mark bixby
hp csy r&d lab
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getting started with
sendmail on mpe/ix 7.5
product overview

Major functionality:
• send SMTP e-mail
• receive SMTP e-mail to local mailboxes, programs, or files
• aliases can be created which map to local mailboxes, programs, files, or remote mailboxes
• powerfully flexible configuration language

Built from:
• Sendmail 8.12.1
• Sleepycat Berkeley DB library 3.3.11
system requirements

• will be released as a 7.0 patch
• will ship in 7.5 FOS
• requires TZ environment variable to be set correctly, preferably in the system logon UDC
• requires a local syslog daemon, either MPE FOS Syslog/iX or embedded spooling ISV syslog daemon
• the local e3000 must be configured correctly for DNS and must be listed correctly in the DNS database
• firewalls or other security devices must allow the local e3000 to make DNS connections (port 53) and SMTP connections (port 25)
• Sendmail A.01.00 for MPE/iX will be fully supported by RC and WTEC

• Customers who call with questions regarding unsupported bixby.org freeware Sendmail 8.9.1 will be encouraged to upgrade to Sendmail A.01.00
distribution highlights

• Apache-like VUFF -- CURRENT -- PUB file layout

• /SENDMAIL/PUB/JDAEMON – batch job for running the server daemon

• /SENDMAIL/PUB/SENDMAIL – symlink to /SENDMAIL/CURRENT/SENDMAIL

• /SENDMAIL/CURRENT/SENDMAIL – combined server daemon and local mail submission program

• /SENDMAIL/CURRENT/bin – dnscheck, hoststat, m4, mailq, newaliases, purgestat, vacation

• /SENDMAIL/CURRENT/sbin – editmap, mailstats, makemap, praliases, sendmail, smrsh
distribution highlights (cont.)

- `/SENDMAIL/CURRENT/cf` – directory tree for building *.cf config files; see the README file!


- `/SENDMAIL/CURRENT/etc` – contains the POSIX shell profile for Sendmail along with the sample config files installed to `/etc/mail`

- `/SENDMAIL/CURRENT/man` – man page documentation, I.e.:
  ```
  export MANPATH=/SENDMAIL/CURRENT/man
  :$MANPATH
  
  man sendmail
  ```
hpux compatibility
symbolic links

/usr/bin/m4
/usr/bin/mailq
/usr/bin/mailstats
/usr/bin/newaliases
/usr/bin/praliases
/usr/bin/vacation
/usr/lib/sendmail
/usr/sbin/editmap
/usr/sbin/hoststat
/usr/sbin/mailstats
/usr/sbin/makemap
/usr/sbin/newaliases
/usr/sbin/purgestat
/usr/sbin/sendmail
/usr/sbin/smrsh
config files

• all config files live in /etc/mail which is populated from /SENDMAIL/CURRENT/etc/mail.sample at installation time if the /etc/mail files do not already exist

• all config files must be owned by the user SERVER.SENDMAIL and the POSIX group SENDMAIL

• the server daemon must be stopped and restarted for config file changes to take effect

• sendmail.cf (mail server), submit.cf (mail submission) and aliases are the most important ones
configuring *.cf files

- submit.cf and sendmail.cf are created from macro files expanded by the m4 utility
- you can edit submit.cf and sendmail.cf directly to make MINOR parameter changes:
  
  ```
  # "Smart" relay host
  DSmy.relay.host.name
  ```

  - major functionality changes REQUIRE you to edit the macro files and expand with m4

  - so just play it safe and ALWAYS edit the macro files and expand with m4 for ALL changes:

    ```
    define(`SMART_HOST',
    `my.relay.host.name')
    ```

- see

  `/SENDMAIL/CURRENT/cf/READEME` for the list of major *.cf options
configuring *.cf files (sendmail.cf for the mail server program)

To generate sendmail.cf:

1. :HELLO SERVER.SENDMAIL
2. :XEQ SH.HPBIN.SYS -L
3. shell/iX> cd /SENDMAIL/CURRENT/cf/cf
4. shell/iX> cp generic-mpeix.mc.sample generic-mpeix.mc
5. edit generic-mpeix.mc with the bytestream file editor (i.e. vi) of your choice to make your changes
6. shell/iX> m4 ../m4/cf.m4 generic-mpeix.mc >generic-mpeix.cf
7. shell/iX> cp generic-mpeix.cf /etc/mail/sendmail.cf
configuring *.cf files
(generic-mpeix.mc.sample)

OSTYPE(mpeix)dnl
DOMAIN(generic)dnl
define(`confFORWARD_PATH',
`$z/./.forward')dnl
FEATURE(masquerade_envelope)dnl
FEATURE(domaintable)dnl
FEATURE(mailertable)dnl
FEATURE(genericstable)dnl
FEATURE(virtusertable)dnl
FEATURE(always_add_domain)dnl
FEATURE(access_db)dnl
MAILER(local)dnl
MAILER(smtp)dnl
configuring database map files

- typically used by optional sendmail features like access_db
- Berkeley DB database hash or btree files containing extra configuration data in key/value pairs
- maintained with the makemap and editmap utilities
- by convention, a map file named “foo” contains the ASCII input data, whereas “foo.db” contains the compiled binary database structures
- in commands and *.cf files, a map file reference of “foo” actually refers to “foo.db”!
configuring database map files (cont.)

MPETEST:/BIXBY/PUB> cat - >foo
key1 value1
two abcdef
abra cadabra :eod

MPETEST:/BIXBY/PUB> makemap hash foo <foo

MPETEST:/BIXBY/PUB> ls -l foo*
-rw-r--r-- 1 MGR.BIXBY BIXBY 36 Feb 25 13:52 foo
-rw-r--r-- 1 MGR.BIXBY BIXBY 49152 Feb 25 13:52 foo.db

MPETEST:/BIXBY/PUB> makemap -u hash foo
key1 value1
two abcdef
abra cadabra
common non-default config changes

• defining a smart relay host in sendmail.cf to route all outbound email via a single mail gateway
• define alternate routing for certain outbound mail domains via the mailertable feature
• creating aliases for inbound email instead of using the basic USER.ACCT@host.name mailboxes
aliases database map

• a special type of map file containing one or more comma-delimited values per key
• /etc/mail/aliases and aliases.db
• maintained by SERVER.SENDMAIL with the newaliases and praliases commands
• defines username aliases for mail being delivered to the local machine, i.e. postmaster@local.host.name
• installation default entries:

postmaster: SERVER.SENDMAIL
MAILER-DAEMON: postmaster
aliases database map (cont.)

- left-hand side is the user alias
- separated by a colon
- right-hand side is one or more delivery destinations:
  - USER.ACCOUNT or user@host.name or another alias
  - /path/to/local/file for appending
  - :include: /file/of/aliases (plaintext ASCII file)
  - "|/program/file parm1 parm2 parm3 ...
- local usernames may be escaped with a backslash (I.e. \USER.ACCOUNT) to prevent recursive alias lookups
The .forward files

• an optional ASCII file named .forward residing in the local user’s home group which tells sendmail where to forward the user’s mail.

• format is the same as the right-hand side of an aliases entry, I.e. one or more comma-separated destinations

• can be used to invoke the vacation autoresponder:

```
\USER.ACCOUNT, "|/SENDMAIL/CURRENT/bin/vacation USER.ACCOUNT"
```
access_db feature – accept or reject incoming e-mail based on envelope address or relaying mail server name

1. :HELLO SERVER.SENDMAIL
2. :XEQ SH.HPBIN.SYS –L
3. /bin/cat – >/etc/mail/access
   imas spammer.com REJECT
   :EOD
4. makemap hash /etc/mail/access
   </etc/mail/access
domaintable feature – rewrite domain names in e-mail headers

1. :HELLO SERVER.SENDMAIL
2. :XEQ SH.HPBIN.SYS -L
3. /bin/cat -
   >/etc/mail/domaintable
   oldcompany.com newcompany.com
   :EOD
4. makemap hash
   /etc/mail/domaintable
   </etc/mail/domaintable
genericstable feature – rewrite user and/or domain addresses in outgoing e-mail headers

1. :HELLO SERVER.SENDMAIL
2. :XEQ SH.HPBIN.SYS –L
3. /bin/cat –
   >/etc/mail/genericstable
   USER_ACCOUNT@my.local.host
   customer_service@company.com
   :EOD
4. makemap hash
   /etc/mail/genericstable
   </etc/mail/genericstable

Note that domains being modified by genericstable must be added to /etc/mail/sendmail.cf class {G}. 
mailertable feature – override default mail routing in sendmail.cf

1. `:HELLO SERVER.SENDMAIL`
2. `:XEQ SH.HPBIN.SYS -L`
3. `/bin/cat -` 
   `>/etc/mail/mailertable` 
   `.bitnet smtp:relay.bit.net` 
   `:EOD`
4. `makemap hash` 
   `/etc/mail/mailertable` 
   `</etc/mail/mailertable`
virtusertable feature – remap incoming user and hostnames to local users

1. :HELLO SERVER.SENDMAIL
2. :XEQ SH.HPBIN.SYS -L
3. /bin/cat -
   >/etc/mail/virtusertable
   info@bar.com INFO.BAR
   info@foo.com INFO.FOO
   :EOD
4. makemap hash
   /etc/mail/virtusertable
</etc/mail/virtusertable

Note that virtual hostnames must be listed in /etc/mail/local-hostnames.
starting the mail daemon

• Make sure a syslog daemon is running before you start the mail daemon!

• To start the MPE FOS syslog daemon, :STREAM JSYSLOGD.PUB.SYSLOG

• To start the mail daemon, :STREAM JDAEMON.PUB.SENDMAIL
stopping the mail daemon

• Use the POSIX kill signal from SERVER.SENDMAIL or any user with SM capability:

```
kill $(head -n 1 /etc/mail/sendmail.pid)
```

• Only use `:ABORTJOB` as a last resort!
sending e-mail with mailx

• interactively:

```
mailx someuser@some.host
Subject: hello world
Hi,

How are you doing?
:EOD
EOT
```

• from a pipe:

```
echo "How are you doing?" |
mailx -s "hello world"
someuser@some.host
```

• from a disk file:

```
mailx -s "hello world"
someuser@some.host
</diskfile/containing/msg/body
```

• no attachments!

• limited control of mail headers!
1. `/bin/cat` -> `message.txt`  
   To: someuser@some.host  
   Cc: otheruser@other.host  
   Bcc: secretuser@another.host  
   Subject: hello world  

   Hi there!  
   :EOD  

2. `/SENDMAIL/CURRENT/SENDMAIL` -t `<message.txt`  
   
   • the `-t` option reads the destination addresses from the message headers  
   
   • destination addresses can alternatively be specified on the SENDMAIL command line  
   
   • if you want attachments you must generate the MIME headers yourself
sending e-mail with forged headers

1. `/bin/cat - > message.txt
   From: forger@foobar.com
   To: someuser@some.host
   Cc: otheruser@other.host
   Bcc: secretuser@another.host
   Subject: hello world

   Hi there!
   :EOD

2. `/SENDMAIL/CURRENT/SENDMAIL -t
   -f forger@foobar.com
   <message.txt

   • the `-f` option sets the message envelope address, but a warning header is included:

   X-Authentication-Warning:
   local.e3000.host: USER.ACCT
   set sender to
   forger@foobar.com using `-f`

   • genericstable and other options can forge without traces
receiving e-mail with mailx

• invoke /bin/mailx with no parameters, and it will read e-mail from /usr/mail/USER.ACCOUNT

• a numbered headers summary is printed; refer to these numbers in mailx commands

• type nnnn – display a message

• delete nnnn – delete a message

• help – for further details

• quit – exits after updating the mailbox

• see “man mailx” or the Shell & Utilities manual for further details
receiving e-mail programmatically

- incoming e-mail will be delivered to programs specified in the aliases database or .forward files.
- the e-mail will be delivered to the program via a POSIX pipe connected to the program’s stdin.
- the POSIX newline character \n (ASCII LF) is used as a record separator.
- if the program terminates with a non-zero POSIX exit status, any info written to stderr will be returned in a bounce message.
migrating from freeware 8.9.1

• must create new JDAEMON from /SENDMAIL/CURRENT/JDAEMON.sample
• all config files reside in /etc/mail instead of /SENDMAIL/PUB/etc
• 8.9.1 sendmail.cf is NOT compatible with 8.12.1
• copy all 8.9.1 ASCII map files to /etc/mail and rebuild with makemap and newaliases
• 8.9.1 queued messages won’t be seen by 8.12.1
• 8.12.1 uses two queues (/var/spool/clientmqueue and mqueue) instead of 8.9.1’s /SENDMAIL/PUB/mqueue
migrating from freeware 8.9.1 (cont.)

- 8.9.1 would submit new messages directly to the queue disk files, but 8.12.1 speaks SMTP to localhost port 25
- 8.12.1 uses two main config files, /etc/mail/submit.cf for submitting new messages, and sendmail.cf for general mail routing
- 8.12.1 does not include the Majordomo mailing list software that was bundled with 8.9.1. HP does not support Majordomo!
mpe/ix implementation issues
(things that work differently)

• Sendmail programs don’t read stdin terminal keyboard input correctly. Workarounds:
  - `/bin/cat - | makemap hash mymap`
  - `makemap hash mymap <diskfile`

• DeliveryMode=background on MPE is a hybrid between “background” and “interactive”

• Symlinks invoke different personalities of SENDMAIL (i.e. mailq, newaliases, etc), and these only work properly from the POSIX shell because the CI doesn’t initialize ARGV[0]

• newaliases gives a “cannot change ownership” warning which can be ignored
dns issues

• the #1 sendmail problem!
• before using sendmail, run the dnscheck script:
  1. :HELLO SERVER.SENDMAIL
  2. :XEQ SH.HPBIN.SYS –L
  3. /SENDMAIL/CURRENT/bin/dnscheck
• make any recommended config changes and then rerun the script until success is reported
• see speaker notes for sample dnscheck output
dns issues
(cont.)

- single-token hostname? I.e. `uname -n` returns “jazz”?
- domain name in `/SYS.NET/RESLVCNF`? I.e. “domain external.hp.com”?
- one or more nameserver entries in RESELVCNF?
- fully-qualified domain name has a DNS “A” record specifying the IP address of the local machine?
- IP address has a DNS “PTR” record specifying the fully-qualified domain name?
- if no to any of the above, sendmail may hang, refuse to start, be unable to recognize the local host, and generally fill up syslog with interesting msgs
firewall issues

• the #2 sendmail problem!
• your 3000 needs to query port 53 on DNS servers to resolve the destination mail server hostname
• your 3000 needs to receive DNS query answers
• your 3000 listens on its port 25 for incoming e-mail
• your 3000 needs to connect to port 25 on destination mail servers
• does your firewall allow your 3000 to talk to the Internet?
• does your firewall allow the Internet to talk to your 3000?
• firewall blocking results in connection refused, timeouts, or just no activity!
troubleshooting

• check syslog first!

• if nothing in syslog:
  – if your third-party spooling package has an embedded syslog daemon, you will probably need to use that one instead of Syslog/iX
  – is the syslog daemon running?
  – does the syslog daemon have read access to the config file and write access to the log file?
  – is syslog configured to log mail events?

• if syslog or e-mail message headers show strange timestamps, verify TZ is set properly, preferably in your system logon UDC
• if syslog shows DNS lookup failures:
  – run the dnscheck script to verify DNS is configured properly
  – verify that your firewall allows your 3000 to talk to DNS servers on port 53
• if syslog shows connection failures to remote mail servers, verify that your firewall allows your 3000 to connect to port 25; if it does not, you may need to configure sendmail.cf to use a smart host mail relay
• long delays submitting new messages are indicative of DNS problems; check syslog and run the dnscheck script
if local users are submitting messages that aren’t being delivered:

- verify that JDAEMON is running; if it is not, messages will be queued in /var/spool/clientmqueue
- transient network problems may cause a backlog in the mail daemon queue /var/spool/mqueue; run /SENDMAIL/CURRENT/bin/mailq as SERVER.SENDMAIL to get a formatted queue listing
troubleshooting (cont.)

• if remote users are sending messages that aren’t being delivered to the local 3000:
  – check syslog for remote connection attempts; if there are none, does your firewall allow connections to port 25 on your 3000, and are your 3000’s DNS entries visible to the remote users?
  – verify that the remote users are using valid e-mail addresses for your 3000, i.e. USER.ACCOUNT or an alias, plus the correct hostname
• if a sendmail config change doesn’t appear to take effect:
  – stop and restart the mail daemon when making *.cf changes
  – if you changed an ASCII database map file, don’t forget to run makemap or editmap to compile the binary *.db file
  – if you changed ASCII /etc/mail/aliases, don’t forget to run newaliases to compile the binary /etc/mail/aliases.db file
for further information

• 7.5 Communicator
• 7.5 Configuring & Managing MPE/iX Internet Services
  • http://jazz.external.hp.com/src/sendmail/
  • http://www.sendmail.org/
  • http://www.sleepycat.com/ for the Berkeley DB database used for map files
join the hp3000-L community!

• Available as a mailing list and as the Usenet newsgroup comp.sys.hp.mpe
• In-depth discussions of all things HP e3000
• Talk with other people using Sendmail on MPE
  • seek advice, exchange tips & techniques
• Keep up with the latest HP e3000 news
• Interact with CSY
• http://jazz.external.hp.com/papers/hp3000-info.html