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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 all the local e3000 to make DNS connections (port 53) and SMTP connections (port 25)

support

- 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 VUUFF -- 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/doc/op/op.ps – Sendmail Installation and Operation Guide – READ IT!

- •/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/README 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 e-mail via a single mail gateway

- define alternate routing for certain outbound mail domains via the mailertable feature

- creating aliases for inbound e-mail 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

.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`
   `imaspammer.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_servce@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-host-names.

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!

sending e-mail with SENDMAIL

```
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 RESLVCNF?

- 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

troubleshooting (cont.)

- 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

troubleshooting (cont.)

- 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

troubleshooting (cont.)

- 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