard drive as virtual memory and this space is reserved for CPU usage.



This process is called swapping and causes performance degradation since the hard drive is much slower than RAM (think several 1000 times). Swapping also contributes to file system fragmentation which degrades overall server performance. If RAM usage is constantly rising, consider adding more RAM. Adding RAM is a cheap way to boost server performance.

Top XX Processes by Physical Memory

Top 10 Processes by Physical Memory

PROCESS NAME	APPLICATION NAME	NETWORK NODE	PHYSICAL MEMORY USED
	Internet Information Services	CORP-WEB	2 GB 84%
dns	Windows DNS Server	Support-7	544 MB 49%
	Exchange 2010 Mailbox Role Services	Tok-Exchange1	896 MB 45%
sqlservr.exe	SQL Server 2005 Database	TUL-SQLSRV-01	415 MB 39%
sqlservr.exe	SQL Server 2005 Database	OrionDevServer	582 MB 27%
store	Exchange 2007	SW-SERVER	240 MB 22%
	Exchange 2010 Mailbox Role Services	Tok-Exchange1	386 MB 19%
	Exchange 2010 Mailbox Role Services	Tok-Exchange1	317 MB 16%
	Internet Information Services	CORP-WEB	76 MB 15%
	Exchange 2010 Mailbox Role Services	Tok-Exchange2	237 MB 12%

Hard Disk

The hard disk is the device that the server uses to store data. The hard disk drive consists of several rigid rotating discs coated with magnetic material with magnetic heads arranged strategically to write data to, and read from the disc or platter. The data stored is permanent (survives a reboot unlike RAM) and non-volatile and is available till it is consciously erased by the end user. It is important to monitor the hard disk for a couple of reasons. The operating system needs space on the disk for normal operating processes including paging files and certain caches. The application running on the server also needs space to write temporary data to cache for efficient operation as well as permanent data that will be accessed by the user. Low free space on a drive is also one of the reasons for file system fragmentation which causes severe performance issues.

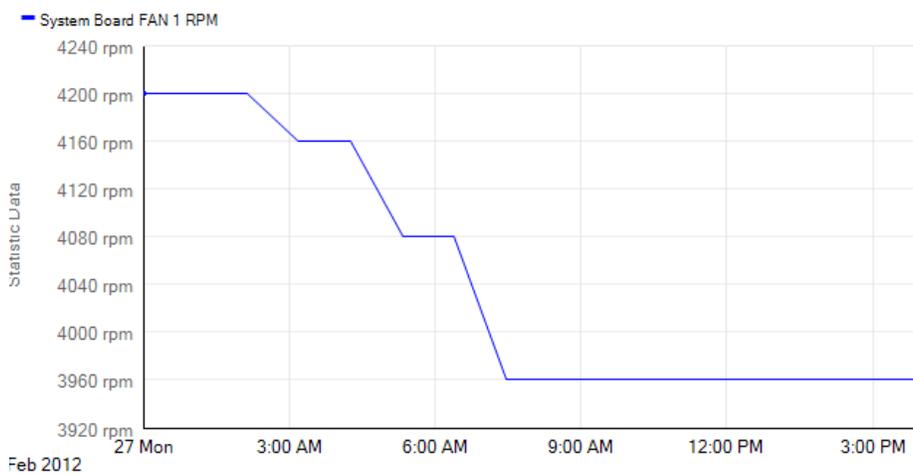
TDANNER-DEV	D:\ARMEFPP_EN 263133ae	100 %	<div style="width: 100%; height: 10px; background-color: red;"></div>
LAB-VI4.labcore.local	E:\Label:20100802 649f6804	100 %	<div style="width: 100%; height: 10px; background-color: red;"></div>
ubuntu32	Cached memory	100 %	<div style="width: 100%; height: 10px; background-color: red;"></div>
ubuntu32	Cached memory	100 %	<div style="width: 100%; height: 10px; background-color: red;"></div>
ubuntu32	Cached memory	100 %	<div style="width: 100%; height: 10px; background-color: red;"></div>

Hardware Details-Last, but certainly not the least, there are hardware components of a server that must be monitored. Let's discuss the various parameters that you must monitor on a server:

CPU Fan

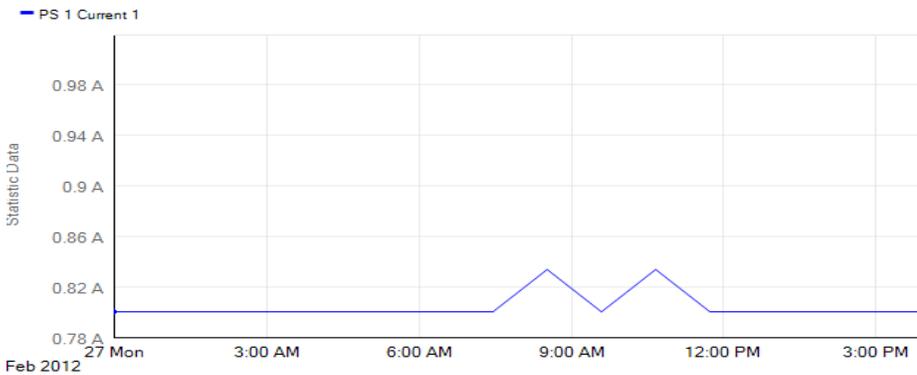
This is a fan that draws heat away from the CPU. It may draw cooler air into the case from the outside, expel warm air from inside, or move air across a heatsink to cool a particular component. If the CPU fan fails, the server will eventually overheat and fail or perform an emergency shutdown to prevent serious damage to its components-either way, your server will become unavailable. To prevent this from happening, you should monitor CPU Fan speed-monitor RPM and make sure that the fan RPM is not exceeding safe levels. Also keep an eye on historic fan RPM-if you notice a spike in fan RPM that lasts several minutes or hours, that is an indicator of a serious issue (maybe the AC is not working, the fan vents are blocked, etc).

Custom Chart - System Board FAN 1 RPM on Rio-Vm-01.lab.rio



Power Supply- A power supply unit (PSU) converts mains AC to low-voltage regulated DC power for the internal components of the computer. Modern personal computers universally use a switched-mode power supply. You need to monitor the amperage, voltage and wattage of the power supply.

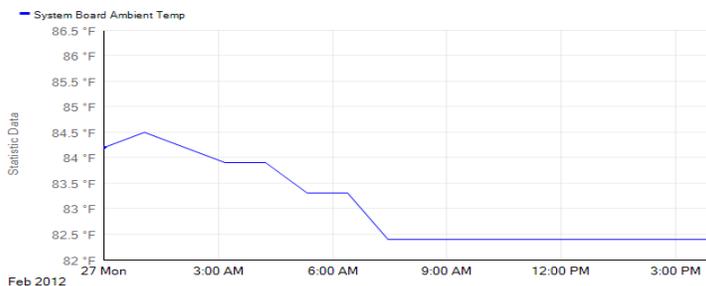
Custom Chart - PS 1 Current 1 on Rio-Vm-01.lab.rio



Temperature

The temperature of the system board or motherboard is another important component to monitor. Unusually high temperatures can cause permanent damage to the server and will affect server performance adversely. You can obtain the safe working temperature limits from the manufacturer and monitor it to make sure that it does not exceed this safe range. Also, with the addition of Virtualization to the mix, server density has increased per rack. This makes monitoring temperatures-both internal server and external environment even more critical. You can use temperature measurements to plan and deploy virtual servers where appropriate. For example, a high load web or database server should not be deployed on a physical server that is approaching temperature limits for safe operation.

Custom Chart - System Board Ambient Temp on Rio-Vm-01.lab.rio



Environmental

The temperature, air flow and humidity control of the physical space that houses your server (Data Center, closet, etc.) is another important parameter to monitor. Some of the parameters mentioned above may be a direct result of faulty A/C, improper air flow and dangerous humidity levels.

Miscellaneous

Other components that must be monitored are CMOS Battery, Disk array health, Intrusion detection and CPU hardware status.

Current Hardware Health			EDIT	HELP
SENSOR NAME	STATUS	VALUE		
+ Fan				
+ Power Supply				
- Temperature				
System Board Ambient Temp	Ok	82.4 °F		
+ Disk				
- Battery				
System Board CMOS Battery	Ok			
- Array				
PERC 6/i Integrated	Non Critical			
- Memory				
DIMM_A1	Ok	4 GB		
DIMM_A2	Ok	4 GB		
DIMM_A3	Ok	4 GB		
DIMM_A4	Ok	4 GB		
DIMM_A5	Ok	4 GB		
DIMM_A6	Ok	4 GB		
DIMM_B1	Ok	4 GB		
DIMM_B2	Ok	4 GB		
DIMM_B3	Ok	4 GB		
DIMM_B4	Ok	4 GB		
DIMM_B5	Ok	4 GB		
DIMM_B6	Ok	4 GB		
+ Intrusion				
- CPU				
Intel(R) Xeon(R) CPU E5502 @ 1.87GHz Stepping 5	Ok			
Intel(R) Xeon(R) CPU E5502 @ 1.87GHz Stepping 5	Ok			

So not only do you need a software or tool that monitors software components and services of a server, you need one that also reports on hardware details. One such product is the [Server & Application Monitor \(SAM\)](#) offered by SolarWinds. SAM will report on all mission-critical services as well as the hardware health of the server to provide you with a comprehensive 360 degree view of your total server health. You can also set up reports and alerts for capacity planning and troubleshooting. [Click here to try a free, fully-featured, 30-day evaluation.](#)