

Q: Help! My machine has slowed to molasses. Even executing **ls** in a terminal takes forever. A **ps** shows the process numbers in the PID table are in the thousands. Even soon after reboot. There are 3 defunct processes owned by root with priority of -1 which can't be killed. When trying to launch memory hungry applications on my low memory (RAM memory) machine I get "insufficient memory" errors. What can I do?

A: The key symptom of this problem is the defunct or "zombie" processes shown in the PID table. A zombie process occurs when a child process dies after its parent has died, and no **wait()** has been done for the child. Once the child process dies, it is inherited by **init** and owned by **root**. These processes are *not* consuming any system resources, except for one process table slot. They are not using memory or CPU time because they are done executing and therefore cannot be killed. When a UNIX system exhibits this type of problem (spawning lots of zombies) then some system process (often a

getty) is trying to start, is failing, and is re-trying endlessly.

Good places to look for causes of such problems are the following system files (all in **/etc**):

```
rc
rc.boot
rc.local
rc.swap
crontab
ttys
gettytab
```

Perform a checksum (using **sum**) on the suspect file on your system and compare to the checksum of the same file on your Software Release master. A difference in the

two numbers does not necessarily indicate an error. You might have intentionally changed something, but it does mean the file should be more closely scrutinized, especially if you don't think you've changed the file.

For example, the first several lines of the `/etc/ttys` file on a stock, unmodified Release 1 through Release 3 disk looks like this:

```
#
# name  getty                type                status            comments
#
# If you do not want to start the window server by default, you can
# uncomment the first entry and comment out the second.
#
# console      "/usr/etc/getty std.9600"      NeXT              on secure
console /usr/lib/NextStep/loginwindow      NeXT              on secure
```

```

window=/usr/lib/NextStep/WindowServer onoption="/usr/etc/getty std.9600"
ttya      "/usr/etc/getty std.9600"          unknown      off secure
ttyb      "/usr/etc/getty std.9600"          unknown      off secure
ttyda     "/usr/etc/getty D9600"             unknown      off
ttydb     "/usr/etc/getty D9600"             unknown      off
ttyp0     none                               network
ttyp1     none                               network

```

The man page for **ttys** explains that the flag **on** and **off** in the fourth column specify whether **init** should execute the command given in the second field. It's an error to specify **on** if the second field contains **none**. The **secure** further qualifies an **on** to allow root to login to this line. (See more about the ^asecure^o flag below.)

Specifying **on** so that someone may log in over the network tty line causes the performance degradation described above. The network entries should *never* specify

on. In other words, an **/etc/ttys** file which contains the following entries is an *error*:

ttyp0	none	network	on	secure
ttyp1	none	network	on	secure
ttyp2	none	network	on	secure

If this is the case, either change the **on** entry to **off** and reboot, or restore the file from a Release disk and reboot. As an alternative to rebooting, after modifying the **ttys** file, you can type in a Terminal as root:

```
rhino-22# kill -HUP 1
```

This tells the **init** process to reread the **ttys** file.

Warning: specifying **off** and **secure** on `ttyp0` (for example) is permissible but not advisable. This would allow users to **rlogin** or **telnet** as root to the machine on pseudo port 0 and can present a security risk. See Chapter 16, *Security*, in the Release 2 *NeXT Network and System Administration* or Chapter 14, *Security*, in the Release 3 *NeXTSTEP Network and System Administration* manual for more information on security in general.

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