



Tech Info Library

AWS 95 Tuning: Monitor System Swapping Activity (6/94)

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TOPIC -----

This article describes the importance of obtaining information on "swapping" when tuning your Apple Workgroup Server (AWS) 95.

DISCUSSION -----

One of the most important things to learn when tuning an AWS 95 is to see if the system is "swapping". Unfortunately, the `swap(1m)` command included in A/UX only provides the current swapping activity.

First determine if swapping is actually occurring.

There is a `sysinfo` structure in the kernel (defined in `<sys/sysinfo.h>`) which contains counters updated by various kernel subsystems. Typically, these counters continue to be incremented as long as the system is running and re-set to zero each time the system is booted.

The `sysinfo` structure has several fields regarding the swap subsystem.

Field	Use
-----	---
<code>swpque</code>	Number of "swapped-out" processes "ready-to-run"
<code>swpocc</code>	Is the swap "queue" occupied?
<code>bswapin</code>	Number of pages actually swapped in (read off the swap device)
<code>bswapout</code>	Number of pages actually swapped out (written to the swap device)

If the value of these fields are all zero, no swapping has occurred on the system since it was last booted.

A quick way to look at the kernel's `sysinfo` structure is by using the `adb(1)` command in the following manner:

```
# adb -k /unix /dev/kmem
```

To display a particular field in the structure, you can use an offset as in the following `adb` input string.

sysinfo+0x38/X

The offsets of the fields described above are as follows:

Field	Offset
-----	-----
swpque	0x70
swpocc	0x74
bswapin	0x40
bswapout	0x44

In a system where no swapping has occurred, a session using the adb command to check these counters will look like this:

```
# adb -k /unix /dev/kmem
a.out file = /unix (COFF format)
core file = /dev/kmem
ready
sysinfo+0x70/X
sysinfo+0x70: 0x0
sysinfo+0x74/X
sysinfo+0x74: 0x0
sysinfo+0x40/X
sysinfo+0x40: 0x0
sysinfo+0x44/X
sysinfo+0x44: 0x0
<Control-d>
#
```

Since these counters are cumulative (if they are non-zero) swapping activity has occurred in the system. If you want to gain insight into historical activity patterns, the sar(1) command can be used with the -q and -w options to gather this kind of information.

If swapping is occurring and you want to understand the swapping characteristics better, configure and analyze the data from the System Accounting package. This will give you information on several aspects of the activities taking place in the system.

To enable the Systems Accounting Package, you need to modify the file /usr/spool/cron/crontabs/adm by removing the leading comment sign (#) from all of the lines.

To have cron(1) read the changes made to this file and schedule the processes you want executed, do the following:

```
# cd usr/spool/cron/crontabs

# vi adm (make the changes mentioned above or use TextEditor)

# su adm
```

```
% crontab < adm (If you do not do this and just type 'crontab', the
adm crontab file will be initialized, in other
words, gone)
```

After this, typing the command `crontab -l`, should return the active crontab for the adm user

```
% crontab -l
0 4 * * 1-6 /usr/lib/acct/runacct 2> /usr/adm/acct/nite/fd2log
0 2 * * 4 /usr/lib/acct/dodisk
5 * * * * /usr/lib/acct/ckpacct
15 5 1 * * /usr/lib/acct/monacct
0 * * * 0,6 /usr/lib/sa/sal
0 18-7 * * 1-5 /usr/lib/sa/sal
0 8-17 * * 1-5 /usr/lib/sa/sal 1200 3
# The following is an option to appear in the above directory
0 20 * * 1-5 /usr/lib/sa/sa2 -s 8:00 -e 18:00 -i 3600 -uybd

% exit
```

After this, you will get a report using the `sar -w` command that looks similar to this:

```
# sar -w

A/UX hostname 3.1 SVR2 mc68040 05/18/94

00:00:00 swpin/s bswin/s swpot/s bswot/s pswch/s
01:00:00 0.01 0.0 0.00 0.0 85
02:00:01 0.01 0.1 0.00 0.1 85
03:00:01 0.00 0.0 0.00 0.0 85
04:00:00 0.00 0.0 0.00 0.0 85
05:00:00 0.01 0.1 0.00 0.0 85
06:00:00 0.01 0.0 0.00 0.0 85
07:00:01 0.01 0.1 0.00 0.0 85
08:00:01 0.01 0.1 0.00 0.0 85
08:20:01 0.01 0.1 0.00 0.0 85
08:40:01 0.00 0.0 0.00 0.0 85
09:00:01 0.02 0.2 0.00 0.0 85
09:20:01 0.02 0.2 0.00 0.0 85
09:40:02 0.00 0.0 0.00 0.0 85
10:00:00 0.02 0.2 0.00 0.0 85
10:20:00 0.05 0.4 0.00 0.3 81

Average 0.01 0.1 0.00 0.0 85
```

NOTE: With the default values in the `/usr/spool/cron/crontab/adm` file, the report will get an entry every 20 minutes during the day and once an hour during the night and weekends.

We recommend reading the manual entry for `sadc(1)` and the "System Activity Package" section in the "A/UX Local System Administration" manual. You should also read the manual entry for `acct(1)`.

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