



**PROJECT ATHENA
SYSTEM RELEASE NOTES**

Athena System Release 7.4
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1 Introduction

This document describes the software changes in Athena System Release 7.4. It contains an overview of the important changes, and detail on changes in the release as a whole. Many thanks to Richard Basch, Bill Cattey, Andy Oakland, Mark Rosenstein, and Chris VanHaren (among others) for their contributions to this document.

Changes between earlier 7.4 release notes and this version are denoted with changebars.

[Changebars will not be used until after the first non-DRAFT set of release notes is published.]

2 Major User-Visible Changes

2.1 Supported Architectures

Release 7.4 supports the following architectures:

```
VAX BSD 4.3
RT AOS 4.3
DECstation Ultrix 4.2A (updated from Ultrix 4.2)
IBM RS/6000 AIX 3.1
```

2.2 User Environment

Major user visible changes that will likely affect users:

- The *add* command can now be used in your */.environment* file. It also now has an optional “-v” argument to be verbose about what it is doing.
- The default behavior of *quota* has been changed so that it is likely to only report on filesystems the user cares about. It also supports new options a and f. See the section on *quota* later in this document.
- *EZ* now has a motif-style menubar across the top of the window. Format notes will be visibly different on screen. See the section on *EZ* later in this document.
- *twm* on machines with grayscale monitors, no longer uses the “Color” keyword specification for selecting color options. Instead the “Grayscale” option will be honored. This is a new feature and is not compatible with older versions of *twm*.

2.3 Files Moved to Lockers

The following have been moved to lockers to allow either updates outside of the release cycle or to indicate a lowering of support.

- *mkserv* - *mkserv* has been moved to the *mkserv* locker. This will allow new services to be introduced outside of the release cycle. As of this date the following services have been added or modified:
 - *remote* has been modified to handle the NOREMOTE functionality of *login*.

- modem has been written for configuring the serial lines for use in dialin applications. This is currently supported on DECstations, and VAXstation 3100's. If more platforms are required, they will be added as the configuration is determined.
- kermi - This is now in the *modem* locker. Other software useful while dialed up will also be placed here along with hints from end users as they are learned.

2.4 DECstation Ultrix 4.2A

All DECstations will be updated to a newer version of the Ultrix operating system.

- New hardware - Support has been added in this release for DECstation 5000/133 systems and the DECstation 5000/25 (Maxine).
- X server - Several speed improvements have been made to the X server for the 5000/120 series of machines.
- *man* has been fixed on the DECstation to search all suffixes as the Ultrix *man* pages have, allow multiletter suffixes, and uses *tbl* instead of *eqn*. This had caused several manpages to be misformatted in the last release. */usr/athena/etc/catman* also had the same change made.
- */etc/athena/rc.athena* has had the following changes made:
 - If */usr/vicel/cache* is on a partition to itself, the parameters that adjust the cachesize have been tuned to make better use of the entire partition.
 - If SAVECORE is not set to true in */etc/athena/rc.conf*, then errorlogs of panics will properly be logged.
- */etc/elcsd* has been modified to log both to local disk and to remote central logging. Before it would log in one place or the other and not both.
- */etc/syslog* has been replaced by John Kohl's version of syslog which is compatible with the old 4.2 syslog conventions but adds the 4.3 features of message forwarding and Athena's additions of Zephyr delivery. The configuration file is in */etc/nsyslog.conf*. To handle old logging, the *compat* keyword describes the facility code.
- *whois* now works. It had the wrong host hard coded in the binary.
- Provisions for additional swap configuration on different disk partitions for private machines have been made. It is anticipated that a *mkserve* option will allow the owner of a machine to configure the machine for additional swap without having to ask for a special kernel to be built.

The following new subsets have been loaded.

UDTACCT425	Accounting Software UPGRADE
UDTBASE425	Base System UPGRADE
UDTBIN425	Kernel Config Files UPGRADE
UDTCOMM425	Communications Util. UPGRADE
UDTEXER425	Sys Exerciser Package UPGRADE
UDTINET425	TCP/IP Networking Util UPGRADE
UDTMAN425	Ref Pages Admin/Users UPGRADE

UDTMANPGMR425	Ref Pages for Prog UPGRADE
UDTNFS425	Network File Sys Util UPGRADE
UDTPGMR425	Software Dev. Utilities UPGRADE
UDWFONT15425	X11/DECwindows 100dpi Fonts
UDWMAN425	UWS Runtime Reference Pages UPGRADE
UDWSER425	B&W, Color, or PX Server
UDWX11425	X11/DECwindows User Env. UPGRADE

2.5 IBM RS/6000 AIX 3.1

Athenized console and remote logins are now supported. Previously, one could only login with a local account.

2.6 Xlogin

A number of minor enhancements have been made to *xlogin* for this release.

- The “Login Options” and “Other Options” menus now display the keyboard accelerators for each item in the menu.
- Colors can now be specified for workstations with color display heads. The resource file can specify different colors for monochrome, grayscale, and color heads by specifying a comma separated list of colors. On color Athena workstations, the logos will be in red so that you can easily recognize a color workstation before you login.
- On multi-headed displays, all of the screens will be blanked while *xlogin* is idle. This behavior can be modified with the *-blankall* and *-noblackall* options.
- Private workstation owners can configure *xlogin* to automatically fill in their username. They will then only have to hit RETURN and then type their password. Someone else logging in has to backspace over the name (or type control-U). The owner’s name is set by putting the line “*loginName: *yourname*” in the file */etc/athena/login/Xlogin.local*.
- The mouse will now be placed a little to the left of the center of the screen on login (location 300,300). This places it inside you xterm in the default setup so that you still have some control of the workstation in the unlikely event that the mouse is broken.
- Messages can be displayed on the idle screen while no one is logged in. This can be disabled with the *showMotd* resource. The message is read from a file in AFS so that we can change it to update important operational messages. It is also possible to specify a second file to display a local messages here as well.
- A couple of potential security holes have been patched.

3 Kernel Changes

A new version of AFS has been incorporated into the kernels. For a complete description of the changes, see the description about AFS changes later in this document.

The following changes affect only the VAX and RT kernels, unless otherwise noted. On the other operating systems, the kernel is not built entirely from source; rather, it is modified where necessary and extensions are added to allow the use of AFS.

- `sys/vaxuba/sm.c`: Increase the timeout wait to prevent common “timeout polling for end of frame interrupt” warning (change from Ultrix engineering).
- `sys/ufs/ufs_vnodeops.c`: Fix for “panic: irele” when a user was at the hard quota limit and tried to rename a file increasing the size of the directory. [changes.74 #1654]
- `sys/h/param.h`: Raise MAXUPRC to increase maximum number of processes allowed a user from 40 to 64 (Vax and RT).
- `Ultrix-4.2/sys/conf/mips/{ATHMAX, ATHMAX.5000, ATHMAX.5400, PARIS}`: Raise maxuprc to increase maximum number of processed allowed a user from 50 to 64.
- `vaxscsi/{scsi_5380.c, scsi.c, scsi_data.c, scsireg.h, scsivar.h}` and `h.vax_bsd43/mtio.h`: Support for disks larger than 1Gb

4 Manual Page Updates

The following manual pages have been added to the release:

```
X.1
XConsortium.1
XStandards.1
a2p.1
h2ph.1
perl.1
s2p.1
sendbug.1
sis.1
xtechinfo.1
canonicalize_hostname.3
format_filesys_type.3
fx_acl_add.3
fx_acl_del.3
fx_acl_list.3
fx_acl_list_destroy.3
fx_close.3
fx_copy.3
fx_create.3
fx_delete.3
fx_list.3
fx_list_destroy.3
fx_move.3
fx_open.3
fxcl.3
mr_access.3
mr_auth.3
mr_connect.3
mr_disconnect.3
```

mr_do_update.3
mr_host.3
mr_motd.3
mr_noop.3
mr_query.3
mr_set_alternate_input.3
paper_copy.3
parse_filesys_type.3
sq_create.3
sq_destroy.3
sq_empty.3
sq_get_data.3
sq_remove_data.3
sq_save_args.3
sq_save_data.3
sq_save_unique_data.3
sq_save_unique_string.3
strsave.3
strtrim.3
ftpd.8c (athena)
xdm.8

The following manual pages have been updated in this release:

add.1
detach.1
enscript.1
machtype.1
mrcheck.1
quota.1
saber.1
session_gate.1
xdsc.1
xsaber.1
zwgc.1
stat.2
cron.8
timed.8
timedc.8
xlogin.8

The following manual pages have been removed from the release to lockers along with the programs they document:

kermit.1

The following obsolete manual pages have been removed from the release:

datapros.1
scheme.1

5 Bug Fixes

The following is a list of the topics in the bug database that have been marked resolved. As is usual, some problems were found to have been resolved in a previous release, and some other problems have been resolved as Athena development is not responsible for the software.

[changes.74#81] *Inode count doesn't get updated in quota information*

This 6.1C bug was fixed several releases ago in one of the many changes to the kernel relating to quota.

[changes.74#184] *sendbug requires MH*

Sendbug used to want to create the default MH path for you; it now does not try to.

[changes.74#246] *Mail loss sometimes occurs when inc'ing while over quota*

[changes.74#860] *attach changes for AIX 1.2*

The kerberos ticket length is now sent in network byte order, not host byte order.

[changes.74#1040] *find -depth does not work properly*

[changes.74#1249] *from: not installed*

Installed in 7.3

[changes.74#1607] *RS6000 rc.athena: missing "umask 022"*

[changes.74#1608] *rt 7.3 mkserv does not copy rshd*

[changes.74#1609] *DS3100 'xmodmap -pk' unaligned access*

XKeysymToString would fail with an unaligned access if the keysymbol had the high bit set.

[changes.74#1612] *edsc spins on RS/6000*

[changes.74#1616] *7.3P quota race condition*

Quotas are now only reported for lockers that the user has attached and has write-access to. This race condition where another user's attaching of a locker during the quota command will no longer print extraneous information.

[changes.74#1622] *cview miscounts RS/6000's*

[changes.74#1625] *DS7.3P rcp fallback in ucb not bin*

[changes.74#1626] *aklog/subscriptions to other cells*

[change.74#16333] *from uses wrong realm*

[changes.74#1636] *from and zmailnotify use TOP instead of RETR*

[changes.74#1637] *RS/6000 xmh: no subfolder support*

RS/6000 xmh did not deal with subfolders due to dirent/direct conflict

[changes.74#1638] *olcr: segfault on "quit"*

[changes.74#1642] *Risc hdwr: gettime no timeout*

Volatile declaration to handle ANSI setjmp/longjmp requirements. All RISC architectures would hang on gettime if remote server was down.

[changes.74#1643] *site-init.el has wrong address*

Install problem on Vax and RT; sources correct.

[changes.74#1648] *RT X server crash*

APA16 race condition fix in displaying multiwidth fonts.

[changes.74#1649] *mail loss: inc over quota*

Inc when over quota on RS/6000 (and possibly DECstation) failed because return from fclose was not checked. We won with synchronous writes under BSD as the fix checked the fflush return. Movemail (used with RMAIL) has also been fixed in this release to test for going over quota.

[changes.74#1660] *tn3270: application keypad*

When started from a DECstation, tn3270 would not enable the application keypad in an xterm window. The bug is really in ULTRIX's curses library but a work around is used here.

[changes.74#1662] *end_session: chdir not in all Bourne shells*

Replaced undocumented "chdir" with more portable "cd".

[changes.74#1663] *BSD 4.3 make: multiple -f arguments screw up \$(MFLAGS)*

[changes.74#1665] *dsgrep missing com_err init*

[changes.74#1666] *discuss "recover" missing com_err init call*

[changes.74#1675] *xdvi on RS/6000 did not honor resources*

When started from a RS/6000 xdvi would not honor the -rv or -expert command line switches or appropriate resources.

[changes.74#1676] *mail had an improper path in the shell script*

[changes.74#1696] *kerberometer on DECstations always displayed 10*

[changes.74#1697] */bin/csh: Decmips ~username completion*

When more than two possible matches existed, it would dereference a null pointer.

[changes.74#1698] *emacsclient: RS/6000 problems*

On the RS/6000, it would try to create a socket in the users's home directory, unlike other architectures where it created it in /tmp. This would cause occasional failures. It has been moved to /tmp to be consistent with other platforms.

[changes.74#1699] */bin/csh: Decmips TERMCAP bug*

Under BSD, tset sets the window size for the tty based on the termcap entry if the window size is unknown (rows=0 and columns=0). tcsh tries to be smart and takes the size from the tty and modifies the TERMCAP variable accordingly to the proper size. This works nicely except under ultrix, where tset does not do this and leaves the window size (in the tty structure) as 0,0, but sets the TERMCAP environment variable correctly. csh then screws up the TERMCAP environment variable later. (the code is only executed on the startup of csh). The fix says if the size is 0,0 then leave the TERMCAP as it is.

[changes.74#1700] *olc: network problems*

Olc/olc would not correctly read fragmented packets, preventing communication with the server. This occurs most frequently when the OLC server is a network distant from the client.

[changes.74#1701] *olc: tell users to use "renew" instead of "kinit"*

[changes.74#1702] *olc: spelling error*

satisfactorily has two i's, not one.

[changes.74#1703] *xdsc: man page*

[testers#1923] *decnips whois: contacting wrong server*

[testers#1929] *moira.3 man pages missing*

[testers#1935] *movemail: errors with '.' in col 128*

[testers#1952] *decnips: X login trashes font path*

6 Changes for future platforms

A port of the Athena environment to SunOS concurrently with work for Release 7.4; in order to minimize integrate problems further down the road, the changes necessary to support SunOS are being merged with the main source tree as soon as they are stable. However, these changes should have no visible effect on any users or developers.

7 Other Changes

Based on user requests for consistency, the following programs will be present on all platforms (previously these were present only on the BSD platforms): `tac`, `tmail`, `rs`, `tac`, `jot`, and `lam`.

7.1 Zephyr

Several changes have been made to the zephyr client, `zwgc`.

- If the `zwgc.enableDelete` (class `EnableDelete`) boolean resource is set, `zwgc` creates a `WM_PROTOCOLS` property on all `zgrams`, with `WM_DELETE_WINDOW` as contents. The default is unset, since the behavior will change for `mwm` users if it is set.
- If `zwgc` receives a `WM_DELETE_WINDOW`, it destroys the zephyrgram as if it were clicked on.
- When a `zgram` is unmapped, it is removed from the stacking order used by `reverseStack`. It is not reinserted when the window is remapped.

7.2 Attach

- Several conditions by which `attachtab` locking might fail have been fixed.
- Some security holes relating to pathname checking have been fixed.
- `detach -lint` can now only be executed by “trusted” users.
- The proper checks for some required command-line arguments has been added.
- A bug which prevented a user from attaching multiple type `MUL` filesystems has been fixed.
- When a user attempts to detach a locked filesystem, his name is now removed from the list of users currently wanting to use that filesystem.
- `detach -a` is more intelligent about how it detaches type `MUL` filesystems so that it avoids printing “already detached”.
- Errors from `aklog` are no longer considered fatal unless we are trying to authenticate.
- The user’s Kerberos credentials are now being sent over in network byte order during a NFS map request. `rpc.mountd` has also been changed to parse the tickets assuming that network byte order is being used. Previously, large Kerberos credentials sent between machines of different byte orders could cause the server to decline authenticating the user.

7.3 Timed

- Time masters now will only server as a master when the server is synchronized via the NTP protocol. Two additional command-line options to *timed* control this behavior: `-s` and `-o`.
- Clients will no longer broadcast MASTERREQ upon startup if they are not intending to run for becoming the master time server of the network. Their previous behavior was a violation of the protocol.
- Time master candidates will not reset themselves upon the receipt of a MASTERREQ packet; because of various broken clients, it was possible that a time master may never be started.
- Various log messages about clients not responding to the time server have been reduced to an informational status, so as not to produce as many warnings on the server monitor (syslogger).
- Tracing may only be enabled on the local host; remote tracing has been disabled to prevent malicious attempts to fill up a server's disk.
- Remote querying of a master site has been added. *Timedc* now accepts optional hostnames for the *msite* command, specifying that it should query those hosts for what they believe to be the time master on their respective networks.
- *Timedc* has been improved to accept IP addresses as well as hostnames for its various commands.
- The error handling for *timedc* has been improved and it will not abort certain operations based on a single error (eg. gathering information from a list of hosts, where one host was incorrectly specified).

7.4 Quota

- *quota -f* may now be used with Hesiod-style filesystem names as well as mountpoint specifications.
- The default behavior of *quota* has been changed so that it only processes filesystems that the user has attached and to which he has write access at the top-level.
- A new option, `a`, has been added so that *quota* will process all attached and mounted filesystems.
- *quota* will no longer have problems determining the quota information of a private AFS volume; it was neglecting to set the effective uid to the user before trying to retrieve the volume information.
- The problems that caused *quota* to die trying to *realloc* memory on the RS/6000 have been fixed.
- Warnings will now be printed when a user reaches 90

7.5 Moira

- Moira now compiles on SunOS 4.1.2.
- *blanche*, *chpobox*, *listmaint*, and *moira* try to prevent the user from setting up bad mail forwarding through the mailhub. It will not let you setup a pobox to a "foreign" address that is really on the local mailhub. It also will not let you enter type "string" mailing list members that do not indicate a foreign address.

- *mailmaint*, *listmaint*, *moira*, and *namespace* no longer have options to "Show all mailing lists" or "Show all groups". There are too many lists in the database for this to be a reasonable request. Note, however, that "Show all public mailing lists" is still a valid option.
- *moira* now has a comments field on each user account and will indicate if the account info has been cryptographically signed.
- *moira* now will retrieve all filesystems on a given machine.
- *moira* no longer encrypts ID numbers.
- *moira* now warns that retrieving all the users in a given class will take a long time and asks for confirmation.
- *moira* now handles AFS lockers more gracefully, and will fill in proper defaults for them.
- *mrcheck* has a new option, **-noauth**, which causes it to run without authentication.
- *moira* on the DECstation had several coredump bugs because of dereferenced NULL pointers. Specifically, it would coredump if you attempt to retrieve quotas on a non-existent locker [changes.74#1659]. Also, it would coredump if you attempt to retrieve the members of a filesystem group but do not have permission [changes.74#1565].
- *update_server* now looks in */etc/athena/srvtab* rather than */etc/srvtab* to get its service keys [changes.74#1670].

7.6 AFS

A new version of AFS (3.1b) with Athena enhancements has been incorporated into this release. The primary differences between this new version and the version in Athena Release 7.3P are listed below.

- Some security holes in the RX transport layer have been fixed.
- Servers of remote cells are only polled if they were marked as down or if the client has any callbacks registered with the server.
- The ctime of files may now be examined. Currently, everything will modify the ctime of a file except a rename operation.
- If timeservice is being provided by AFS and the primary time server dies, the client will now roam for a new time server.
- Clients now check to make sure that the server has not returned a "disk full" message.
- A memory leak associated with the cleanup of user credentials has been fixed. This is most prevalent on an AFS-NFS translator.
- The RS/6000 will now translate "over quota" messages from the server properly, rather than believing that the error means "network is down".
- The RS/6000 kernel extension, without NFS translation support (the default), will mark AFS as a remote filesystem. This will fix problems associated with the testing to see if a user has a local home directory.

- *fs* has been fixed so that *-cell* is handled better, better error codes are returned, and the help message now is displayed correctly.

7.7 Turnin

- Starting with this release the NEOS libraries are included in the release. This includes *libfxrpc.a* and the header files in */usr/athena/include/fx*. The man page *fxcl.3* has been added.
- [changes.74#1664] *turnin* fix for more stringent compiler
- [changes.74#1690] *return* and *collect* were not checking on *prep_paper* status. On error, memory is properly freed.
- [changes.74#1691] *pickup*, *collect* were not checking the return value of *fclose* resulting in lost data if a user was over quota.
- [changes.74#1692] Better error messages given to graders who have not created the proper directories.
- [changes.74#1693] Interrealm Kerberos is now supported on client and servers.

7.8 EZ

MIT has the latest Andrew version. Many bugs have been fixed.

Note that CMU has changed the version numbering scheme (again) and the current version number is 5.1.1.

7.8.1 User visible changes

We have enabled the menubar by default. Now, in addition to the deck-of-cards menus you have always had, you will see a bar across the top of your screen with the menus. This change was done to make *ez* look more like the majority of the X applications we run.

On color screens, the scrollbars have a 3 dimensional look.

Menus come up in a skinny font. This makes the menus smaller.

The text with the **Format Note** style now displays on the screen with a line through the text to give tangible evidence that something special is going to happen with the text. (We investigated drawing the text in grey or in a color, but the visibility of the characters was much better with the 'line through the text' design.)

The **datapros** command has gone away. In the previous release it was a script that told you to run **datacat**, the command that acts the same but has the standard name, instead.

A subtle change was made in the way Andrew fonts are mapped to X fonts on the screen. This may cause a few fonts to appear of a different size on the screen than you are used to. Your file will print the same as it always has.

7.8.2 For users of the andrew locker

You *never* again have to worry about attaching the wrong andrew locker!

The andrew locker will always contain the current version that matches the system packs, but will also contain other versions: one for compatibility with the previous Athena release, and one that is experimental for use by friendly testers. The system packs contain a subset of Andrew that understands which version to look for when accessing advanced features from the locker. You can find the current versions of things under `/mit/andrew/5.1`.

If you have init files such as `.ezinit` which included files from the andrew locker you probably had a line like this in them:

```
include /mit/andrew/rt/lib/global.prf
```

A new way of specifying the current correct andrew directory automagically has been added. You would change the above line to read:

```
include $ANDREWDIR/lib/global.prf
```

and `ez` would find the `global.prf` file relevant to whatever version of andrew you were running. (Unless you ran the old Athena 7.3 version which doesn't know how to do this.)

NOTE: If you leave you include commands in the first form, you will get the old Athena 7.3 versions of the included files. When Athena 7.5 comes out, there won't be any files there, because everything in the Andrew locker will have moved below a version number.

7.8.3 Bug fixes

Various core dumps fixed including a fix for when running on a Grey Scale display

Various memory leaks plugged (to keep `ez` run small) including a fix for the situation in which certain files with defined tabs would grow `ez` by 20K every time the screen drew.

Cutting and pasting from **XClipboard** no longer hangs.

Users of `ez` who edited files via symbolic links got different behavior from what users of GNU Emacs got. (A symbolic link is a way for several names to point to one destination file.) Now the behavior is the same as it is in GNU Emacs: A copy of the old file is made in the directory containing the symbolic link. The changes you make are done to the *destination* file of the symbolic link. (They used to be done by replacing the link with a file rather than modifying the destination.)

The **ahelp** command now has the **Printer Setup** command as `ez` does. (It used to have **Set Printer** which is being phased out in favor of the dialog box based **Printer Setup** command.)

In `ctext`, switch statements are now indented correctly.

Certain files that used to appear blank on the screen now draw correctly.

The memo template now says MIT Information Systems instead of Project Athena.

The key bindings for style commands such as **bold** and **italic** were not documented in the online help. The `ezstyle.help`, and `ezkeys.help` pages have been modified to do so.

7.8.4 Enhancements

Reading a large X bitmap into **raster** is faster.

Dithering of Color X window dumps in **raster** is faster and makes more sensible choices about what to transform the colors to.

Operation on color displays is faster.

Redrawing screen after dialog box is now faster.

The **include** command in init files now understands environment variables embedded within target file-names. Where **\$FOO** (or **\$(FOO)** or **\${FOO}**) appears in a target name and **FOO** is an environment variable, it's now replaced with the value of **FOO**.

The **hyplink** object also understands environment variables in the same way.

The **ADEW** application builder is much cleaned up.

7.8.5 New features

The **preview** command now contains additional key bindings:

Next page: C-v (in addition to space)

Previous Page: M-v, DEL, C-h, BACKSPACE, b

Two new commands have been added to the **File** menu card to deal with Raw formatting have been added to **ez** and all the other Andrew text-based editors (such as **eos** and **grade**):

Save Plainest As Prompts for a filename and saves with formatting stripped off.

Visit Raw File Looks to see if there's already a buffer containing the named file and switches to it. Otherwise read a file raw and does not interpret **EZ** formatting commands.

Use the **Save Plainest As** command when you've somehow gotten formatting into a file that is supposed to be for plain text. (For example, if you paste from **olh** into your plain text file, there is currently a bug which formats the file without telling you.)

Use the **Visit Raw File** when you want to modify the formatting commands contained within an **EZ** file. (For example when the file gets a set of styles that so confuses **ez** that you can't make sense of the formatting.) **NOTE:** If you have already read the file in regular mode, **EZ** will not read the file in again. You have to either start another **EZ**, or use **C-X k** to kill **EZ**'s internal copy of the regular mode file.

The **raster** command now has menu commands to take X window dumps.

The **PostScript** inset can draw the postscript if run on **DECMIPS** or **RS/6000** (the **VAX** and **RT** don't have the required **PostScript X** extension.)

Environment variables are now legal in the pathnames given to the "include" command in init files.

The **andrew** multi-media mail system is now compliant with the emerging **MIME** multimedia mail standard.

In **messages** a new command has been added: **Append to Raw File** which does what we've wanted for a long time: It eliminates those silly **begindata{text822}** headers.

- *gettime* will wait for *named* to startup if it cannot resolve the hostname due to lack of name service. (No change if the host does not exist). This caused VAX and RT's to sometimes not have the proper time on reboot as name service took longer to start than was expected.