

**StorageTek SL500**

Third Party Licenses and Notices

**E39382-03**

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StorageTek SL500, Third Party Licenses and Notices

E39382-03

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 *
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@@ HISTORY file:

THIS IS THE HISTORY OF THE HWCLOCK PROGRAM

02.05.17 BJH Versoin 2.16

Add error messages to explain the failure when the hardware clock is not advancing. Change timeout on busywait method of rtc tick detection to a time instead of a million iterations.

02.01.22 BJH Version 2.15

Credibility check on drift is 5 minutes per day or 30 minutes total instead of just 30 minutes total.

User can have any zero year he wants for his hardware clock. --epoch option specifies explicitly; adjtime file remembers. (--epoch formerly just affected --setepoch). Kernel epoch value no longer affects anythings (except --getepoch). --arc makes zero year assumed to be 1952.

01.08.18 BJH Version 2.14

Works on PCI (newer) sparcs.

01.05.05 BJH Version 2.13

Add --fast option.

Add --rtc option.

Use /dev/misc/rtc instead of /dev/rtc if it exists.

Validate that /dev/rtc, etc. is a character device special file.

Don't select direct ISA clock access method if not superuser.

Improve error and debugging messages concerning the search for a clock access method.

00.04.21 BJH Version 2.12

Put detailed explanation of failure of open(/dev/rtc) in --debug output.

Fix bug in the 2 second timeout from Version 2.11.

00.02.15 BJH Version 2.11

Put 2 second timeout on wait for clock tick via /dev/rtc. Some rtc drivers on some machines accept the "enable interrupt" ioctl, but aren't actually capable of delivering the interrupt, so this stops Hwclock from just hanging. When it times out, it reverts to a busywait for the clock tick.

## 00.12.02 BJH Version 2.10

Add fractional part of last adjustment time to adjtime file to improve accuracy. Thanks to James P Rutledge <jimrutledge@earthlink.net>.

Fix compilation bug on Sparc (don't #include asm/io.h).

Use tm\_isdst instead of 'daylight' to determine if it's DST for --show. In glibc 2, 'daylight' tells only if DST exists; not if it is in effect.

## 00.05.29 BJH Version 2.9

Record System Time changes in utmp, wtmp.

## 00.05.22 BJH Version 2.8

Account for Hardware Clock setting 500 ms retroactively, which made hwclock always set the clock 500 ms fast. Also verify that the clock got set to the expected value.

Add --correct option.

Tell in man page how to interpret --show output.

Put correct program name in NAME section of man page.

Tell in README file about bug in Red Hat 6.0 that keeps distributed binary from working.

Tell in man page where to get adjtimex, date, and tzset.

Include version in all debug output.

Add local time zone name to --show output.

## 99.05.03 BJH Version 2.7

In --hctosys, account for uncorrected (accumulated) drift.

Move tzset() so the possible slow reading of files it does does not impact timing.

Correct check for improbably large drift so it checks the absolute value of the drift. Thanks a0112@rgfn.epcc.edu (James P. Rutledge).

Some debug output in days instead of seconds. Thanks a0112@rgfn.epcc.edu (James P. Rutledge).

## 99.04.09 BJH Version 2.6

Fix compilation errors with some compilers and kernel and libc interface headers. Make it work with glibc 2.

Work with KDHWCLK interface even if not compiled with kernel headers that say it's in the kernel. (As long as it's actually in the kernel at runtime!).

## 99.04.08 BJH Version 2.5

Make it work on Alphas without /dev/rtc. Thanks to David Mosberger <davidm@azstarnet.com>, Jay Estabrook <jestabro@amt.tay1.dec.com>, Martin Ostermann <ost@coments.rwth-aachen.de>, Andries Brouwer <aeb@cwi.nl>. Most of this code is lifted from another program called "clock" (not the original ancestor of hwclock) that has circulated for use on Alpha.

Make it work on Sparc.

Add --badyear option. Thanks to David J Coffin (dcoffin@shore.net) for the design of this.

Add --localtime option, local/UTC value in adjtime file, and defaults for local/utc.

Don't set CMOS memory Byte 50 (century byte). On some machines, that byte not only isn't used as a century byte, but it is used for something else.

Don't update the drift factor if the variation is so huge that it probably wasn't due to drift.

Compute drift factor with better precision.

98.08.12 BJH Version 2.4

Don't use century byte from Hardware Clock. Add comments telling why.

98.06.20 BJH Version 2.3.

Make --hctosys set the kernel timezone from TZ environment variable and/or /usr/lib/zoneinfo. From Klaus Ripke (klaus@ripke.com).

98.03.05 BJH. Version 2.2.

Add --getepoch and --setepoch.

Fix some word length things so it works on Alpha.

Make it work when /dev/rtc doesn't have the interrupt functions. In this case, busywait for the top of a second instead of blocking and waiting for the update complete interrupt.

Fix a bunch of bugs too numerous to mention.

97.06.01: BJH. Version 2.1. Read and write the century byte (Byte 50) of the ISA Hardware Clock when using direct ISA I/O. Problem discovered by job (jei@iclnl.icl.nl).

Use the rtc clock access method in preference to the KDGHWCLK method. Problem discovered by Andreas Schwab <schwab@LS5.informatik.uni-dortmund.de>.

November 1996: Version 2.0.1. Modifications by Nicolai Langfeldt (janl@math.uio.no) to make it compile on linux 1.2 machines as well as more recent versions of the kernel. Introduced the NO\_CLOCK access method and wrote feature test code to detect absence of rtc headers.

Bryan Henderson based hwclock on the program "clock", in September 1996. While remaining mostly backward compatible with clock, hwclock added the following:

- You can set the hardware clock without also modifying the Linux system clock.
- You can read and set the clock with finer than 1 second precision.
- When you set the clock, hwclock automatically refigures the drift rate, based on how far off the clock was before you set it. (This is the drift rate that is used with the --adjust function to automatically adjust the clock periodically to compensate for drift).
- More mnemonic GNU-style command line options.
- Comments describing how the clock and program work to improve maintainability.
- Removed the old dead I/O code that worked without the inb/outb instructions and without the asm/io.h definitions.

The first version of hwclock was Version 2.

Here is the history section from the "clock" program at the time it was used as a basis for hwclock:

V1.0

V1.0 by Charles Hedrick, hedrick@cs.rutgers.edu, April 1992.

\*\*\*\*\*

V1.1

Modified for clock adjustments - Rob Hooft, hooft@chem.ruu.nl, Nov 1992  
Also moved error messages to stderr. The program now uses getopt.  
Changed some exit codes. Made 'gcc 2.3 -Wall' happy.

\*\*\*\*\*

V1.2

Applied patches by Harald Koenig (koenig@nova.tat.physik.uni-tuebingen.de)  
Patched and indented by Rob Hooft (hooft@EMBL-Heidelberg.DE)

A free quote from a MAIL-message (with spelling corrections):

"I found the explanation and solution for the CMOS reading 0xff problem in the 0.99pl13c (ALPHA) kernel: the RTC goes offline for a small amount of time for updating. Solution is included in the kernel source (linux/kernel/time.c)."

"I modified clock.c to fix this problem and added an option (now default, look for USE\_INLINE\_ASM\_IO) that I/O instructions are used as inline code and not via /dev/port (still possible via #undef ...)."

With the new code, which is partially taken from the kernel sources, the CMOS clock handling looks much more "official".  
Thanks Harald (and Torsten for the kernel code)!

\*\*\*\*\*

V1.3

Canges from alan@spri.levels.unisa.edu.au (Alan Modra):

- a) Fix a few typos in comments and remove reference to making clock -u a cron job. The kernel adjusts cmos time every 11 minutes - see kernel/sched.c and kernel/time.c set\_rtc\_mmss(). This means we should really have a cron job updating /etc/adjtime every 11 mins (set last\_time to the current time and not\_adjusted to ???).
- b) Swapped arguments of outb() to agree with asm/io.h macro of the same name. Use outb() from asm/io.h as it's slightly better.
- c) Changed CMOS\_READ and CMOS\_WRITE to inline functions. Inserted cli()..sti() pairs in appropriate places to prevent possible errors, and changed ioperm() call to iopl() to allow cli.
- d) Moved some variables around to localise them a bit.
- e) Fixed bug with clock -ua or clock -us that cleared environment variable TZ. This fix also cured the annoying display of bogus day of week on a number of machines. (Use mktime(), ctime() rather than asctime() )
- f) Use settimeofday() rather than stime(). This one is important as it sets the kernel's timezone offset, which is returned by gettimeofday(), and used for display of MSDOS and OS2 file times.
- g) faith@cs.unc.edu added -D flag for debugging

V1.4: alan@SPRI.Levels.UniSA.Edu.Au (Alan Modra)

Wed Feb 8 12:29:08 1995, fix for years > 2000.

faith@cs.unc.edu added -v option to print version. \*/

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TinyLogin is a curious blend of code from a whole bunch of folks. It was originally cobbled together by Sean Bastille <hightide@ginch.org> based in part on the May of 1998 version of the shadow utilities, which can be downloaded from: <ftp://ftp.ists.pwr.wroc.pl/pub/linux/shadow/>

The build system, and the way in which TinyLogin invokes its component applications has been totally rewritten, based on the build system used for BusyBox. The code has also been majorly reworked to make it

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Special thanks are due to Chip Rosenthal for his fine testing efforts; to Steve Simmons for his work in porting this code to BSD; and to Bill Kennedy for his contributions of LaserJet printer time and energies. Also, thanks for Dennis L. Mumaugh for the initial shadow password information and to Tony Walton (olapw@olgb1.oliv.co.uk) for the System V Release 4 changes. Effort in porting to SunOS has been contributed by Dr. Michael Newberry (miken@cs.adfa.oz.au) and Micheal J. Miller, Jr. (mke@kaber.drain.com). Effort in porting to AT&T UNIX System V Release 4 has been provided by Andrew Herbert (andrew@werple.pub.uu.oz.au). Special thanks to Marek Michalkiewicz (marekm@i17linuxb.ists.pwr.wroc.pl) for taking over the Linux port of this software.

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D: CPU Support for MPC 75x; board support for Eltec BAB750 [obsolete!]

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D: FPGA device configuration driver

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## **zlib, Jean-loup Gailly and Mark Adler**

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```

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```
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```

```
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Ty Coon, President of Vice
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```

```
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<one line to give the program's name and a brief idea of what it does.>
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```

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```
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```
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```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
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