

Introduction to Electronic Mail

Geoff Mulligan
Network Systems Laboratory
geoff@pa.dec.com

digital

Network Systems Laboratory

Overview

- ❑ What is Electronic Mail
- ❑ Mail message formats
- ❑ Mail addressing
- ❑ Mail Software

Overview (cont)

- ❑ Mailing Lists
- ❑ Netnews
- ❑ Digital's Internet Presence
- ❑ For Further Information

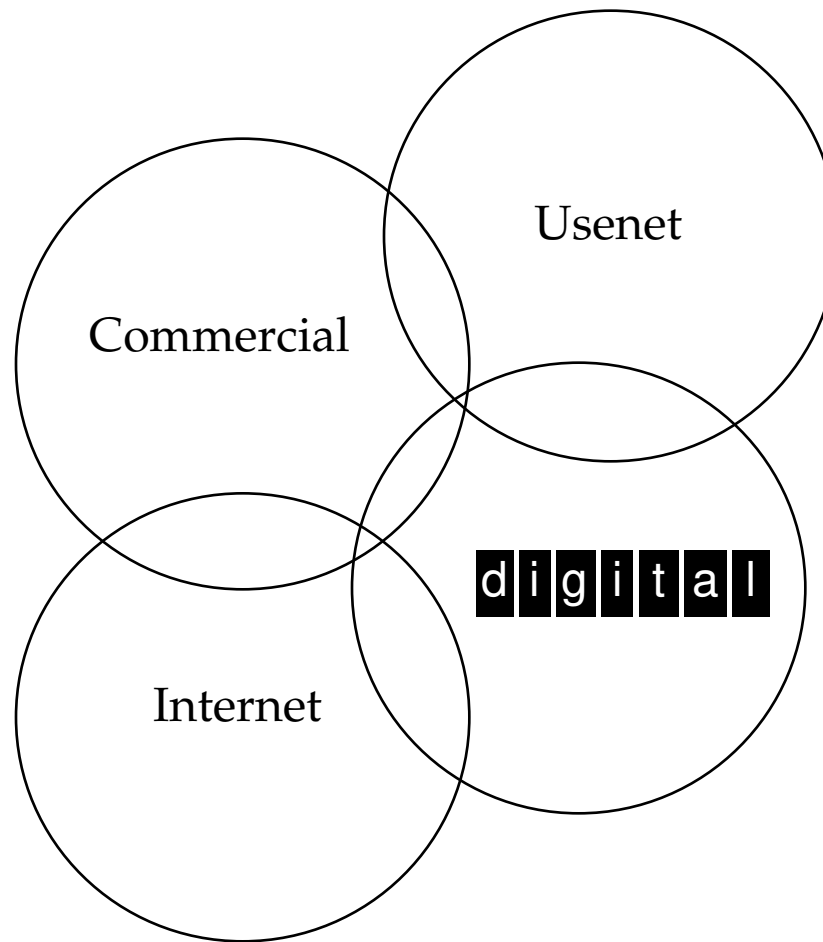
Electronic Mail

- ❑ Most widely used network application
- ❑ One-to-one (mail)
- ❑ One-to-many (mailing lists)
- ❑ Many-to-many (computer conference)

Electronic Mail

- ❑ Similar to postal service
 - delivery of messages to specific address
 - delay before being received
- ❑ But different
 - e-mail delivery almost always faster
 - e-mail usually less expensive
 - e-mail reliability varies considerably
 - e-mail more difficult to send multi-media
- ❑ Allows user to post a message to one or several other users.

Interconnectivity



digital

Network Systems Laboratory

Commercial Use

- ❑ In the old days, "research only".
- ❑ Rules have changed!
- ❑ Vendors are encouraged to provide assistance via Internet.

Commercial Use – New Rules

You may now:

- ❑ Publish Internet mail addresses in commercial material
- ❑ Exchange mail with customers
 - documentation
 - bug reports
- ❑ Provide product information via mailing lists
 - "junk mail" not permitted
- ❑ Send field test software and documentation

Mail Etiquette

- ❑ Mail is not like other media
- ❑ Remember, there's a *person* at the other end
- ❑ Flaming (raving)
- ❑ Choose an appropriate forum
- ❑ Read other messages before responding

Mail Etiquette

- ❑ Don't post in anger
- ❑ Be brief
- ❑ Be explicit about humor and sarcasm
SHOUTING, *emphasis*, <FLAME ON>, <sarcasm> :-) ;-) :-(
- ❑ Assume permanence of messages
- ❑ Label your message - good subject :

Message Format

- ❑ Message divided into **headers** and **body**.
- ❑ Headers comes first, terminated by a blank line.
- ❑ A header has a basic format:

```
field-name: field-body
```
- ❑ Body has no specific format.

Sent Message Format

```
To: Geoff Mulligan <mulligan@pa.dec.com>  
Cc: town@ujucbe32.bitnet  
Subject: Next meeting
```

Geoff,

How about getting together to discuss
the network design next Monday.

Steve

Received Message Format

```
From: Steve Smith <smith@ocean.uucp>  
To: Geoff Mulligan <mulligan@pa.dec.com>  
Cc: town@ujucbe32.bitnet  
Subject: Next meeting  
Message-Id: <9205151338.AA1203@ocean.uucp>  
Date: Mon, 15 May 92 13:38:25 -0800
```

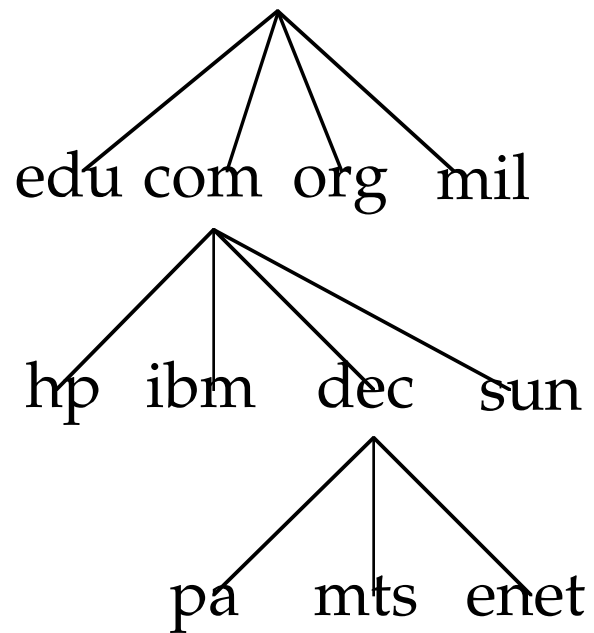
```
Geoff,  
    How about getting together to discuss  
    the network design next Monday.
```

```
Steve
```

Naming v.s. Addressing

- ❑ IP packet transport works with addresses
- ❑ People like to use names
- ❑ Names must be translated to and from addresses
- ❑ Domain Name System (DNS)
Not DECdns!

Domains



Why Domains?

To: Tom_Sullivan

There might be many Tom Sullivans, but he is at a university.

To: Tom_Sullivan@**illinois**
University or State?

To: Tom_Sullivan@illinois **edu**
That is still not unique, but he is in the EE department.

To: Tom_Sullivan@**ee**.illinois.edu
Found him!

Addresses must be unique!

Mail addressing

- ❑ General form of Internet mail addresses:
user @ sub-domain . domain
- ❑ Left hand side (**user**)
 - May be an actual user
 - May be a route to final destination
- ❑ Right hand side (**domain**)
 - Valid Internet domain name

Sample Addresses

Simple mail addresses:

```
mulligan @ pa.dec.com
  geoff @ usafa.af.mil
  geoff @ fernwood.mpk.ca.us
  arthur @ arthur.cs.purdue.edu
  stien @ astrix.luftfahrt.uni.stuttgart.de
  cole @ tuthjk23.bitnet
```

Complex mail addresses:

```
cloud!steam!hot!john @ apple.com
stratus!smoke!transfer!steve @ decwrl.dec.com
uninet!sec-rqst%zardoze.uucp @ ICS.UCI.EDU
  MCRO_JMW%JMUVMX1.BITNET @ CUNYVM.CUNY.EDU
"delni::mrgate::\"a1::bouchard.mike\""@delni.enet
```

Address Forms

- ❑ All of these are treated identically:

```
From: mulligan@pa.dec.com (Geoff  
Mulligan)
```

```
From: Geoff Mulligan  
<mulligan@pa.dec.com >
```

```
From: mulligan@pa.dec.com
```

- ❑ Same for To : field

```
To: mulligan@pa.dec.com (Geoff Mulligan)
```

```
To: Geoff Mulligan <mulligan@pa.dec.com>
```

```
To: mulligan@pa.dec.com
```

% and !

- ❑ Percent sign and exclamation points in an address
The mailbox name is probably not a user, but instead an address to be interpreted by the receiving system.

- ❑ Percent sign

`% → @`

`smith%well.com@wrl.dec.com`

wrl.dec.com will receive the message and forward it to:

`smith@well.com`

- ❑ Exclamation point

Manual routing of message

`stratus!smoke!steve@decwrl.dec.com`

`decwrl → stratus → steve@smoke`

Mailing List Etiquette

- ❑ There are thousands of mailing lists dealing with thousands of topics.
- ❑ To request to be added to a list send a message to:
`list-request@domain`
(e.g. `pdp8-lovers-request@ai.mit.edu`)
- ❑ Send submissions (messages) to:
`list@domain`
(e.g. `pdp8-lovers@ai.mit.edu`)
- ❑ **Do NOT send requests to:**
`list@domain`

Domain Naming in Digital

- ❑ Digital owns the domain **dec.com**
- ❑ Currently 125 subdomains assigned
- ❑ Usually allocated by site code
- ❑ Special-purpose subdomains:
mts enet
- ❑ Examples – *site.dec.com*
alf.dec.com
tay.dec.com

Internal Mail Addresses from Ultrix*

- ❑ To Ultrix user on own machine just use the name:
To: mulligan
- ❑ To VMS user ANCHOR::JONES, send to:
To: jones@anchor.enet
- ❑ To Digital All-in-1 user:
To: Ken.Olsen@MLO.MTS
- ❑ To Ultrix user in another organization, use domain:
To: smith@flume.zk3.dec.com

*with IP connectivity and Avolio sendmail.cf

External Mailing Addresses from Ultrix*

- ❑ To Internet address:

 - To: `vcerf@nri.reston.va.us`

 - To: `0004011494@mcimail.com`

 - To: `71511.43@compuserve.com`

- ❑ To USENET address:

 - To: `adobe!warnock@decwrl.dec.com`

 - To: `microsoft!gates@decwrl.dec.com`

*with IP connectivity and Avolio `sendmail.cf`

digital

Network Systems Laboratory

External Mailing Addresses from Ultrix

- ❑ Using standard sendmail.cf and IP:

To: "ackers@ibm.com"@decwrl.dec.com

To: "0007130331%mcimail.com"@decwrl.dec.com

To: "68813.40%compuserve.com"@decwrl.dec.com

- ❑ Using standard sendmail.cf and **no** IP:

To: decwrl::"packard@hp.com"

To: decwrl::"000319104%mcimail.com"

To: decwrl::"54313.40%compuserve.com"

External Mailing Addresses from VMS

❑ From VMS mail

To: nm%US1RMC::"hewlett@hp.com"

To: nm%DECWRL::"packard@hp.com"

To: nm%VBORMC::"sc@cci.com"

❑ From All-in-1

To: "mcnealy@sun.com" @ INTERNET

To: "pkahn@borland.com" @ DECWRL @ VAXMAIL

To: _DECWRL::"0005551212@mcimail.com"

To: _DECWRL::"ga@amdahal.com"

Business Cards

- ❑ Now authorized to put Internet e-mail address on business card
- ❑ Must use `username@site.dec.com!`
- ❑ Might be necessary to contact local subnet manager
 - May need to change some configuration

Receiving Internet Mail

- ❑ Internet address:
geoff@pa.dec.com
- ❑ MTS address:
Geoff Mulligan@UCH
Internet form is:
Geoff.Mulligan@UCH.MTS.DEC.COM
- ❑ DECNET address (**not on business card**):
jove::geoff
Internet form is:
geoff@jove.enet.dec.com

Failed Mail

From: MAILER-DAEMON@wombat.bungi.COM
Subject: failed mail
To: **decwrl.dec.com!geoff@apple.com**
Date: 15 Dec 90 10:16:32 PDT (Sat)

```
=====      command failed      =====  
  COMMAND: /etc/local/rmail 'doug'  
===== text of message follows =====
```

```
>From daver!voder!stratus!oliveb!apple.com!decwrl.dec.com!geoff  
Received: by daver.bungi.com (/\/=-\/ Smail3.1.18.1 #18.16)  
      id <m0ikgOt-0000KYC@daver.bungi.com>; Sat, 15 Dec 90 10:14 PST  
Received: from stratus.UUCP by voder.nsc.com (5.61/1.34) with UUCP  
      id AA08144 for wombat!doug; Sat, 15 Dec 90 07:51:19 -0800  
Received: by stratus.swdc.stratus.com (/\/=-\/ Smail3.1.17.5 #17.19)  
      id <m0ikcdW-0004GSC@stratus.swdc.stratus.com>; Sat, 15 Dec 90 06:13 PST  
Received: by oliveb.OLIVETTI.COM (smail2.5)  
      id AA05781; 15 Dec 90 05:09:31 PST (Sat)  
Received: by decwrl.dec.com; id AA02618; Sat, 15 Dec 90 04:59:56 -0800  
Received: by decpa.pa.dec.com; id AA22516; Thu, 13 Dec 90 11:58:13 -0800  
Received: from transfer.stratus.com by uunet.uu.net (5.61/1.14) with SMTP  
      id AA00574; Thu, 13 Dec 90 14:57:59 -0500  
Received: from lectroid.sw.stratus.com by transfer.stratus.com (4.1/SMI-4.0 Stratus Computer)  
      id AA28054; Thu, 13 Dec 90 13:57:56 EST  
Received: from transfer.stratus.com by lectroid.sw.stratus.com (4.1/SMI-4.0 Stratus Computer)  
      id AA18538; Thu, 13 Dec 90 14:54:56 EST  
Received: from apple.com by transfer.stratus.com (4.1/SMI-4.0 Stratus Computer)  
      id AA28051; Thu, 13 Dec 90 13:57:52 EST  
Received: by apple.com (5.61/25-eef) for wombat!doug@swdc.stratus.com  
      id AA18697; Thu, 13 Dec 90 11:57:50 -0800  
Date: Thu, 13 Dec 90 11:57:50 -0800  
From: Geoff Peck <daver!voder!apple.com!geoff>  
Message-Id: <9012131957.AA18697@apple.com>  
To: stratus!wombat!doug@apple.com  
Subject: Re: knives  
Good. I've bought the remaining stuff already as singles...
```

Failed Mail

- ❑ Mail is queued up for delivery to next hop for up to 3 days, usually
- ❑ Problems - send mail to `postmaster@domain`

```
Return-Path: uucp@apple.com
Received: by nsl.pa.dec.com; id AA28357; Thu, 20 Feb 92 05:36:35 -0800
Received: by inet-gw-1.pa.dec.com; id AA14688; Thu, 20 Feb 92 05:36:16 -0800
Received: by apple.com (5.61/10-Dec-1991-eef)
      Date: Thu, 20 Feb 92 05:29:38 -0800
Message-Id: <9202201329.AA25096@apple.com>
From: MAILER-DAEMON@apple.com (Postmaster's Assistant)
Subject: Failed UUCP Mail
To: mulligan

After 48 days (1166 hours), your message to the following people:
      whittingham (host=nuvotec)
could not be delivered.
      ----- Unsent message follows -----
Received: from inet-gw-1.pa.dec.com by apple.com with SMTP (5.61/10-Dec-1991-eef)
      Received: by inet-gw-1.pa.dec.com; id AA20294; Thu, 2 Jan 92 15:10:40 -0800
Received: by future.pa.dec.com; id AA19207; Thu, 2 Jan 92 15:10:36 -0800
Message-Id: <9201022310.AA19207@future.pa.dec.com>
To: nuvotech!whittingham@apple.com
Subject: hello.
Date: Thu, 02 Jan 92 15:10:35 -0800
From: Geoff Mulligan <apple!Pa.dec.com!mulligan>
X-Mts: smtp
```



Components of a Mail System

- ❑ Mail handler (user agent)
- ❑ Mail delivery system (transfer agent)
- ❑ Mail database/storage system

- ❑ VMS: all handled by the same program
- ❑ Ultrix: each handled by a different component

Ultrix Mail Handlers

- ❑ mail - Bell Labs – ultra-primitive.
- ❑ Mail - Berkeley – similar to VMS mail.
- ❑ Mm - like mm on Tops-20
Available on gatekeeper
- ❑ Elm - Screen oriented mail system
Available on gatekeeper
- ❑ Mush - mail users shell
Available on gatekeeper
- ❑ mh - Rand Corp. – basis for many systems

MH Based Mail Systems

- ❑ msh - Terminal based system
- ❑ mhe - Built on Gosling/Unipress emacs.
- ❑ mh-rmail - Built on GNU emacs.
- ❑ xmh - MIT X-windows.
- ❑ dxmail - DECwindows.

"Handling" Mail

- ❑ Get mail from system mailbox
- ❑ Read messages
- ❑ Accomplish disposition (delete, file, forward, etc.)
- ❑ Compose messages (interface with text editor)
- ❑ "Post" messages (hand off to delivery system)

Keeping Current: NEWS

- ❑ The Internet world uses "netnews" instead of VAXnotes.
- ❑ Netnews solves a problem similar to VAXnotes, but works much differently.
- ❑ Reaches over 6 million people in 43 countries (30,000 companies and universities)

Newsgroups

- ❑ Divided into hierarchies
- ❑ Top level:
 - comp, misc, rec, sci - discussions
 - alt, talk, soc - anything goes
 - biz, clari - business
 - location* - local issues
 - dec - within Digital (sort of!)
 - fj, sfnet, de - foreign language
 - news - news administration
- ❑ Over 3500 news groups
- ❑ dec.notes.*

Sample Newsgroups

comp.databases	Database and data management issues and theory.
comp.editors	Topics related to computerized text editing.
comp.graphics	Computer graphics, art, animation, image processing.
comp.lang.*	There are groups for almost every computer language.
comp.multimedia	Interactive multimedia technologies of all kinds.
comp.newprod	Announcements of new products of interest. (Moderated)
comp.org.*	Newsgroups about DECUS, Sun Users Group, USENIX and IEEE
comp.os.vms	DEC's VAX* line of computers & VMS.
comp.periphs.*	Peripheral devices.
comp.protocols.iso	The ISO protocol stack.
comp.protocols.tcp-ip	TCP and IP network protocols.
comp.sys.*	Just about every company has one or more, but see alt.sys.sun for Sun.
comp.sys.dec	Discussions about DEC computer systems.
comp.sys.hp	Discussion about Hewlett-Packard equipment.
comp.unix.admin	Administering a Unix-based system.
comp.unix.aix	IBM's version of UNIX.
comp.unix.questions	UNIX neophytes group.
comp.unix.ultrix	Discussions about DEC's Ultrix.
comp.unix.wizards	Questions for only true Unix wizards.
comp.windows.x	Discussion about the X Window System.
comp.windows.x.motif	The Motif GUI for the X Window System.
news.announce.newgroups	Calls for newgroups & announcements of same. (Moderated)
news.announce.newusers	Explanatory postings for new users. (Moderated)
news.lists	News-related statistics and lists. (Moderated)
news.newusers.questions	Q & A for users new to the Usenet.
biz.comp.hardware	Generic commercial hardware postings.
biz.comp.services	Generic commercial service postings.
biz.comp.software	Generic commercial software postings.
biz.dec	DEC equipment & software.

NEWS Software

- ❑ XRN (Xwindows), DXRN (DECwindows), MXRN (Motif)
 Ultrix - `decwrl::/archive/pub/DEC/dxrn.tar.Z`
 Ultrix - `UFP::SYS$KITS:[XRN]XRN.TARZ`
 VMS - `UFP::SYS$KITS:[XRN]DXRN.EXE OR MXRN010.EXE`
- ❑ VNEWS - John T. Coburn (CLOVAX::COBURN)
 `CLO::DISK$USER1:[COBURN.VNEWS_DIST]GET-VNEWS.COM`
 This command procedure will copy the needed pieces of VNEWS.
- ❑ GNUS & GNEWS - available on gatekeeper under GNU
 requires gnuemacs
- ❑ NN - available on gatekeeper in news
 screen based news reader
- ❑ RN - available on gatekeeper under news

NNTP Software

- ❑ Network News Transport Protocol
- ❑ RFC 977
- ❑ Provides efficient transmission of news
- ❑ Client and/or Server Mode
- ❑ Available from
 - `decwrl::"/pub/news/nntp"`
- ❑ For server must also have cnews
 - `decwrl::"/pub/news/c"`

NNTTP Servers*

LOC	NODE	NUMB	EASNet	TCP/IP	NAME
abo	decabo	17348	16.964	16.74.0.2	(decabo.abo.dec.com)
buo	deceds	26647	26.23		
cxn	shodha	8912	8.720	16.63.96.2	(shodha.cxn.dec.com)
dco	decuac	36915	36.51	16.67.32.1	(decuac.dec.com)
fac	lemans	34949	34.133	16.75.32.9	(lemans.det.dec.com)
jit	tkou02	60156	58.764	16.152.64.2	(tkou02.jit.dec.com)
lkg	nntpd	56696	55.376	16.20.0.162	(nntp.lkg.dec.com)
ltn	sousa	29872	29.176	16.120.0.31	(sousa.ltn.dec.com)
mko	e2big	32752	31.1008	16.126.16.1	(e2big.mko.dec.com)
mro	ryn	21662	21.158	16.25.0.1	(ryn.mro4.dec.com)
nyo	datum	33325	32.557	16.69.128.12	(datum.nyo.dec.com)
pko	engage	24729	24.153	16.124.0.254	(engage.pko.dec.com)
reo	hollie	43211	42.203	16.36.80.4	(hollie.rdg.dec.com)
soo	loke	51624	50.424		
uco	usenet	10392	10.352	16.1.16.73	(usenet.pa.dec.com)
unt	cssec4	50844	49.668	16.185.96.113	(cssec4.unt.dec.com)
uvo	decuk	41990	41.6	16.182.128.1	(decuk.uvo.dec.com)
vbo	uninet	52631	51.407	16.36.192.43	(uninet.vbo.dec.com)
wfo	sniff	18608	18.176	16.129.128.2	(sniff.wfo.dec.com)
wro	oct17	30779	30.59	16.60.160.4	(oct17.dfe.dec.com)
zso	rust	10416	10.176	16.64.0.1	(rust.zso.dec.com)

* This information may be out of date

Getting NETNEWS Service

- ❑ Get and install news software, point to local NNTP server and subscribe!
- ❑ Send mail to `usenet@pa.dec.com`
- ❑ If more than 5 local news readers and no local nntp server, consider setting one up.

Digital's Internet Presence

- ❑ Mailing lists and News
- ❑ Public archives on gatekeeper
 - Documentation
 - SPDs
- ❑ New services
 - Customer Satisfaction responses
 - Electronic SPRs
 - DECdirect

Visibility

- ❑ Subscribe to mailing list and newsgroups
- ❑ Read past sample of past messages, look for FAQ (Frequently Asked Questions)
- ❑ Answer questions and correct errors about DEC hardware and software
- ❑ Don't ask simple questions about DEC products on general news groups, **use dec.*!**
- ❑ Create a new mailing list or newsgroup

Mailing Lists vs Newsgroups

- ❑ Anyone can create a mailing list; vote required to create a news group
- ❑ Anyone can read a newsgroup; must be added to mailing list by list owner
- ❑ Policy on content is the same.

Mail Example

Date: 01 May 92 15:32:00 BST
From: Ian Dunkin <imd1707@uk0x08.ggr.co.uk>
Subject: Request for router recommendations

Last January Bill Pyle (<BILLP@IDUI1>) posted on this list a request for router recommendations, and Gene.Hastings@boole.ece.cmu.edu replied suggesting investigating the Cisco AGS+.

I know too that Cisco routers feature generically in the routers satisfaction poll in the FAQ.

But I'd like to canvass again for router suggestions and recommendations, with slightly different requirements to before, and also because I know that new products will now no doubt be available.

What we after is a router with the following capabilities..

- FDDI support
- FDDI translation
- Protocols: TCP/IP, DECnet (phase 4 and 5), XNS, IPX/SPX
- Routing protocols: OSPF, BGP
- Cope with speeds up to T3

Any suggestions for a router approaching these capabilities? Also **how do DEC's offerings compare?**

Also, does anyone know which vendors are committed to open systems protocols like IS-IS, ES-IS?

I.

Mail Example

CA-92:07

CERT Advisory
March 31, 1992
AIX /bin/passwd Vulnerability

The Computer Emergency Response Team/Coordination Center (CERT/CC) has received information concerning a vulnerability with the passwd command in AIX 3.2 and the 2007 update of AIX 3.1.

IBM is aware of this problem, and a fix is available as apar number "ix23505". Patches are available for AIX 3.2 and the 2007 update of AIX 3.1.

This fix may be ordered from Level 2 support or by anonymous ftp from software.watson.ibm.com (129.34.139.5) on the Internet.

1. To order from IBM call 1-800-237-5511 and ask that the fix be shipped. Patches may be obtained outside the U.S. by contacting your local IBM representative.
2. If you are on the Internet, use anonymous ftp to obtain the fix from software.watson.ibm.com.

Patch	Filename	Checksum
AIX 3.2	pub/aix3/pas.32.tar.Z	54431 2262
AIX 3.1 2007	pub/aix3/pas.31.tar.Z	06703 99

Patches should be retrieved using binary mode.

IBM is currently incorporating the fix into the 3.2 version and 3.1 updates of AIX. Future shipments of these products should not be vulnerable to this problem. If you have any questions about products



Mail Example

SunSoft Unveils Industry's First General Purpose
Transport-Independent RPC Toolkit

SunFLASH Vol 39 #5

March 1992

Novell, Borland, Lotus, AST Research Endorse Technology

MOUNTAIN VIEW, Calif-- March 4, 1992 -- Expanding its leadership in distributed computing, SunSoft today announced the industry's first general purpose Transport-Independent Remote Procedure Call (TI-RPC) Toolkit for client-server application development. TI-RPC combined with code generation technology from NetWise, Inc. is a part of the ONC distributed computing services provided in the SunSoft Solaris solution. Called the ONC RPC Application Toolkit, this advanced development platform enables software developers to create a single version of a client-server application that runs unmodified across a range of operating systems, hardware platforms and networks. The toolkit and several implementations of TI-RPC were tested today at the Connectathon '92 interoperability event in San Jose, Calif.

[MANY PARAGRAPHS DELETED]

+++++

For information send mail to **info-sunflash@sunvice.East.Sun.COM**.

Subscription requests should be sent to **sunflash-request@sunvice.East.Sun.COM**.

Archives are on **solar.nova.edu**, **paris.cs.miami.edu**, **uunet.uu.net**, **src.doc.ic.ac.uk** and **ftp.adelaide.edu.au**

All prices, availability, and other statements relating to Sun or third party products are valid in the U.S. only. Please contact your local Sales Representative for details of pricing and product availability in your region. Descriptions of, or references to products or publications within SunFlash does not imply an endorsement of that product or publication by Sun Microsystems.

John McLaughlin, SunFlash editor, **flash@sunvice.East.Sun.COM**. (305) 776-7770.

Personal Aliases

- ❑ Allows **user** to have name for one or many other remote and/or local users
- ❑ Format and location specific to mail system

To: hackers
 actually sent to:

To: mulligan, smith, jones@wse.pa.dec.com

System Aliases

- ❑ Allows **entire system** to have name for one or many other remote and/or local users
- ❑ Format and location specific to mail system
- ❑ Facility for creating mailing lists

Setting up a Mailing List

- ❑ You can set up your own mailing list or news group
- ❑ Mailing list setup is system dependent
- ❑ Make sure to create both a list and a request address, e.g. `alpha@zko.dec.com` and `alpha-request@zko.dec.com`

Ultrix List Setup

- ❑ List is added to file `/etc/aliases`
- ❑ Create `list`, `list-owner` and `list-request`
- ❑ Example:

```
seal-owner: mulligan@pa.dec.com
```

```
seal-request: seal-owner
```

```
seal: "|/usr/lib/sendmail -oi -oem -fseal-owner seal-real"
```

```
seal-real: jones@stanford.edu, smith@unlv.edu
```

OR

```
seal-real: :include: /usr/local/aliases/seal
```

Internal Sources of Information

- ❑ `gatekeeper.pa.dec.com` or `decwrl::`
- ❑ `jove@pa.dec.com` or `jove::`
- ❑ Internal news groups:
`dec.*`, `dec.ip*`, `dec.mail*`,
`dec.news*`
- ❑ Notes → News gateways
`dec.notes.*`

gatekeeper.dec.com

GATEWAY.DOC	Index-bytime	archive.doc	gateway.ps
GATEWAY.DOC;1	Index-bytime.Z	bin	lost+found
GATEWAY.PS	Index-explain	dev	ls-lR.Z
Index-byname	Index-explain.Z	etc	ls-lRt.Z
Index-byname.2308	README.ftp	gateway.doc	private
Index-byname.Z	README.nfs	gateway.doc;1	pub

gatekeeper.dec.com

DEC

NIST

athena

bsd-sources

comp.sources.games

comp.sources.sun

database

graphics

misc

recipes

GNU

UCB

binaries

bsd-sources-2

comp.sources.misc

comp.sources.unix

doc

mail

net

recipes.tar.Z

ISO

VMS

case

comp.sources.reviewed

comp.sources.x

editors

maps

news

sysadm

Mach

X11

comm

data

games

micro

plan

text

sendmail.cf

- ❑ Ultrix standard delivery system
- ❑ Sends message to one or more people routing over whatever networks are necessary
- ❑ Not intended as a user interface
- ❑ Extremely configurable system

sendmail.cf

- ❑ Extremely complicated configuration file
- ❑ `/etc/sendmail.cf` is the configuration file
- ❑ Digital's standard internal copy of `sendmail.cf` available from Fred Avolio of Ultrix Resource Center, Greenbelt Maryland (DCO):
DECUAC::"pub/sendmail.cf/dec.cf"
DECUAC::"pub/sendmail.cf/dec.cf-iponly"

External Sources

- ❑ The NIC
- ❑ ftp relay
- ❑ finger

The NIC

- ❑ Allow both telnet and ftp connections to Network Information Center
- ❑ Repository for RFCs and other network information in net-info directory
- ❑ Telnet to nic and login with name nic allows access to NICQuery database with host, registered users and protocol information

The NIC

```
nsl> telnet nic.ddn.mil
Trying 192.112.36.5...
Connected to nic.ddn.mil.
Escape character is '^]'.

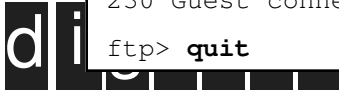
SunOS UNIX (nic.ddn.mil) (ttyp0)

*
* For TAC news, type:                TACNEWS <return>
* For user and host information, type: WHOIS <return>
* For NIC information, type:         NIC <return>
*
* For user assistance call (800) 365-3642 or (800) 365-DNIC or (703) 802-4535
* Please report system problems to ACTION@NIC.DDN.MIL

NIC, SunOS Release 4.1.1 (NIC) #1:
Cmdinter Ver 1.2 Sun May 10 04:13:13 1992 EST
@ whois mulligan
Connecting to id Database . . . . .
Connected to id Database
Mulligan, Arthur G. (AGM11)      ta5433@WESTPOINT-EMH2.ARMY.MIL (914) 938-4041
Mulligan, Brian (BM106)    brian@sphinx.co.uk@EDDIE.MIT.EDU +44 628 75343
Mulligan, Donald E. (DEM10)    SFAE-CM-GPS-RMD@MONMOUTH-EMH3.ARMY.MIL
                                DSN 992-6137 (908) 532-6137
Mulligan, Geoffrey C. (GEOFF)  geoff@USAFA.AF.MIL
                                (719) 472-2549 (DSN) 259-2549
Mulligan, Geraldine (GM302)    ASMEL-RD-TMP@MONMOUTH-EMH3.ARMY.MIL
                                (908) 532-0829 (DSN) 992-0829
There are 9 more matches.  Show them? n
  Enter a handle, name, mailbox, or other field, optionally preceded
  by a keyword, like "host diis".  Type "?" for short, 2-page
  details, "HELP" for full documentation, or hit RETURN to exit.
---> Do ^E to show search progress, ^G to abort a search or output <---
```

FTP relay

```
nsl> ftp gatekeeper 1555
Connected to gatekeeper.dec.com.
220-FTP passthrough server (V1.0mjr)
220-To connect to a remote FTP server give your login as:
220-user@server.serverdomain (EG: anonymous@host.cs.mumble.edu)
220-
220-Prior to FTPing through the gateway, please conserve valuable network
220-bandwidth if possible by checking on gatekeeper.dec.com (DECWRL::) for
220-any publicly available FTP archives.
220-
220-If using Digital Pathways cryptokeys, authorize yourself by sending
220-"authorize <username>" and respond to challenge using "response <##>"
220-If your FTP client doesn't support authentication, use
220-"quote authorize <username>" and "quote response <##>"
220-If your connection is not authorize, you can still copy data inbound.
220-
220 Send bug reports to ftp-gw@crl.dec.com.
Name (gatekeeper:mulligan): anonymous@sumex.stanford.edu
331 Guest login ok, send mail address (user@host) as password.
Password:
230 Guest connection accepted. Restrictions apply.
ftp> quit
```



FTP relay

```
nsl> ftp gatekeeper 1555
Connected to gatekeeper.dec.com.
220-FTP passthrough server (V1.0mjr)
220-To connect to a remote FTP server give your login as:
220-user@server.serverdomain (EG: anonymous@host.cs.mumble.edu)
220-
220-Prior to FTPing through the gateway, please conserve valuable network
220-bandwidth if possible by checking on gatekeeper.dec.com (DECWRL::) for
220-any publicly available FTP archives.
220-
220-If using Digital Pathways cryptokeys, authorize yourself by sending
220-"authorize <username>" and respond to challenge using "response <##>"
220-If your FTP client doesn't support authentication, use
220-"quote authorize <username>" and "quote response <##>"
220-If your connection is not authorize, you can still copy data inbound.
220-
220 Send bug reports to ftp-gw@crl.dec.com.
Name (gatekeeper:mulligan): anonymous@sumex.stanford.edu
331 Guest login ok, send mail address (user@host) as password.
Password:
530 Guest connection rejected at this time. Try again later.
Login failed.
ftp> quit
```



FTP Relay

```
nsl> ftp gatekeeper.dec.com 1555
Connected to gatekeeper.dec.com.
220-FTP passthrough server (V1.0mjr)
220-To connect to a remote FTP server give your login as:
220-user@server.serverdomain (EG: anonymous@host.cs.mumble.edu)
220-
220-Prior to FTPing through the gateway, please conserve valuable network
220-bandwidth if possible by checking on gatekeeper.dec.com (DECWRL::) for
220-any publically available FTP archives.
220-
220-If using Digital Pathways cryptokeys, authorize yourself by sending
220-"authorize <username>" and respond to challenge using "response <##>"
220-If your FTP client doesn't support authentication, use
220-"quote authorize <username>" and "quote response <##>"
220-If your connection is not authorize, you can still copy data inbound.
220-
220 Send bug reports to ftp-gw@crl.dec.com.
Name (gatekeeper.dec.com:mulligan): anonymous@archive.wustl.edu
331 Guest login ok, send your complete e-mail address as password.
Password:
230- This is an experimental FTP server.  If your FTP client crashes or
230- hangs shortly after login please try using a dash (-) as the first
230- character of your password.  This will turn off the informational
230- messages that may be confusing your FTP client.
230-
230- This system may be used 24 hours a day, 7 days a week.  The local
230- time is Tue May 12 15:24:47 1992.
230-
230-Please read the file README
230- it was last modified on Mon Mar  2 08:29:25 1992 - 71 days ago
230-Please read the file README.NFS
230- it was last modified on Thu Feb 20 13:15:32 1992 - 82 days ago
230- Guest login only, access instructions apply.
ftp> quit
```

FTP Relay Commands

cd - Remote change directory
ls, dir - List remote directory
ascii, binary, image, tenex - Set file types
get, mget - Get single or multiple files
!- Execute a local command
lcd - Local change directory
prompt - Toggle prompting for files
pwd - Print remote directory
help, ? - List commands
bye, quit - Exit

finger

- ❑ Provides information about user on local or remote machine:

Username

Fullname

Office, Office number

Home number

Last login

Plan

Project

finger (cont)

- ❑ User on local machine:

```
finger user  
(finger geoff)
```

- ❑ User on remote machine within Digital:

```
finger user@host.domain  
(finger geoff@nsl.pa.dec.com)
```

- ❑ Proxy finger by gatekeeper

```
finger  
user@host.domain@gatekeeper.pa.dec.com
```

finger Example

```
nsl> finger comer@purdue.edu@gatekeeper
[gatekeeper.dec.com]
[purdue.edu]
[comer@merlin.cs.purdue.edu]
Login name: comer          (messages off)   In real life: Douglas Comer
Office: CS-156B, 49-46009
Directory: /homes/dec          Shell: /usr/local/bin/ksh
Since May 10 15:39:32 on tty05 [Comer's house]
Since May  6 11:42:20 on tty2 from lancelet:0.0
New mail received Tue May 12 15:07:17 1992;
  unread since Tue May 12 15:07:19 1992
Project:
Cypress      (Low-cost, multi-protocol network)
Xinu         (Xinu Is Not Unix: Now on a Transputer; TCP; virtual memory)
XinuX        (X-window system running over Xinu on a RISC architecture)
Multiswitch  (Gigabit-speed multiprocessor packet switch)
DLS          (Internet Directory Location Service)
Plan:
  Spring Interop: May 18-22

...busy most of the time - ask Charlotte (tubis@purdue.edu or
  317-494-9160)
```

finger Example

```
nsl> finger wb8foz@mthvax.cs.miami.edu@gatekeeper
[gatekeeper.dec.com]
[mthvax.cs.miami.edu]
Login name: wb8foz                               In real life: David Lesher
Directory: /usr2/users/notum/dl                   Shell: /usr/local/bin/tcsh
Last login Wed Apr 29 04:27 on ttyp0 from reston.ts.psi.ne
Project: NRK Clinic for habitual NetNews abusers - Beltway Annex
Plan:
To break into this machine, and change my password.

A host is a host from coast to coast
& no one will talk to a host that's close
Unless the host (that isn't close)
is busy, hung or dead
```

Further Reading

- ❑ "The Matrix", John Quarterman, Digital Press
- ❑ "!%@:: A Directory of Electronic Mail, Frey and Adams, O'Reilly & Associates, Inc.

MH

- ❑ A set of separate programs.
- ❑ Returns you to Ultrix "shell" between commands.
- ❑ Stores mail as ordinary files in ordinary directories.
- ❑ One message per file.
- ❑ Uses ordinary text editors to edit and display messages.

You have new mail

```
nsl> inc
```

```
Incorporating new mail into inbox...
```

```
112+ 01/10 reid          staff meeting <<This is a reminder that if  
113  01/10 djoseph      1/14/91 Short Courses <<Howdy Steve, Per our  
114  01/10 vixie        fya -- from the bind mailing list <<-----
```

```
nsl> show
```

```
(Message inbox:112)
```

```
To: wr1
```

```
Subject: staff meeting
```

```
Date: Thu, 10 Jan 91 12:54:50 PST
```

```
From: Brian Reid <reid>
```

```
This is a reminder that there will a staff meeting tomorrow.  
Brian
```

```
nsl> next
```

```
To: uchfac@caldec.enet
```

```
Cc: mulligan, peck, terry, dcrocker, djoseph
```

```
Subject: 1/14/91 Short Courses
```

```
Date: Thu, 10 Jan 91 13:30:00 PST
```

```
From: Debra Joseph <djoseph>
```

```
Steve,
```

```
Per our meeting this morning, please have the room setup by 3pm.
```

digital Network Systems Laboratory

MH Commands

- ❑ `inc`: get (incorporate) new mail from mailbox
- ❑ `show`: display a message
- ❑ `next`: display next message
- ❑ `prev`: display previous message
- ❑ `repl`: reply to a message
- ❑ `comp`: compose a message (then send it)
- ❑ `rmm`: delete a message
- ❑ `scan`: show message headers

`inc` **command**

- ❑ Takes all new mail from system mailbox and adds it to your "inbox" folder.
- ❑ Does a scan of the new messages for you.
- ❑ Positions the current message indicator on the first new message.

Read new mail

show **command**

- ❑ Typed without argument shows "current message"

```
show [|lpr]
```

- ❑ Typed with argument shows that message

```
show 17
```

- ❑ Typed with several numbers shows those messages

```
show 10 12 17
```

```
show last:5
```

```
show 10-20
```

<click on message>

next **command**

- ❑ No argument.

next

- ❑ Moves the "current message" forward by one, then shows that message.
- ❑ If there is no "next message", it prints "no next message".

Next

prev command

- ❑ No argument.
`prev`
- ❑ Works just like next, except that it moves backwards and prints "no prev message" when there is no "previous message"

Previous

comp **command**

- ❑ Composes a mail message.

```
comp  
comp -edit emacs
```

- ❑ Drops you into an editor to format and compose message.
- ❑ Default editor name taken from `.mh_profile` (`editor: emacs`).
- ❑ Hands the message off to transfer agent.

Create-Send

repl **command**

- ❑ Typed with no argument replies to current message.
`repl`
- ❑ Typed with an argument replies to that message.
`repl 17`
- ❑ Creates a reply message, then puts you into your favorite editor to edit it.
`repl -edit emacs`
`repl -edit vi 18`

Reply

rmm **command**

- ❑ Typed without argument deletes (removes) current message.

```
rmm
```

- ❑ Typed with argument(s) deletes specified messages.

```
rmm 17 20-25
```

- ❑ Deleted messages might be recoverable.
- ❑ Cleaning up

Delete

scan **command**

- ❑ Typed without argument shows all message headers in "current" folder.

```
scan
```

- ❑ Typed with argument shows headers in that range.

```
scan 1 3 5
```

```
scan 1-20
```

- ❑ To scan last 20 messages in a folder type

```
scan last:20
```

Mail Folders

- ❑ MH mail lives in folders, always
- ❑ `inc`: puts new messages in folder "inbox" (`+inbox`)
- ❑ `scan`: shows message headers
- ❑ `folder, folders`: "ls" command for folders
- ❑ `refile`: move message(s) to a new folder
- ❑ `sortm`: sort messages
- ❑ `pick`: selecting messages

Folder is Context

- ❑ Always a "current folder"
- ❑ All commands operate in it.
- ❑ `rmm 13` means remove message 13 in current folder
- ❑ `rmm +inbox 13` to specify another folder
- ❑ `inc` switches back to `+inbox`

Folders and Files

```
~geoff/Mail
  ~geoff/Mail/draft
  ~geoff/Mail/inbox
    ~geoff/Mail/inbox/1
    ~geoff/Mail/inbox/2
    ~geoff/Mail/inbox/#3
    ~geoff/Mail/inbox/4
  ~geoff/Mail/budget
    ~geoff/Mail/budget/1
    ~geoff/Mail/budget/2
    ~geoff/Mail/budget/3
```

Sample Folders

```
nsl> folders
```

```
Folder      # of messages ( range ); cur msg
archive    has  92 messages ( 1- 93); cur=
72.
archive88  has  45 messages ( 1- 45); cur=
1.
archive89  has 474 messages ( 1- 474); cur=
1.
archive90  has 505 messages ( 1- 505); cur=
505.
drafts     has   2 messages ( 1-  2);
ietf       has  13 messages ( 1- 13);
inbox+     has  37 messages ( 1- 37); cur=
1.
interop    has  40 messages ( 1- 40).
mac        has  10 messages ( 1- 10).
misc       has  18 messages ( 1- 18).
portal     has  29 messages ( 1- 29).
responses  has  27 messages ( 1- 29); cur=
20.
rfc        has  42 messages ( 1- 42).
software  has  29 messages ( 1- 29).
training   has 106 messages ( 1- 107); cur=
```

Looking in a Folder

```
ns1> folder +responses  
responses+ has 27 messages ( 1- 29); cur=  
20.  
  
ns1> folder +archive  
archive+ has 92 messages ( 1- 93); cur=  
72.  
  
ns1> folder +wastebasket  
wastebasket+ has no messages.
```

inbox

Moving Around Folders

```
ns1> scan +ietf
  1 01/12 pgross@nri.reston IETF December Monthly Report
  2 08/20 seger@netman.enet IETF Trip Report
  3 11/09 dcrocker         IETF coordination <<Geoff, In a
  4 12/13 wilde@abyss.zk3.d IETF trip report <<IETF meeting
  ...

ns1> scan +archive last:3
 89 01/11 To:reid          mcpherson mail <<Brian,
 90 01/11 To:reid          your roadshow <<Brian, I want
 91 01/11 To:ns1-staff     dry runs <<Can we all meet

ns1> folder
      archive+ has 92 messages ( 1- 93); cur= 72.

ns1> folder +inbox
      inbox+ has 37 messages ( 1- 37); cur= 1.

ns1> folder -all | grep archive
      archive has 92 messages ( 1- 93); cur= 72.
      archive88 has 45 messages ( 1- 45); cur= 1.
      archive89 has 474 messages ( 1- 474); cur= 1.
      archive90 has 505 messages ( 1- 505); cur= 505.
```

refile command

```
ns1> folder
      inbox+ has    37 messages (   1-  37); cur=   1.

ns1> refile 21 +archive

ns1> folder +archive
      archive+ has   92 messages (   1-  93).

ns1> folder +inbox
      inbox+ has    36 messages (   1-  36); cur=   1.

ns1> refile 25 -link +archive

ns1> folder +archive
      archive+ has   93 messages (   1-  94).

ns1> folder +inbox
      inbox+ has    36 messages (   1-  36); cur=   1.
```

Move

File

Copy

Renumbering Messages

- ❑ `folder -pack`: renumber messages to be 1 to N

Maintenance
Renumber messages

- ❑ `sortm`: sort by date, then renumber

Maintenance
Sort by date

pick **command**

```
pick -from jess
```

```
pick -from jess -and -subj "email courses"
```

```
pick -from reid -or -search easynet
```

```
pick -seq urgent -from reid
```

Pick

Pick from opened folder

Marking Messages

- ❑ Marking a message puts that message in a message sequence.
- ❑ Message sequences are specific to folder.
- ❑ Messages are put into message sequences by mark command.
- ❑ New messages are in unseen.
- ❑ Reading removes messages from unseen.

mark **command**

- ❑ mark: list sequences
- ❑ mark -seq urgent 100 103 adds to sequence urgent
- ❑ mark -delete -seq urgent 100 deletes from sequence urgent
- ❑ scan urgent: show headers from sequence urgent.

Pick
Add to sequence
or
Remove from sequence

Getting Rid of a Sequence

- ❑ Programmer style: edit the file
~/Mail/folder/.mh_sequences
- ❑ By the book:
mark -seq urgent -delete all

Pick

Delete sequence

Compound Commands

- ❑ `scan `pick -from jess`` will show a scan of all the messages from jess.
- ❑ `mark -seq urgent `pick -from jess`` will add all the messages from jess to the sequence urgent.

man **command**

- ❑ Ultrix has thousands of pages of online documentation.
- ❑ It's very easy to use once you understand the Unix vocabulary
- ❑ Use the man command:
man mh
man scan
man mail

apropos **command**

```
nsl> apropos mail
ali (1mh)           - list mail aliases
aliases (5)        - aliases file for sendmail
biff (1)           - be notified if mail arrives and who it is from
binmail (1)        - send or receive mail among users
from (1)           - identifies sender of mail
inc (1mh)          - incorporate new mail
mail (1)           - send or read mail
mailaddr (7)       - mail addressing description
mh(5mh)            - mail - message format for MH message system
mhmail (1mh)       - send or read mail
newaliases (1)     - rebuild the data base for the mail aliases file
prmail (1)         - print out mail in the post office
rcvstore (1mh)    - incorporate new mail asynchronously
rmail (1)          - route mail to users on remote systems
sendmail (8)       - send mail over the internet
slocal (1mh)       - MH receive-mail hooks
```