Athena System Release 6.0B

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1. Introduction

This document describes the software changes in Athena System Release 6.0B. It contains an overview of the important changes, followed by sections describing specific differences between instances of 6.0. Changes between 6.0A and 6.0B, as well as corrections to the 6.0A notes, are marked with changebars.

2. Major User-Visible Changes

2.1. All Systems

SLIP support was added to */etc/pstat*.

/usr/ucb/yes now uses *write* rather than *printf*.

The commands */bin/athena/hostinfo* and */usr/ibm/dosread* have been added.

A new version of */usr/new/jove* is installed.

Scribe v6.0 is installed as */usr/athena/scribe6*; Scribe v5.0 remains the default for this release, and now supports accents for the Helvetica and Courier fonts. The *Scribe* database for the Xerox 9700 printer has been modified to work better without Multics.

Zephyr is now installed and is activated by default. If a user takes no action, s/he may receive messages and be located. The user's login is not announced to the world, however. Detailed notes on this Zephyr release can be found in */mit/zephyr/notes/release-notes.6.0b*.

/usr/athena/help has been updated by the Documentation Group.

The GDB library and the *whatsup* program have been installed as */usr/lib/libgdb.a* and */usr/athena/whatsup* respectively.

A much improved */usr/athena/gnuplot* function plotting package is now available. This includes both an interactive form and C bindings.

This release includes Kerberos release 2.0 throughout. Specifically, these commands have been remade with this new library:

	kdb_init	ksu	zaway	znol
discuss	kdb_util	login	zctl	zstat
ext_srvtab	kdestroy	nfsid	zinit	zwrite
inc	kinit	rcp	zleave	

```
kdb_destroy    klist         rlogin         zlocate
kdb_edit       kstash        rsh            zmailnotify
```

This does not qualify as a "Major User-Visible Change" excepting that the command
/usr/athena/list_tkts has been replaced with */usr/athena/klist*. The latter has the sense
of the *-l* flag to the old */usr/athena/list_tkts*. For compatibility, the *list_tkts* is linked to
klist, and, in addition, there is an undocumented, noop flag *-l* to *klist*.

Floppy device names are arranged such that */dev/floppy* is a symlink to the "proper"
device for that machine. Specifically, */dev/rfd0* for the RT/PC, */dev/xxx0* for the VS2000,
and */dev/xxx0* for the VS2.

/usr/ucb/talk now uses the standard 4.3 port. During the release, old machines and new
machines will not be able to *talk* to each other (#461). */usr/ucb/talk.old* will be available
for this period.

There are new user-prototype files; users will need to get the new ones. (#85)

/etc/shells now lists only */bin/sh* and */bin/csh*.

2.1.1. X11R2

This release incorporates X11R2. There are many bug fixes to X11; a complete list is not
available. Athena release 6.0B takes X11R2+, i.e. somewhat later sources than public
release 2. The X toolkit is now included as part of the standard Athena release, since it is
has reached a useful stage of development. (See */mit/x11dev/src/COVER*, for a
description of what is entailed.) Source and executable pools with varying tradeoffs of
newness and stability are kept on the *stafftools*, *x11*, and *x11dev* filesystems. (See recent
postings to *xconversion*.)

There is no change to the protocol, so applications should continue to run. However, if a
developer is attempting to relink an application, it will be necessary to recompile it before
the initial relink operation.

The contents of most .Xdefaults file have become obsolete (change of meaning of some
characters, for example). Secondly, the .Xdefaults concept is also obsolete -
/usr/bin/X11/xrdb and its associated input file, replaces it. An open question exists as to
the most transparent naming for that file, and whether the conversion script (that is
available) is a sufficient degree of support for the user.

There are some minor, additional items in Xlib.

The patch that permits X11Rβ binaries to bypass the protocol checking in the server
remains installed.

command unix:0 no longer works - rather, it is necessary to say *command -display unix:0*.
This explicitness requirement extends to geometry specifications as well, although the old
form of geometry specification will continue to work for the time being. It is possible to
enable the old form for *display* for Athena, but that only postpones the necessary and
complicates relations with parsing where filenames containing the colon character exist on
the command line. In addition, clients not based on the Toolkit will have to be individually
massaged to reenable the old form as they have no compile time options to effect this
reversal.

Drawing dashed lines should work with the X server now.

The Tektronix emulation mode of */usr/bin/X11/xterm* has had many bugs fixed. It should now be usable for most applications requiring Tektronix emulation.

The protocol converter has been installed as */usr/bin/X11/x10tox11*.

The X10 xlib has been removed from the release and is available in a separate locker.

2.1.2. emacs

emacs is now up to version 18.50.

/usr/athena/emacs has been recompiled with R2 Xlib. In addition, *emacs* mouse bindings become the same as for other Xtk applications, i.e. cut and paste operations change button bindings. This has user visibility. Again, we can rebind mouse buttons to preserve backward compatibility for *emacs*, but it means training yet another Freshman class with one set of bindings for *emacs*, and another set for all other Toolkit applications. Ctrl-spacebar sets the mark, given the use of either the R2 Xlib, or modifications to the R1 Xlib (as yet unmade). It should handle redisplaying itself much better.

The protection mode on autosave files is also correct now.

2.1.3. Enhancements to /bin/athena/attach

/bin/athena/attach and */bin/athena/detach* are now verbose by default; the *-q* flag makes them quiet.

The *-n* option does not attempt to do mount time authentication for NFS mounts, unlike the default case. With *detach*, the flag indicates making no attempt to remove authentication.

The *-z* option does not attempt to subscribe to Zephyr notification about the file server, unlike the default case. With *detach*, the flag indicates making no attempt to remove subscriptions.

attach and *detach* now accept multiple filesystems on the command line.

All directories needed to reach the mount point named by Hesiod are created. *detach* removes all of them.

An error is printed if there is an attempt to mount on a busy directory (#424).

File locking is now used on *attachtab*. In addition, this file is moved from */etc* to */usr/tmp*.

nfsid has moved from */etc/athena* to */bin/athena*, leaving a symlink behind in */etc/athena*.

2.1.4. Enhancements to csh

The following changes have been made to the C-shell:

- */bin/csh* recognizes if you are trying to run a RT binary on a VAX or vice versa.

- The shell variable "hosttype" is set to 'rt' or 'vax' as appropriate.

- Keymaps can be dynamically allocated and assigned. New builtins have been added: list_keymap, set_keymap, create_keymap, delete_keymap. The old commands, set_edit_char and set_prefix_char, have been retained for backwards

compatibility and affect the base and meta keymaps respectively.

- New editing functions were added: delete_eol, emacs_twiddle, upcase_word, downcase_word, capitalize_word, and no_op. ^K is set to delete_eol instead of delete_search, a backward incompatibility.

- The prompt string now expands various %-sequences: For example, the string "<juser@%m> {%d}\n%!% " generates a prompt like this:

<jruser@SELENE> {/mit/jruser} 137%
- The shell variable prompt2 controls the prompt printed during interactive "while" and "for" loops.

- The history list is now time stamped; the -t flag disables this.

- If the alias precmd is set, then the alias will be executed before the prompt is printed. This is useful for people who like to have cycling prompts.

- Command completion has been enhanced. During rehashing, a command table gets built for the purpose of command completion. This speeds up command completion into something that's usable.

2.1.5. OLC

A new version of OLC is installed. Client (olc and olcr) changes: none.

These daemon changes have been running for several months on Matisse, so the 6.0 release should not result in any visible changes for either consultants or users.

- Zephyr is now used to send messages. If a user or consultant isn't using Zephyr, the message is sent using write, as before.

- OLC now allows eight different consultants (instead of just five) before marking it as "unanswered" and taking it out of the question queue.

2.2. RT/PC

The base operating system is now the February, 1988, AOS 4.3 with NFS support. This should bring the RT and the VAXstations in line on many low-level issues, though the changes should not be user visible.

Root partition doubled in size at the expense of /site. This requires a workstation reinstall.

/usr/athena/2020 is now available. It is not exactly the same as the version on the VAXstations; a list of differences is not available at this time.

/usr/athena/saber, is now available. This is version 1.2B.

2.3. VAXstations

An erroneous setting for the g partition in /etc/disktab has been fixed.

/usr/athena/saber has been upgraded to version 1.2C. In addition, version 2.0 will be installed as /usr/athena/saber2. Version 2.0 replaces the C style command interface with the dbx style.

The IBM DOS commands are now available for use on VAXstation 2000's using 1.2Meg disks. They do not work with 360K disks; this is a hardware issue and is not fixable. An open question is whether RX50's work.

A new set of VE GKS software is available to work with X11.

VAXstations now support redirection of console output to a window using *xterm -C*. (#111)

3. Kernel Changes

The following changes have been made to the kernel:

- Van Jacobsen's *xtcp* replaces existing *tcp* service.

- Network Information Protocol support added.

- Synchronous write to NFS servers is now set by default.

- Deal with RPC_AUTHERROR as with EPERM; see */source/vax/sys.wisc/nfs/nfs_subr.c.* (for attach)

- Read access, not exec access, is now needed to read directories.

- NFS checksums have been enable for all machines; see */source/vax/sys.wisc/rpc/kudp_fastsend.c.*

- NFS write errors are now properly returned to the process. The error may be returned on the next operation on the file, however (including *close()*).

- Several dereferences of null pointers are fixed, and support for making it impossible to program that way is added.

- ^C on the console during "file system full" messages can no longer leave inodes locked.

- Vnode code no longer leaves socket pointers danglin in space.

- Delayed writes now work properly.

- The paging strategy has been modified to retain process text pages longer. (from CMU)

- Lock process from being swapped out during exec; see *kern_exec.c.* (from Sun)

- Table-driven version of ctime() to handle changes in daylight savings time installed. In the kernel, this affects */source/vax/sys.wisc/sys/kern_time.c.* (from UCB)

- ^C on console during "file system full" message could leave inodes locked; see */source/vax/sys.wisc/sys/subr_prf.c* and */source/vax/sys.wisc/sys/tty.c.* (from UCB)

3.1. VAX Kernel Fixes

The following fixes have been made in the VAX kernel:

- RD type disks now supported by boot programs.

- VAX 750 microcode changed to load microcode from TU58 if it is newer.

- Various device support improvements for the VS2000 are installed.

- MicroVAX emulation of VAX floating point instructions and *matchc* string comparison have been fixed.

- Fixed spt map for VAXstar */source/vax/sys.wisc/vax/locore.s*

- Fixed a problem with the rename system call; recording the error number if the error occurred on write (nfs_vnodeops.c)

- UCB versions of Athena fixes for fodkluster routines (vm_page.c)

- More support for VAXstar devices (conf.c)

- Halt for real, not using loop (machdep.c)

- Upgrade se driver to real Ultrix 2.0 (if_se.c)

- PLX support for maptouser(). (uba.c)

- Upgrade sm driver to release Ultrix 2.0 (sm.c)

- Upgrade sdc driver to release Ultrix 2.0 (sdc.c)

3.2. RT/PC Kernel Fixes

All new, based on ACIS 4.3 release of February, 1988.

Hand-coded assembler version of the NFS checksumming code replaces the compiled C version.

4. Manual Page Updates

Several changes have been made to the manual pages. In addition, section 3X is now observed by */usr/ucb/man*.

4.1. New Manual Pages

The following manual pages are new in this release. Most of them are brief documentation for builtin C shell commands.

environ.7	history.1	jobs.1
fg.1	alias.1	bg.1
logout.1	notify.1	rehash.1
source.1	hostinfo.1	xversion.n

4.2. Updated Manual Pages

The following manual pages have been updated.

printers.7	csh.1	newsyslog.8
prochart.1	sh.1	ls.1
x*.n	sticky.8	chmod.2
macsyma.1	top.1	

4.3. SMS Manual Pages

The following manual pages for the Service Management System (SMS) have been installed or updated.

```
chfn.1              clustermaint.8      mailmaint.1
smscheck.8          dcmmaint.8          nfsmaint.8
smstest.8           attachmaint.1       chsh.1
listmaint.1         rvdmaint.8          usermaint.8
```

4.4. Deleted Manual Pages

The following manual pages have been deleted.

```
chhome.1            madm.1              gadm.1
ruptime.1
```

The following manual pages have been moved to the *watchmaker* locker.

```
berkbug.1   disk.1        install_pmd.1  rclock.1     today.1
bm.1        dtree.1       kuang.1        remind.1     undel.1
bpatch.1    fd.1          less.1         rgrep.1      unhide.1
cchk.1      findperm.1    mpw.1          shar.1       utf.1
cdecl.1     forth.1       ofiles.1       showfont.1   xecute.1
checkmail.1 ftu.1         pmd_stats.1    stat.1       xtools.1
cpg.1       gothic.1      pmdc.1         stuff.1
del.1       hide.1        prf.1          sun.1
```

5. Bug Fixes

All of the official bug fixes to 4.3 distributed by Berkeley have been incorporated. They are included in the list below, but not marked. The number in parentheses after an entry indicates the number of the bug in the *buglist* notesfile on priam, or the *changes* notesfile on paris.

Bug fixes include:

- Fixed a checksum problem in */etc/ping*.

- Fixed a problem in */usr/ucb/rexec* where rexec(3) incorrectly used a short to hold a u_short port number. When the machine has been running long enough, this causes a wraparound error, and connection attempts fail.

- */usr/bin/lint* now handles ENUM's correctly.

- Bug fixes to the VAX *libc* were made.

- A bug fix to *isatty* was made.

- Corrected a problem in */source/vax/lib/libc/gen/getwd.c* which attempted to reference a freed pointer.

- Corrected a problem in which */usr/etc/ac* would merge output fields if a user was logged on >100 hours. (net)

- Corrected a problem in */source/4.3/usr.bin/deroff/deroff.c* by changing the variable "const" to "Const", avoiding conflict with the reserved word "const".

- Corrected a problem in */usr/ucb/lastcomm* by adding dysize(year) routine */source/4.3/usr.ucb/lastcomm.c* to permit calculating the size of the year (in days) correctly.

- Corrected a problem in */usr/ucb/vacation* in "From" line handling. (net)

- Corrected a problem in */usr/ucb/vgrind* by changing "index" to "vindex" in */source/4.3/ucb/vgrind/vfontedpr.c* so that it doesn't clash with "index()".

- Null pointer dereferencing bugs removed from */usr/ucb/Mail*, specifically from */source/4.3/ucb/Mail/{optim,head.c}*. (net/ELXSI)

- Various bug fixes to */etc/named* were made. Specific to */source/4.3/etc/named/ns_main.c*, success and failure files for database parsing were added, and a fix to prevent blocking on opening */dev/tty* was made. Specific to */source/4.3/etc/named/db_load.c*, *named* now skips lines with empty fields, i.e. doesn't punt the file, and records parse errors in FailFile, setting error_occurred.

- A series of bug fixes to RVD were made.

- The HASHPW variable in */etc/rc.conf* has been removed. (#117)

- Corrected a problem in */bin/passwd*; the program now rewinds the shells file before checking it. Also, the *dbm* warnings have been supressed.

- Corrected a problem in */bin/su*. Specifically, the assignment of "mytty" was moved within */source/4.3/bin/su.c*. Previously, when the "su'er" was root, mytty was not getting assigned (a definite problem).

- Corrected two problems in */etc/athena/gettime*; one fix being so that a connection refused doesn't result in a time in the 21st century; another being so that it actually finds dcn1.arpa. Also, an *ifdef* for *pcc* on RT/PC was added.

- */usr/bin/X/xswitch* now prints a warning about some features not available under X10 (e.g., Zephyr). In addition, */usr/bin/X/xswitch* now ensures that individual is logged in on the display. (#146)

- */bin/login* was occasionally permitting local logins without a passwd. It now observes them. (#129)

- */etc/mount* no longer trusts */etc/mtab*, but uses kernel instead.

- */bin/df -i* is now trapped for NFS mount points. (#119).

- The */usr/new/lib/X/uwm* directory was needed by */usr/bin/X10/uwm*; it is no longer necessary.

- The X *lint*-libraries are now available. (#114)

- */usr/ucb/indent* now permits Apollo-style "$" identifiers to work as "_" otherwise would; see */source/4.3/ucb/indent/lexi.c*. (#162)

- */usr/lib/ms* was empty, now is included.

- */usr/ucb/make* now allows 400 MAXARGS. (#165)

- A new and improved version of */usr/bin/X/xdpr* replaces the one with the crumpled horn that tossed the user all tattered & torn.

- The resetting problem between LN03's and LN03+'s with respect to

/usr/bin/X/xpr has been fixed.

- */usr/bin/X/emacs*, */bin/cp*, and */bin/mv* have been modified to check for write errors more carefully, in conjunction with the kernel change described above.

- Sizing */usr/bin/X/xclock* to its minimum size will no longer crash the X server.

- The Penplot library has been rebuilt with X11R2.

- Many bug fixes have been made for the SMS utilities.

- */bin/login* now includes a hook for a message-of-the-day service. (That service is under development by Project Athena Operations).

- */bin/telnet* now maps CRLF properly. (#457)

- */usr/ucb/finger* could report inaccurate login times for similar user names; this has been fixed. (#423) (#129)

- */usr/pub* has been restored (#422).

- Berkeley official fixes were made to
    - */etc/getty* (security fix to /source/4.3/etc/getty/main.c), */etc/rlogind* (security fix to /source/4.3/etc/rlogind.c), */etc/rshd* (security fix to /source/4.3/rshd/rshd.c), */etc/telnetd* (CRLF mapping fix to /source/4.3/ucb/telnet/telnet.c), *uucp* (window size fix to improve throughput in */source/4.3/usr.bin/uucp/pk.h*), *bad144* (patch #29 to */source/vax/etc/bad144/bad144.c*, moving a return test down six lines), *getenv* (adding an internal lookup function to */source/vax/lib/libc/gen/getenv.c* as part of introducing the new function *setenv*) and *setenv* (correct the direction of a single *strlen* comparison in */source/vax/lib/libc/gen/setenv.c*).

- */etc/athena/newsyslog* now covers more system logs (#415), does so as a C program rather than a script, and operates under the control of a configuration file, *newsyslog.conf* (#110).

- Some additional support for system logs was also added to */etc/cron*. The latter was *lint*'d as well.

- */usr/bin/ranlib* is now careful about handling clock skew across NFS; the previous hack to handle this in */bin/ld* has been left in for this release, but will be removed a future time.

- */bin/passwd.real* now changes shells properly (#452).

- */etc/ftpd* now logs correctly in debugging mode (#444), and its parser now handles renames of non-existent files properly (#443).

- In */usr/bin/egrep*, a '.' no longer matches a newline (#442).

- Under certain circumstances, *abort()* could return to a program without halting it. This has been fixed (#437).

- There is a *lint* library for *libcom_err.a* (#435).

- */bin/sh* builtins no longer inadvertently test the background process status.

- */bin/chgrp* through NFS now works. It does, however, require that the server kernels be updated as well.

- The maximum number of groups for a user has been increased to 32.

- The C compiler now handles most "schain botched" errors properly [VAX only].

- /etc/athena/deactivate now flushes NFS uid mappings as its first order of business. (#425)

- /etc/athena/clean_tmp_areas is now careful not to remove devices or sockets. It also does not cross filesystems.

6. Other Changes

Case-insensitive string comparison functions have been added to the C library. See the manual page on strcasecmp() for details. This is now a Berkely supported function.

/etc/disktab and /etc/termcap have support for IBM devices. In addition, /etc/termcap |
has the latest VT100 entry from UEG.

hesinfo has moved to /bin/athena from /usr/athena so it is available on the root filesystem. A symbolic link remains for now in /usr/athena, but it will be removed in a later release.

/etc/dump has a new option, -S, to use an alternative superblock (#460).

If available, /etc/group.local is used to replace /etc/group at deactivate time.

Client support for RFS has been removed.

Support for MDQS, RFS, and userinfod has been removed from /etc/rc.

A table-driven version of ctime() to handle changes in daylight savings time has been installed. All affected utilites for which we have source have been recompiled.

```
date(1)          tzone(8)          lock(1)          sendmail(8)
```

include files

```
time.h           tzfile.h
```

and kernel source

```
kern_time.c
```

/usr/athena/ptroff now explicitly specifies its font path.

/etc/inetd.conf now provides time and daytime services for both TCP and UDP.

/etc/athena/atimeserver has been removed; /etc/inetd now provides the service.

The script claiming that /usr/unsupported/assist was being phased out has been deleted.

The scripts claiming that madm and gadm were being phased out have been deleted.

The script claiming that xwm was not available under X11 has been deleted.

Changes to /usr/athena/tarmail/atob.c and to /usr/athena/tarmail/btoa.c to make |
them work and be outside world compatible.

/usr/ucb/more now starts the $EDITOR editor on user entry of "e", the $VISUAL editor on entry of "v".

Changed the *troff* processor in */usr/ucb/man* from *vtroff* to *psroff*.

Added */usr/etc* to the search path of */usr/ucb/whereis*.

Additional modem support added to *aculib*.

/usr/athena/psgrind, an analog of */usr/ucb/vgrind* has been added, and the man page for the latter edited to serve double duty.

Games are no longer built in the standard release. See the *games* file system instead.

The SMS programs */usr/etc/attachmaint*, */usr/etc/portmaint*, and */usr/etc/clustermaint* have been added to the standard system, and */usr/etc/listmaint* has been upgraded.

A new version of *top* from Rice University installed.

IBM 3812 PagePrinter support now exists in (/usr/lib).

The NFS server control program */etc/nfsc* has been introduced.

A server management tool, */usr/etc/setquota* has been introduced.

A script indicating the obsolescence of */usr/athena/in* and */usr/athena/out* has been introduced.

The *-P path* and *-x* flags added to */usr/ucb/rdist*.

Hesiod support added to *nstest* and various *libc* functions, especially *resolve*.

/etc/athena/track was extensively rewritten for durability and functionality.

/etc/athena/toehold was modified to support new varieties of X server, *Xibm* and *Xqdss*, and further modified to add an XIOError Handler so that a server restart is detectable. (This is intended to cure the so called "art-deco" bug.) Finally, move the pid file to */usr/tmp* so that it stays around through deactivate cycles.

Portability fixes so VAX and RT can use common code have been made to the source to these commands.

awk (1)	expr (1)	ls (1)	make (1)
mt (1)	od (1)	sed (1)	sh (1)
badsect (8)	inetd (8)	newfs (8)	restore (8)
rlogind (8c)	ex (1)	gcore (1)	egrep (1)
lex (1)	struct (1)	prolog (1)	

and to these header files.

```
rpc/auth_unix.h rpc/types.h
```

Changes (to support new hardware and the ACIS 4.3 base release on the RT/PC) have been made to */bin/athena/machtype*.

Increased *Makefile* dependency generation support for developers was added. (See manual

page for */usr/athena/makedepend*).

The Access Control List (ACL) library is now available for developers in */usr/athena/lib/libacl.a*.

The SS user interface library is now available for developers in */usr/athena/lib/libss.a*.

The Error Table (ET) library is now available for developers in */usr/athena/lib/libcomm_err.a*.

A single message has been placed in */usr/msgs* indicating that the */usr/ucb/msgs* command is obsolete. This permits other uses should that become useful.

/usr/clu is now a symlink to */mit/clu* consistent with serving CLU from a remote filesystem.

/etc/inetd is now arranged to bring the workstation up in *access_off* mode, but provides the *-n* flag to override. It is therefore no longer appropriate to include a *kill -1* of *inetd* in an *activate* script as that will merely cause *inetd* to restart - not to change over to access_on. Inclusion of an *access_on* in */etc/athena/deactivate.local* provides the desired effect. Note that this does not insure absolutely that a workstation will be accessible remotely after a reboot sequence. Should the workstation be unable to complete the first activate / deactivate cycle, it will remain unavailable.

If the workstation is public, then a new */usr/lib/sendmail.cf* file will be reinstalled from */srvd* at every boot. (Reinstall includes running */usr/lib/sendmail -bz* to create the *sendmail.fc* file.)

The timezone stuff in */etc/zoneinfo* was reconfigured such that only the necessary parts remain on the root filesys, the rest being symlinks to the */srvd/etc/zoneinfo*. (#145)