

CSIRO Radiophysics
M E M O R A N D U M

To: Distribution
From: Martin Ewing *MSE*
Subject: Computer networks

13 December 1985

unc
[Handwritten initials]

We have been discussing the possibilities of networking the RP VAXes to the international research networks. This memo summarizes the communications environment at Caltech's astronomy department as an example of one institution's situation. An appendix presents some information on the Australian ACSNET.

1 LOCAL NETWORK

Caltech has a local area network (LAN) consisting of 10 electrically separate Ethernets connected through a broadband backbone network. At least 2000 ports are to be supported by CITnet - every office, dorm room, and computer. The hardware is supplied by Ungermann-Bass. The Caltech DECnet extends to the Owens Valley Radio Observatory (350 km north) on an occasional basis with a 4800 bps dialup connection.

The network supports at least 3 protocols: DECnet, TCP/IP, and Net/One (a U-B product). DECnet connects some 20 CPUs - VAX and PDP-11. TCP/IP has a similar role for Unix machines, while Net/One is used to connect U-B "Network Interface Units" which create machine-independent virtual circuits between terminals, printers, and CPUs.

Network services include electronic mail, file servers (for microcomputers), print servers (including a service to print mail messages to be posted in Campus Mail), a phototypesetter, Telenet (packet switch) interface, dial-up modem access, and consulting.

2 EXTERNAL NETWORKS

External networks are generally connected to a single host on Campus. The host serves as a gateway between the CITnet LAN and the outside world. Most network nodes, then, have only to worry about hardware and software to communicate with the LAN.

2.1 Internet (Arpanet).

Internet is sponsored by the US Government for Government sponsored research and development. Many US universities, government laboratories, and private firms are connected. Access is supposedly limited to those sponsored by the US government, but this is liberally interpreted. (It is enough that either the sender or recipient is so supported.) There are also nodes in Europe. One Caltech host is connected by a 9600 bps dedicated line to our nearest Internet neighbor. Protocol is TCP/IP. Mail servers use the standard RFC422 mail format [example below].

2.2 BITNET/EARN.

BITNET has sprung from connections between large IBM mainframes in university computer centers. Many universities and laboratories are connected, with some restrictions on access by private firms. IBM underwrites much of the running costs. Coverage is good in the US and a number of other countries including Germany, Holland, Italy, Spain, Israel, Sweden, Japan, etc. The UK is said to be joining, with a link to JANET. The European counterpart to BITNET is EARN (European Academic Research Network). Protocol is IBM RSCS running on 9600 bps lines. Mail formats are confused, but various mailers are available. Gateways with Internet, CSnet, Usenet, etc. are supported.

2.3 Usenet/UUCP.

The Unix networks are relatively chaotic, but are accessible at Caltech's VMS nodes through an Internet gateway. Protocol is UUCP.

2.4 NRAO Network.

The US NRAO operates its own DECnet (area 32) over dedicated lines connecting Charlottesville, Socorro/VLA, Tucson, and Pasadena. At Pasadena, there is a connection to Caltech's DECnet (area 7) as the line continues on to Vector Production's CRAY XMP in Hollywood. (This machine is used for AIPS development in between its normal function - generating animated TV commercials.) The telephone lines are operated at 9600 bps, but with multichannel multiplexors. A given DECnet channel may have lower bandwidth. For example, the Caltech - VLA connection is allocated only 2400 bps.

3 MAIL SERVICES.

Caltech astronomers most often use VMS mail, which can directly address machines on the Campus DECnet, NRAO's DECnet, or some other off-area DECnets (e.g. the High Energy Physics PHYSNET). There is an interface to allow VMS mail users to send and receive mail through the Software Tools (ST) mail system, which must be used to access Internet, Bitnet, or Usenet addresses.

Alternatively, the astronomer can use the ST programs SNDMSG and MSG to send and receive directly to/from the ST environment. Yes, it is confusing to support more than one mail environment! Software Tools mail is superior to VMS mail for far-flung nets since it has store and forward operation.

4 TELECONFERENCES/BULLETIN BOARDS

A useful adjunct to the electronic store and forward mail system is the "bulletin board" - known as a "teleconference" in ST parlance. Users send mail to a standard address, and it is forwarded to teleconference files on all machines requesting the service. Any user may read the accumulated teleconference messages using the TC command.

Teleconferences may be local - referring to Astronomy computing policies, for example, or more global and/or topical. Internet supports hundreds of specialized teleconferences. Some of the more relevant to me are

INFO-VAX	VAX hardware, VMS software, third parties, etc.
INFO-NETS	Network routings, new nodes on-line, etc.
INFO-MAC	Macintosh software and hardware

The NRAO VLBA project is beginning to use teleconferences as a means of coordinating its work.

5 AUSTRALIAN CONNECTIONS

Besides the Austpac connections already available at CSIRO, AAO, et al., there is only one Australian connection to the global "free" or "research" networks. This is a link between Melbourne University (munnar1) and TRW (seismo) in the US. Munnar1, in turn, is hooked into the Australian Computer Science Net (ACSNET), which seems to have a unique protocol. Mail messages, however, appear to have the UUCP format. Once a message is injected to ACSNET, it can be routed anywhere over Bitnet or Internet, although with perhaps less than 100% reliability. I have some correspondence with ACSNET people, which I will append to this memo.

6 SAMPLE INFO-VAX MESSAGE

The following is a sample Internet message as received from the Internet INFO-VAX teleconference:

Topic: info-vax, Entry # 1349
Date: Mon, 9 Dec 85 20:31:32 est
From: garry@LASSPVAX.TN.CORNELL.EDU (Garry Wiegand)
To: info-vax@SRI-KL.ARPA
Subject: Re: Performance of VMS 4.2
In-Reply-To: <8512061255.AA26981@ucbvax.berkeley.edu>
Reply-To: garry%geology@cu-arpa.cornell.edu,arpa
Organization: Cornell Engineering && Flying Moose Graphics

In Article <8512061255.AA26981@ucbvax.berkeley.edu> Brent Sterner said:

> Another site talked to me and asked if anyone on the net
> has seen performance problems with 4.2 relative to 4.1 or 3.x.
> He is seeing a significantly more sluggish system after
> upgrading. Any comments?

The file system slowed down 30-40% on file header operations (Open, Close, Rename,...) with version 4.0 and the wonderful new file ACP. Is this the effect you're seeing?

garry wiegand // FlyMoCo

APPENDIX

Some conversations recorded at Caltech on the subject of communicating with Australian computers, arranged chronologically:

```
=====
Date: Wed, 18 Sep 85 18:11:38 est
From: Patrick Keogh <munari!MSO.anu.oz!KEOGH@seismo.CSS.GOV>
Subject: RE: Astronomy mailings
To: munari!seismo!cit-hamlet.arpa!msev%phobos@seismo.CSS.GOV
```

Dear Martin,

This message comes to you from the following network
ACSNET (The Australian Computer Science Unix network)

```

::
DCSO:: (VMS 750 at ANU)
    ||
    || DECNET 9600 baud leased line
    ||
CSCO:: (VMS 750 at ANU)
    ||
    || DECNET 4800 baud leased line
    ||
MSO:: (VMS 780 at Mt. Stromlo Observatory)
    ||
    || DECNET 9600 baud leased line
    ||
SSO:: (VMS 480 at the 2.3m telescope, Siding Spring)
    ||
    || DECNET 9600 baud leased line
    ||
AAT:: (VMS 780 at the Anglo Australian Telescope, Siding Spring)
    ::
    :: DECNET X.25 (Austpac)
    ::
|
+- AAO:: (VMS 780 at the Anglo Australian Observatory)
|
| Ethernet
|
+- CSIRO Radiophysics at Epping (2x750, et al.)
|
```

So you can see that contact with Radiophysics is not all that hard! At the moment, though, you must route all mail through me, as the ACSNET-DECNET link is in the hands of the Computer Science Dept., who don't trust us!! Just send it to me, and I will happily forward it.

Below is a list of all usernames at MSO (well all relevant ones any way).

PLEASE send me whatever list you currently have (we don't get net.astro and net.astro.expert up here in OZ), so I only find

fleeting references to sites we are interested in.

...

Regards,
Patrick Keogh

Mount Stromlo Observatory
Private Mail Bag
Woden
ACT 2606
Australia

MSO::KEOGH	ANU DECNET
KEOGH@MSO.ANU.OZ	ACSNET (Should be visible from UUCP, ARPA, BITNET)
CANOPUS AA62270	Telex
062 881111	Australian Telecom

```
=====
Date: 07 Nov 85 03:39:31 +1100 (Thu)
To: mse%Phobos@CIT-Hamlet.ARPA
Subject: Re: Network Database & ACSNET
From: Robert Elz <muninari!kre@seismo.CSS.GOV>
```

```
>Date: Tue, 5 Nov 85 23:27:04 PST
>From: mse%Phobos@CIT-Hamlet.ARPA
```

```
>In particular, I am interested in ACSNET, the Australian
>Computer Science Net (UUCP), and other non-commercial Australian
>nets (if any).
```

I might be able to assist you with details of ACSnet (which is NOT a UUCP network - though we mostly interface to the world using UUCP).

Let me know what kind of information you want, though I should point out that we have no centralized list of hosts, so providing something like that is not easy.

```
Robert Elz Postmaster@muninari.oz (the Australian Gateway)
postmaster%muninari.oz@seismo.css.gov
postmaster%muninari.oz@csnet-relay.arpa
(or their new name)
postmaster%australia@csnet-relay.arpa
```

```
=====
Date: 03 Jun 85 03:23:18 +1000 (Mon)
From: Robert Elz <muninari!kre@seismo.css.gov>
Subject: sites-11. List of Australian SunIII nodes
```

I believe that all nodes are reachable over CSNET as

user@host.oz

alternatively, `user%host.oz@csnet-relay` also gets to them, as should `user%host.oz@seismo` or `munnari!host.oz!user@seismo`.

Its probable that `user%host.oz@australia.csnet` and `user%host.oz%australia.csnet@csnet-relay` work too, but I would not encourage the use of "australia" (munari's actual csnet host name I believe) for anything other than mail to "postmaster@australia" for people who know they want to get to australia but don't know anything much more than that.

"Host" in all these cases sometimes includes more domains.

Node & domain names should be case independent, but not all nodes are running that code yet, so using lower-case is best. User names are generally case dependant (this network is mostly made up of Unix machines).

Many of these sites are "pure Unix" type places (or like to think that they are) and don't support such radical ideas as having a mail address "postmaster" or anything like that. Mail to "root" is usually the best that you can hope. (Of course, some of them aren't Unix at all, and have no "root", and often no "postmaster" either. Never mind.)

First here is a list of nodes reachable from us that are in our statefile. There will be more that we don't know about, that are in some domain that we can get to. There is a list of the known domains at the bottom of this.

This is a bit of a mess, as lots of nodes (including some here) are still running old code, which doesn't send complete info to us (or anyone). Its also not very prettily formatted, in my opinion...

The name at the left margin is the node name. The list in braces following it is its domain hierarchy, so, taking the first node in the list, "ahec" - its full name is "ahec.ahec.oz". Old nodes used not to supply that information to us (eg, see "amc45") and it needs to be "guessed at". The hierarchy should always end in "oz", that used not to be the case, and some old nodes still don't show that (usually minor ones). But it is true nevertheless.

The first name in the brackets indicates the "primary" domain of the node. Eg, for "ahec" it is "oz". That means that ahec can be properly addressed as "ahec.oz". On the other hand, "basser40" has "su" as its primary, so while its full name is "basser40.cs.su.oz" that can be abbreviated to "basser40.su.oz". Sim, "amc45" has "ahec" as its primary, so its name is "amc45.ahec.oz". (This is one of the cases where you have to get the "oz" from other knowledge).

Nodes that don't supply this list of names are running VERY old code (before domains existed) and are all implicitly just in "oz". Finally, everything in this list (because it is in the

list) can be addressed as if its name were "host.oz" regardless of whether that's what its name really is or not. Other domains listed in brackets indicate the amount of information that the node keeps in its statefile (ie, which nodes are directly addressible from it) and aren't immediately relevant. Ignore "acsnet", it has nothing to do with anything (and never occurs in a hierarchy - or shouldn't).

Words in parentheses relate to issues not pertinent to anything material here.

The second line, when there is one, for each node, gives some human-useful indication as to what the node is, or at least, that is the intention.

Finally, note that this info changes all the time, I wouldn't recommend that you use it in anything that is purported to be up to date and accurate. In particular, all of UNSW is still running the oldest code at the minute (they account for most of the nodes that have no domains or description listed below) but is scheduled to upgrade at the end of June, or early in July - quite likely many of their node names will change then. (They are most of the dumb ones "elec35", "elecvox", "cadvax", ..)

```

aaec          {aaec.oz} [oz|acsnet|aaec]
              "Aust. Atomic Energy Comm. Pyramid 90x."
agsm
amc45        {aaec}
anucsd       {cs.anu.oz} [oz|acsnet|anu]
              "ANU Computer Science Sun-68K (2Mb)"
aragorn      {cm.deakin.oz} [oz|deakin|cm|acsnet] (conterm)
              "Deakin Uni. Comp/Maths. Gould PN6031"
archsci      {su|acsnet|oz}
basser       {cs.su.oz} [oz|su|basser|acsnet]
              "Sydney Uni. Basser Research VAX-11/780"
basser40     {cs.su.oz} [su|acsnet|basser|oz]
              "Sydney Uni. Basser Research PDP-11/40"
basset       {cs.su.oz} [oz|acsnet|basser|su]
              "Sydney Uni. Basser Teaching VAX-11/780"
bio23
cadvax       {oz} (foreign)
cglvax
charlie      {cc.deakin.oz} [oz|deakin|cc|acsnet]
              (conterm,msgterm) "Deakin Uni. Comp/Centre Gould 6080"
chemeng      {ce.su.oz} [su|ce|oz]
              "Sydney Uni. Chemical Engineering PDP 11/60"
civil
comm34
comm40
csadfa       {cs.adfa.oz} [oz|adfa|acsnet|canberra|pyramid|cs]
              "Aust. Defence Force Academy, Dept Computer
              Science, Pyramid 90x"
csb44
cscunix      [anu|csc]

```



```

csu40          [oz]
csu60
csuvx0
csuvx1
csuvx2
diglec
dmsadel       {csiro.oz} [oz|acsnet|csiro] (conterm)
              "CSIRO Divn Maths & Stats, Adelaide (PDP11/34)"
dmSCANb       {csiro.oz} [oz|acsnet|csiro]
              "CSIRO Div Maths & Stats, Canberra (VAX 750)"
dmsgeo        {dmsmelb.csiro.oz} [oz|acsnet|csiro|dmsmelb]
              "CSIRO dms (Geostats), Melbourne Australia."
dmsmelb       {dmsmelb.csiro.oz} [oz|acsnet|csiro|dmsmelb]
              "CSIRO dms, Melbourne (Clayton) Australia."
dmsperth      [oz|acsnet|csiro]
dmt-hp9k
dmtadel
dmtmelb       [oz]
dmtunison
dmtvax
dmtvlsi
dsl
dual          [oz]
ecstats       [su|oz]
eefcyber
elec
elec35
elec40
elec70
elec70a
elec70b
elecadel      {eleceng.au.oz} [oz|eleceng|au|acsnet]
              "Adelaide Uni. Electrical & Electronic Eng.,
              PDP-11/34"
elecvox       [oz]
elprobe       [uq|minmet]
emu           [oz|techway|elxsi|rmit|cs] (conterm,msgterm)
facet         {ee.su.oz} [ee|su] (conterm,msgterm,foreign)
              "Engineering Faculty and Electrical Teaching
              VAX-11/780's"

fairlight
flinders      {flinders.oz} [oz|acsnet|flinders]
              "Flinders University Computer Science"

food23
goanna        {cs.rmit.oz} [oz|rmit|acsnet]
              "Royal Melbourne Institute Of Technology"
gollum        [deakin|cm] (conterm,msgterm)
gucis         {gucis.gu.oz} [oz|gu|gucis|acsnet] (conterm)
              "Griffith University, Computer Information Studies
              (VAX 11/750)"

ibm           [aaec] (conterm,msgterm,foreign)
idris         [aaec] (conterm,msgterm)
iona         {ips.oz} [oz|acsnet|ips] (conterm,msgterm)
              "Ionospheric Prediction Service 11/23"
ipso         {ips.oz} [oz|acsnet|ips]

```

```

"Ionospheric Prediction Service Vax 11/750"
ipspc
karri      [oz]
kooka      [to] (conterm,msgterm)
latcs1     [oz|acsnet] (conterm,msgterm)
           "La Trobe Uni., Computer Science, Pyramid 90x"
           (conterm)
ltupsych23
mathvax
mech
mechadel   [mecheng.au.oz] [oz|mecheng|au|acsnet]
           (conterm,msgterm)
           "Adelaide Uni. Mechanical Engineering. PDP 11/34"
metro      {ucc.su.oz} [oz|su|ucc|acsnet]
           "Sydney Uni. Computing Centre VAX-11/750"
mhd        [su|ee|oz|acsnet]
           "S.U.E.E MHD research 11/34"
moncsbruce {monash.oz} [oz|acsnet|monash] (conterm)
           "Monash Uni. C.S. Pyramid 90x"
moncskermit {cc.monash.oz} [oz|monash|acsnet|cc]
           "Monash Uni. C.S. Vax-11/750"
moneevax   {monash.oz} [oz|monash|acsnet]
           "Monash Uni. Elec.Eng. Vax-11/750"
           (conterm)
monpeme
monu1      {monash.oz} [oz|monash]
           "Monash Uni. Comp.Cent. Pyr-90x"
monu3      {monash.oz} [oz|monash]
           "Monash Uni. Pyr-90x "
monvax1    [cc|monash]
morris     {neology.oz} [neology|oz]
           "Neology Ltd. ICL Clan 68010"
mqmath     [oz|mq]
mudlo      {cc.mu.oz} [oz|acsnet|elxsi|mu|cc]
           "Melb Uni Comp Centre - Elxsi Dual processor"
mugana     [cs]
           "Melb Uni Comp Sci - Teaching Unison"
mulga      {cs.mu.oz} [oz|mu|cs|acsnet]
           "Melbourne Uni, Computer Science: PE 3240"
mullian    {ee.mu.oz} [oz|mu|ee]
           "Melb. Uni. Elec. Eng. Gould PN6031"
mulwala    [cs]
           "Melb Uni Comp Sci - Teaching Unison"
mummjeeli {cs.mu.oz} [cs]
           "Melb Uni Comp Sci - Teaching Unison"
mundara    {cs.mu} [cs|mu]
           "University of Melb, SDG Machine"
mungunni   {cs.mu.oz} [oz|cs|mu|acsnet]
           "Melb Uni, Comp Sci, Machine Intelligence Grp,
           Pyramid 90x"
munker     {cs.mu} [cs|mu]
           "Melb Uni Comp Sci - Experimental Unison"
munnari    {cs.mu.oz} [oz|cs|mu|acsnet]
           "Melb Uni - Comp Sci / Met (11/780)"
murdu      {cc.mu.oz} [oz|mu|cc]
           "Melb Uni - Comp Centre (11/750)"
muwe       [cs]

```

```

natmlab      {natmlab.csiro.oz} [oz|acsnet|csiro|natmlab]
              "CSIRO dms & dap, National Measurement Lab
              (Vax11/750)"
neat         {fawnray|oz} (conterm,msgterm)
neology     {neology.oz} [oz|neology|fawnray]
              "Neology Ltd. R+D, Gould SEL 32/67 4.2BSD"
newt        [neology|oz]
nrc         "Neurobiology Research Centre, University of Sydney"
nswitgould  [oz|nswitcs|nswit]
osiris      [oz|acsnet|osiris]
perq
physiol     {physiol.su.oz} [su|physiol|acsnet|oz]
              "Physiology Department, University of Sydney, PDP 11/44"
prance      {fawnray.oz} [oz|fawnray|acsnet]
              "Fawnray-Prance Ltd. Melbourne unity 68k"
psych       [uq|oz|acsnet|psych]
psych44     {psych.su.oz} [su|psych|oz]
              "Psychology Department Research PDP 11/44"
qdpi
qfdts       {qfd.oz} [oz|acsnet|qfd]
              "Queensland Dept of Forestry Research Branch VAX 750"
rcm750
runx        {ips.oz} [oz|acsnet|ips]
              "Remote Unix Timeshare 11/23"
siromath    {siromath.csiro.oz} [oz|acsnet|csiro|siromath]
              "Siromath Pty. Ltd., 31 Market St., Sydney (Vax 11/750)"
sis         [aaec] (conterm,msgterm)
sri         {sri.csiro.oz} [oz|acsnet|csiro|sri]
              "Sugar Research Institute, Nebo Road, Mackay Qld
              (Vax750)"
srl
sueeise     {ee.su.oz} [su|ee|acsnet]
              "Imaging Sciences and Engineering 11/23"
syscon
taminick    {neology.oz} [oz|neology|fawnray]
              "Neology Ltd administration, 68K DE UNITY"
tasis       {tasis.utas.oz} [oz|acsnet|tasis|utas]
              "Uni of Tasmania, Inf Sci Dept, VAX-11/750"
tictoc      {to.oz} [oz|acsnet|acema|to]
              "TIME. Office Computers R&D VAX-11/750"
trlamct     {amct.trl.oz} [oz|trl|amct|acsnet]
              "App. Maths & Computer Techs. Sun 2/120
              Telecom Research"
trldeity    {tms.trl.oz} [oz|trl|tms] (conterm)
              "Telecom Research Labs, Telematic and Message Svcs."
trlsasb     [oz|trl] (conterm,msgterm,foreign)
trlvlsi     {amct.trl} [amct|trl]
              "VLSI Investigations, App. Math & Comp. Techs,
              Telecom Research"
uacomsci    [oz|acsnet|au] (conterm,msgterm,foreign)
ucc         {ucc.su.oz} [su|ucc|oz]
              "Sydney Uni. Computing Centre PDP-11/24"
uccgraphics [oz|su|ucc|acsnet]
unswpower
uowcsa      {cs.uow.oz} [oz|acsnet|uow]

```

```

uq          "Uni. of Wollongong Comp Sci PE3230, V7, Teaching"
           {cs.uq.oz} [oz|uq|acsnet]
uqcspe     "Queensland Uni Computer Science Network PDP 11/34"
           {cs.uq.oz} [oz|uq|acsnet]
uqutx1     "Queensland Uni Computer Science Research PE 3250"
           {pcc.uq} [uq|pcc|acsnet] (conterm,msgterm)
wacsvax    "Queensland Uni Prentice Computer Centre VAX 750"
           {cs.uwa.oz} [oz|uwa] (msgterm)
wapsyvox   "Uni. W.A. Computer Science VAX 11/750"
           (msgterm)
wavls1
zaphod
zen        [natmlab|csiro|acsnet|oz] (conterm,msgterm)

```

The rest of this is next to useless. It is simply a list of domain names that exist. Some of these are sub-domains of "oz" (though "oz" itself is here too), others are sub-domains of the first level sub-domains. There's no easy way (other than inspection of the above list) to tell which is which. That's just the way things are. The sub-sub-domains aren't unique, eg "cs" exists as a sub-domain of "mu.oz", "su.oz", and "uow.oz", and possibly others.

aaec	acema	acsnet	adfa	amct	anu	au
basser	canberra	cc	ce	cm	cs	csc
csiro	deakin	dmsmelb	ee	eleceng	elxsi	fawnray
flinders	gu	gucis	ips	mecheng	minmet	monash
mq	mu	natmlab	neology	nswit	nswitcs	osiris
oz	pcc	physiol	psych	pyramid	qfd	rmit
siromath	sri	su	tasis	techway	tms	to
trl	ucc	uow	uq	utas	uwa	

I hope that this is of some use to you, for something.

Robert

```

=====
From: munnari!basser.oz!bob@seismo.CSS.GOV
Date: Thu, 7 Nov 85 09:39:34 EST
To: mse%Phobos@CIT-HAMLET.ARPA
In-Reply-To: Your message of 6 Nov 1985 1939 (Wednesday).

```

... The software was developed at the University of Sydney by Piers Dick-Lauder and myself (Bob Kummerfeld). It runs on any flavour of Unix/machine. It uses any available virtual circuit to connect machines. It does implicit, dynamic routing and lots of other good things.

There are over 100 machines all over Australia on it.

Bob.

```

=====
Date: 08 Nov 85 08:14:26 +1100 (Fri)

```

To: mse%Phobos@cit-hamlet.arpa
 Subject: Re: mso - query
 From: Robert Elz <munari!kre@seismo.CSS.GOV>

I saw the copy of that thing I sent to the CSNET people in June, brought back terrible memories... Its rather out of date now though, 4 months is a long time in network evolution. I may send CSNET a more up to date version, but I'm not really sure its worth the bother, it won't remain current any longer than that one did.

To answer your questions ... As far as I know "mso.anu" is still connected, and yes, ACSnet certainly will return messages that are undeliverable (or at least, it will try to).

There are several CSIRO divisions connected to the network already. The primary requirement is a UNIX system, of some kind or other to run the code on. We do have isolated connections to non-unix sites, but they are rather a strain to maintain (most of the ANU sites are like that).

Robert

```
=====
Date: Fri, 8 Nov 85 09:01:26 EST
From: bob%basser.oz@CSNET-RELAY.ARPA
To: mse%Phobos%cit-hamlet.arpa%CSNET-RELAY.csnet%munari.oz
    @CSNET-RELAY.ARPA
In-Reply-To: Your message of 8 Nov 1985 0755 (Friday).
```

If the people at epping have a unix system that has a dialout line or access to CSIRONET or AUSTPAC then they can easily join the net. They should send me a letter asking for the software and I'll send a licence agreement. There is small licence fee to cover costs. My address is:

Dr R.J.Kummerfeld
 Dept. of Computer Science,
 University of Sydney 2006

```
=====
Date: 08 Nov 85 15:09:09 +1100 (Fri)
To: mse%Phobos@CIT-Hamlet.ARPA
Subject: Re: ACSnet vs astronomers
In-Reply-To: Your message of Thu, 7 Nov 85 14:50:55 PST.
    <851107144728.00m@Phobos>
From: Robert Elz <munari!kre@seismo.CSS.GOV>
```

```
>Date: Thu, 7 Nov 85 14:50:55 PST
>From: mse%Phobos@CIT-Hamlet.ARPA
>
```

```
>Do you use TCP/IP, or some other protocol? I wonder if we have
>any software around here that might be useful.
```

not very likely I suspect.

we use tcp/ip internally, but there are no long haul nets anywhere in australia that use it.

we use csironet as a transport mechanism, but its performance and quality (at the level we get access to it) is too hopeless to think of running anything like SMTP over it. And its not nearly quick enough to put IP on top of (for example, we have a 1200 baud line to csironet - which actually goes through one of the csiro divisions first).

There is a locally developed csironet access protocol, which is pretty primitive, and really just alows us to connect to a host on csironet as if we were a terminal.

The programs we use for the network mostly are something like uucp (well, not really - but they are designed to operate in a similar enviroment - slow lines with no error detection). There have occasionally been people think of porting it to VMS, but they never get far, its a fairly unix dependant set of programs.

There is a vms interface in existance (developed at anu), but its not fantastic, and attempting to use it over csironet would probably be a bit of a disaster. We are soon going to use it over austpac (australia's public packet switched network) which is much more reliable, and faster, and even there I don't expect performance will be very good.

Best chance for something in the future may be a linkup between our net & the csironet mail system, but I cannot see that happening in the very near future.

Sorry to not be able to give you better news.

Robert

=====

DISTRIBUTION:

P. Rayner
A. Hunt
R. Wand
W. Wilson
J. Brooks
R. Frater