

# EXIM MTA Tutorial

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Debian GNU/LINUX MTA sendmail exim System  
Administrator . exim ,  
가 .

0.1

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Exim Debian GNU/LINUX MTA MTA  
 Debian GNU/LINUX sendmail qmail 가 (全無)  
 가 . Exim  
 가 . [1]

Exim System Administrator Exim sendmail  
 Exim GNU/Linux FreeBSD, Solaris,  
 Mac OS X 가 . Site Exim  
 . Exim Site , Mail 가 , Site .

Exim  
 Exim Exim Exim [Exim](#)  
 . Exim (4.x)  
 (3.x) Exim 가 [o'reilly](#) [exim](#) . [2]

Exim [Mailing List](#) 가 Exim 가 .

Exim [debianusers.org](#) , Exim  
 , Mail Service 가 service  
 . [3]

. [4]

MTA Exim Philip Hazel .

[1] Debian GNU/LINUX Woody exim(-tls) 3.35-1 . Mail Server  
 DNS Network System Administrator

[2] o'reilly exim .

[3] Exim4 가 [Exim](#) , Debian GNU/LINUX Sarge Sid Exim4  
 Package 가 . Exim4 Exim3 Sarge 가  
 Stable Exim4 가 Debian GNU/LINUX MTA 가  
 가 Exim4 가 Exim3 Exim3

Exim4

가

. —. —;

[4]

Mail

가

[Debianusers](#)

가

# 1 . Exim

Unix System Mail Server sendmail, qmail Exim

Exim Unix Systems Mail Server, sendmail Program , GPL(General Public License) Open-Source Software . Exim GNU/Linux Unix System MTA . Mail Server, MTA TCP/IP SMTP(Simple Mail Transfer Protocol) Remote Host Message , Local Remote Host Message .

:

## 1-1. Mail

MUA(Mail User Agent)	Mail Client
MTA(Mail Transfer Agent)	Mail Server
MDA(Mail Delivery Agent)	Mail Filtering Mail Client Mail

Exim , 가 .  
 Exim ,  
 Section . Section Keyword/value ,  
 Data NIS, NIS+, LDAP,  
 MySQL PostgreSQL . , [RBL\(Realtime Blackhole List\) \[1\]](#) Online List

: RBL . Spam Mail RBL  
 가 . Site(Kornet, Hanaro, Orgio,  
 Hitel...) Mail 가 .  
 : Internet . Internet ,  
 가 , , Spam  
 Mail , Spam Mail 가 가 , Spam  
 Mail . Site Spam Mail  
 Filtering , Site "kr" Domain IP

Exim Incoming Message .

- Incoming Message Size .
- SMTP System Administrator 가 Host Network .
- Incoming Message Sender, RBL List Domain, Sender Message Block.
- Spam Mail Relay , Relay Host Network .
- SMTP Mechanism Relay 가 Client .

, End User Mail . .forward

Exim Filter , End User Mail

. Filter File Mail Message Header Content ,

, File, Pipe 가 . Filter End User

System Administrator 가 Mail Message , System Filter

MTA , Exim /usr/sbin/sendmail /usr/lib/sendmail sendmail Commandline

Interface sendmail Commandline Option . [\[2\]](#)

Queue Message Exim Commandline Option 가 , Eximon

X Window Queue Monitoring 가 .

Exim , Message Body [\[3\]](#)

. , Message Body .

: **RFC 1891** .

[\[1\]](#) Spammer System Administrator 가

가 . Spammer Online List

, RBL .

[\[2\]](#) Sendmail Commandline Interface Program Mail Sendmail Command

[\[3\]](#) eximon Message Body 가 .

## 2 . Internet Mail

- 2.1. [MTA](#)
- 2.2. [Mail Message\(RFC-822 Message \)](#)
- 2.3. [e-mail Address](#)
- 2.4. [Mail 가? \(Host Message \)](#)
- 2.5. [SMTP](#)
- 2.6. [Mail Routing 가? \(Message Routing\)](#)
- 2.7. [Incoming](#)
- 2.8. [DNS](#)
- 2.9. [Mail Routing DNS record \(MX Record\)](#)
- 2.10. [DNS Record](#)
- 2.11. [DNS](#)
- 2.12. [postmaster](#)
- 2.13.
- 2.14.

Web Service , Internet 가 Service ? e-  
mail Service 가 End User  
(Spam Mail, Junk Mail .) 가 . End  
User e-mail , Spam  
Mail Mail Box , System Administrator  
System Administrator , e-mail Service 가  
Administrator 가 가 e-mail  
(Guylhem Aznar)가 'Electronic Mail HOWTO'  
RFC ( )

e-mail Mechanism SMTP(Simple Mail Transfer Protocol) Protocol  
Mechanism Service 가 . Mechanism , e-mail Service 가  
가 Mail Service Service  
Service Administrator , Administrator

Network 가 가 Networking e-mail . e-mail File  
Machine Machine MailBox File Service .

Internet Routing 가 Message  
가 .

Mail . Internet Site **RFC-822**  
RFC [\[1\]](#) . CCITT X.400 .

Unix System Mail .  
sendmail 가 . sendmail  
sendmail GNU/LINUX MTA .

GNU/LINUX (Philip Hazel) Exim .

sendmail Exim 가 . e-mail Site  
sendmail Exim .  
가 .

Exim sendmail Mail System . Mail System  
MTU 가 . sendmail File  
File 가 . sendmail Assembly Source Code  
. [\[2\]](#) Exim sendmail

Mail Program MUA(Mail User Agent) . MUA  
User (UI) 가 . MUA User MailBox Mail ,  
Mail , Message Folder . MUA Mail system  
'Front End' . MUA 가 Computer  
, MUA . Message MUA 가  
Message . MUA Message Machine  
Machine MTA . Mail Message MTA .

Incoming Message Local Process Remote Host . Mail Server Incoming  
Message Local File, Pipe Local Process Remote Host, 3 가 가  
.

MUA 가 MTA Host . Host  
가 .

MUA, MTA Mail (Disk Storage) 가 System , Password  
System Login 가 . MUA 가 MUA  
Mail Message MTA Message System Process MTA .  
MUA MTA Message 가 Password 가 . MTA

Outgoing Message . RFC 822 , Header **From:** Line  
 Address 가 Message MTA Address 가 **sender:** Line  
 가 .

MTA Message Spool . Spool 가  
 . MTA 가 Message Disk  
 . Spool Mail Disk .

Remote Host 가 Message , MTA TCP/IP SMTP(Simple Mail Transfer Protocol)  
 Host Message . Message Host Host 가 Internet ,  
 Message Host . Message MTA  
 Host 가 . 가 Incoming Mail Mail Hub  
 Host Route . Firewall Host Host  
 . Message 가 Host , Host MTA  
 Message MailBox , MUA Access .

Network MTA [3]

MTA DNS , Domain Backup Host  
 . Down MTA 가 Incoming Mail MTA , MTA 가  
 Mail . MTA Mail MTA  
 , System Administrator Backup  
 Load 가 MTA 가 , Internet SMTP Call ,  
 MTA .

MUA 가 MTA Machine PC Mail  
 . 가 Remote Machine MailBox Mail MUA

**POP(RFC-1939)** **IMAP(RFC-2060)** Protocol Remote Machine MailBox Folder

Access . Remote Machine Access .  
 ID Password Remote Host .  
 POP IMAP Message . Message , MUA Remote Server

MTA Message Forward Mail Message Remote Host .

MTA Message Protocol , MUA 가 MTA  
 Message Forward . .

- MTA MUA Message MTA Message 가  
 . IP Address MTA 가 host ,  
 . Message 가 localhost , Message  
 Message 가 .

- Message 가 . MTA Message Remote Address  
 Domain , Remote Address Local-Part( ID) .

Message MTA Forward MUA

Outgoing Message

- MUA Mail Message Server

Server Server

MUA 가 Internet Host Message Forward 가 ,  
가 가 Server Relay Server Spam Mail Forward

System Administrator 가 Server 가 Spam Mail

Mail Server Relay , [MAPS Dialup User](#)

[List](#) , Spammer Online Database 가 가 .

, MUA MTA Message Forward Protocol

.(RFC-2476). Protocol SMTP , SMTP Port

Protocol

: UNIX OS , Open-Source OS (GNU/LINUX, FreeBSD...)

Package Service ,

Service System Administrator 가 Compile 가 .

Administrator GNU/LINUX 가 Cracking OS

System Administrator Service

. Service 가

가

가 Manual FAQ

가..?

가 .

" "

.....

System Administrator Service 가 가 ?

Service ,

가 가

System Administrator . System Administrator 가 가

, 가 Network Protocol

Server Program

Service System Administrator

가 가

System Administrator

(Manual, FAQ)

가 .



System Administrator

가 ?

Exim

"Internet Mail"

가.

Exim sendmail

Mail Exim

Service

Service

, 가

System Administrator

Exim

Exim

Mail Service

.....

[1] e-mail Graphic, ,

Machine

[2] Administrator Sendmail

, Sendmail

[3] Secondary MX Server

### 2.1. MTA

Mail

MTA

Domain

Mailbox ,

Mail

가

ISP

Server

,

가

Host 가

Host

Internet

Mail

Server

Internet

:

가

MTA

Mail Routing

Queue

가

IP 가

Internet

Host

ISP

Server

Mail

가

Outgoing Message

Routing

DNS

Outgoing Message

가

Message Copy 가

MTA 가

Message

Queue

, Server Message

Mechanism . Incoming Mail , Domain , Mail  
 Server Internet .  
 MailBox Mail Server .  
 Domain 가 Mail Computer .  
 MTA Host Mail Network  
 Hub 가 . Outgoing Mail Network Hub  
 Router . Network  
 Domain 가 . Domain MTA ISP  
 . ISP Domain 가 가 .  
 • Client , ISP 가 MailBox . Client 가 Server ,  
 ISP Server Mail Client 가 . MTA 가 , MTA ISP Server  
 MailBox .  
 • Client , ISP MTA System MTA .  
 ISP Mail Domain Client MTA .

## 2.2. Mail Message(RFC-822 Message )

Internet e-mail Message RFC-822 , Host  
 Message 가 . RFC-822 가 Message Protocol .  
 SMTP(Simple Mail Transfer Protocol)가 Message Protocol . RFC-821  
 , RFC-1123 RFC SMTP . SMTP  
 RFC-822 , Domain , (-) .  
 가 Local Address 가 Message SMTP  
 RFC-821 .  
 Internet Mail RFC-822 user@host.domain(host.domain Host FQDN)  
 . ' at' , ' (at)' .  
 Host Routing . Mail Message Routing  
 Mechanism .  
 가 Internet Site RFC-822 . Mail  
 News Service .  
 Message Text Line Host Linefeed(ASCII code 10)  
 Carriage Return (ASCII Code 13) Line . CRLF  
 . Host Message RFC-822 Format . Application Line

Application CRLF Unix Line  
 Carriage Return 가 Linefeed .  
 Mail Message Message Text Message Body ( Data)  
 Data 가 .  
 Data , envelope . Message 가  
 Software .  
 Mail , Message Mechanism ,  
 Mail Message Data . Network Mail Message Mail  
 Header . Mail Header Mail Body .  
 Unix Mail Software RFC-822 Header .  
 ARPANET Design . UUCP  
 Network Network . Header .

From: P.C.Harley <pcharley@example.net>  
 To: My Pan <all@panclub.net>,  
 My wife <casta@wife.net>  
 Cc: My Second <ksy@ksy.net>  
 Subject: I LOVE YOU!!!!

Header Line <TAB> 가 Line 가 . Header  
 Line . Message Body 가 . 가 , Message Body  
 Text . RFC-822 (lowest common denominator)  
 Data , (international character set) **MIME** (Multipurpose  
 Internet Mail Extensions, RFC-1341, RFC-1521 RFC ) 가  
 . MIME(RFC-1521) Body , 가 Header  
 Line . Encoding . Binary Data  
 SMTP Binary Data Host 가 .  
 Mechanism File 가 .  
 RFC-822 Message Header . :

To: pcharley@example.net  
 To: Laetitia Casta <casta@mylove.net>  
 To: ksy@second.net (ko so young)

Line . RFC Header Line  
 Header Line :

Date: Fri, 7 Jan 2000 14:20:24 -0500 (EST)

Header Line (EST) RFC-822

Header Line <>

Local-Part Domain @ Local-Part ID ,  
 Mailing List Gateway Forward Message Mail Domain Local-Part 가  
 ID

Header Column  
 Field , Colon Field Data Field Field  
 Header Line <TAB> Header Line  
 Header Line Field

From root@sample.com Fri Jan 17 14:02:14 2003  
 Return-path: <root@sample.com>  
 Envelope-to: pcharley@debian.sample.com  
 Received: from mail.sample.com ([192.168.1.105] ident=mail)  
 by debian.sample.com with esmtp (Exim 3.35 #1 (Debian))  
 id 18Z0ds-0001cR-00  
 for <pcharley@debian.sample.com>; Fri, 17 Jan 2003 14:02:08 +0900  
 Received: from root by mail.sample.com with local (Exim 3.35 #1 (Debian))  
 id 18Z0dq-0003CA-00  
 for <root@sample.com>; Fri, 17 Jan 2003 14:02:06 +0900  
 To: root@debian.sample.com  
 Subject: sample test  
 Message-Id: <E18Z0dq-0003CA-00@mail.sample.com>  
 From: root <root@sample.com>  
 Date: Fri, 17 Jan 2003 14:02:06 +0900  
 X-Organization: Debian GNU/Linux Network World  
 X-pcharley-say: Faith be to human being forever and ever...

Header Field elm, pine, mush, mailx, mutt 가 Mailer Interface  
 가 가 가 , elm Message Header  
 Mail Software 가 Local  
 MailBox File Mail Message From [\[1\]](#) RFC-822  
 Header 가 Mail Software 가 MailBox . Message Body From

> escape

가 .

**From:**

e-mail Address , ' ' .

**To:**

e-mail Address . Address .

**Cc:**

' (carbon copies)' e-mail Address .

**Bcc:**

' ' e-mail Address . 'Cc:' 'Bcc:' 'Bcc:'

Mail Message Header .

Message .

**Subject:**

Mail .

**Date:**

Mail

**Reply-To:**

e-mail Address . 가

가 Mail . Field .

**Organization:**

Mail Machine . Machine

'private' . RFC

Mail Software .

**Message-ID:**

Mail System Mail Software 가 . Message ID Message

**Received:**

Mail Site( )가 Site Message ID, Mail  
, Message Site, Software 가 Header  
Mail Routing 가가 System  
Administrator

**X-anything:**

Mail Program 'X-' Header . RFC  
가 , 가 Linux Mailing List Server  
'X-Mn-Key' Channel 가 Mail 가 .

[\[1\]](#) Colon(:)

**2.3. e-mail Address**

e-mail Address . Host  
Mail Mail Domain . Login  
alias ID . X.400 Mail Address  
' (attribute)' set , X.500 Directory Server Host

**2.4. Mail 가? (Host Message )**

mail mailx MUA elm, mush, pine, mutt MUA Mail  
가 Mail Message MUA MTA Message Forward  
System Local Remote Message MTA  
Local MailBox Message append . MTA Local  
Aliasing(Local Address 가 Address 가 ) Forwarding( Mail  
Redirect ) Mail Bounce ,  
가 Error Message .



Content-Type: TEXT/PLAIN; Charset=euc-kr

Hello,  
I'm Handsome Guy!!!!

**envelope** ; Message **DATA** Line Dot(.) 가  
Message **Data** Line Dot(.) . Header Section

MTA Message 가 MUA RFC-822 **Date:** **Message-id:** .  
Message Body 가 **MIME** MUA **MIME-Version:** **Content-Type:** Header Line  
. RFC-821 Message 가 MTA Header Line **Received:** .  
Message Routing Header Message 가 .

Message 가 가 Header Line , MUA ( , , )  
Header , Header 가 MUA 가  
Header .

**envelope** Message Header 가 . MUA MTA **To:, Cc:**  
**Bcc:** Data **envelope** , **Bcc:** 가 , Header Line **Bcc:**  
. **To:** **Cc:** **Bcc:** Message Header

Message 가 , Exim MTA **envelope** **Envelop-to:** Header  
Line 가 . **envelope** 가 Header . , Mailing  
List **postmaster@xyz.example** Message . Mailing  
List **alias** . Mailing List Message Header  
가 . Line Header .

To: some-list@listdomain.example

**postmaster** Mail Local System Administrator alias  
**postmaster@xyz.example** **envelope** . **Envelope-to:** 가 Local System  
Administrator MailBox message 가 가 .

**envelope** Bounce Message **return path** .  
Message Header **From:** . 가  
가 가 .



- Message 가 Mailing List , Bounce Message envelope  
Message 가 Mailing List List Program 가  
가 가 List Program .
- MTA ( bounce message ) envelope  
Bounce Message ,  
bounce Message Bounce Mail  
Bounce Mail loop 가 .

## 2.5. SMTP

SMTP command-reply Protocol . Client Host Server  
3 .

250 Message accepted

Client 가 가 .

### 2-1. SMTP

Code	
2xx	
3xx	가 Data 가
4xx	Error 가
5xx	Error 가

가 . MTA 가 . , Exim  
Text .  
Code (-) . Code

550-Host is not on relay list  
550 Relaying prohibited by administrator

Client 가 Server SMTP Port( 25 ) ,  
Server Server Software Client .  
Server Client .

220 ESMTP Ready

Client FQDN EHLO (extended hello) Session .

EHLO client.example.com

Server , EHLO Server  
EHLO Data 가 . EHLO  
Server Line Server 가 . Server 가  
SMTP .

250-server.example.com hello client.example.com

250 SIZE 10485760

Server SIZE , Message 가 10,485,760 .

EHLO , Client Host Message . Message 가  
Message envelope 가 MAIL . SIZE Server  
Message Size .

MAIL FROM: <pcharley@harley.example> SIZE=12345

Server , RCPT .

RCPT TO: <casta@casta.example.net>

Client . Server  
Error 가 Client Message

- Domain Local Server 가 local-part 가 .
- Domain Server Domain 가 Relay 가 .

Temporary Error Disk DNS Database Error 가  
Temporary 가 Client SMTP Temporary  
가 Message . 가 10  
15 가 Temporary 가 가 .

MAIL ,

DATA

Server Message Data 354 Code . Client  
 Message . dot(.) Line . Message dot(.)  
 Line , dot Message . Server Text  
 Line dot . Server 가 Data , 가 Message  
 가 Client Message Copy . Message 가 Client  
**QUIT** SMTP Session .

SMTP Message envelope , Server Data 가  
**envelope** . envelope 가 , Message Error 가  
 가 , Message 가 가 . , Client  
 Software( RFC-821 ) **DATA** Error , **DATA** Temporary  
 Error . Message .

## 2.6. Mail Routing 가? (Message Routing)

MTA 가 Message . Local Remote  
 Outgoing Message 가 Mail  
 Message . Domain Host , Domain  
 Message MTA . Host Message , Message 가  
 Host Remote Host Message .  
 Local Remote, 가 . Message 가 ,  
 Local-Part Domain . Domain Remote Host 가 , Local-  
 Part Route . Domain Local Host Local-Part 가 Route 가  
 . , MTA 가 Message

- 가 , 가
  - Domain .
- (Local Addresses)**
- Alias , . forward File , Mailing List , System
  - MailBox Message **Local-Part**
  - Message 가 Client Host Local Routing ( , Mail Hub
  - Firewall Host Domain) Local .
  - , DNS Host .
  - Routing
  - Remote Host List .
  - , MTA . **pipe**
  - Host File .

- Message 가 Host Route , RFC **envelope** Message
- Host Temporary Error 가 , MTA

## 2.7. Incoming

MTA SMTP 가 Local Setting Incoming Message 가 **Local-Part** 가 , **envelope** **RCPT** Error Code Relay

: Incoming Message 가 Message Remote Host Relay Mail Server Message

Message Relay MTA 가 Message , **Bounce** Message 가 Incoming Mail Message 가 Local Host 가 Site 가 MTA **Bounce** Message 가가 " **Site** **Local Mail Daemon** 가 ?"

Incoming Message MTA 가 Message SMTP Message MTA 가 Message , **Bounce** Message 가 **Bounce** Message Mail **envelope** 가 , Message **Bounce** Message Spam Message **envelope** Spam Mail MTA 가 **envelope**

Exim , Domain Setting 가 SMTP 가

MTA 가 **envelope**

- MUA MTA. ID Domain MTA Setting , PC MUA . Error Protocol Message

Gateway , Message Header From:

- DNS
- DNS ; , zone
- 

part 가 DNS local-

Internet Mail(Spam Mail Junk Mail) 가 System  
 Administrator MTA Spam Mail 가

- 가 Host
- [Realtime Black hole](#) "blacklist" , BlackList DB Host  
 Message , 가 Header Line Spam 가
- 가 Host relay Mail Local Server 가  
 Server
- Header Header 가 Message
- Spam Mail 가 , Mail , 가  
 Message Bounce
- Virus Attach File

## 2.8. DNS

DNS Domain Key Index , Data 가  
 DataBase Mail Data DNS  
 Application , Item , Record Unit 가

```
<domain > <record > <
```

**Record :**

```
www.web.example. A 10.8.6.4
```

Domain **www.web.example** , Record A ( ) ,  
 10.8.6.4 Data Record Domain Host IP  
 DNS Record

Host 가 NIC 가 NIC IP 가 , NIC  
 IP 가 Host Domain Name Record . DNS Domain  
 : DNS A Record **abc\_xyz#2.example.com** Domain Name  
 가 Host **RFC-952** , , (-  
 ) SMTP e-mail Domain 가 .  
**user@abc\_xyz#2.example.com** **RFC-821** SMTP  
 Mail 가 , MX Domain Host .  
 Local DNS . Local DNS

DNS **Name Server** . Internet . System  
 Administrator (Zone) , Master Server . Server  
 Data 가 .  
 Domain .  
 , uk, ac.uk **cam.ac.uk** . Domain  
**csx.cam.ac.uk** . **csx.cam.ac.uk** Data **cam.ac.uk** .  
**cam.ac.uk** .

Master Server 가 . Master Zone Data Slave  
 Server 가 . Name Server Master 가 Slave 가 . Zone  
 File Name Name 가 DNS  
 , Host . Name Server Data  
 Server .

Master Slave . Zone  
 Slave 가 . ISP Slave Name  
 . Zone 가 Name Server Zone Server .  
**Root** Name Server 가 .

Caching DNS Software . Record **time-to-live(ttl)**  
 Field . Name Server ttl Data  
 . ttl .

## 2.9. Mail Routing DNS record (MX Record)

Mail Domain Mail Host . ,  
 e-mail **plc.example.com** Domain 가 . **mail-1.plc.example.com**  
**mail-2.plc.example.com** Host Mail . DNS **Mail Exchange(MX)**  
 Record 가 . MX Domain Mail Host Mail

Domain Mapping . Domain MX Record (Mail ) 가 ,  
 Name Server 가 Mail Server Query MX Record List ;

hermes.example.com.	MX	5	green.csi.example.com.
hermes.example.com.	MX	7	sw3.example.com.
hermes.example.com.	MX	7	sw4.example.com.

**hermes.example.com** Domain Mail Host .  
 Domain Mail Host , **green.csi.example.com** 가  
 가 . **hermes.example.com** Domain Mail MTA 가  
**green.csi.example.com** 가 Host  
 Mail 가 . MX Record ,

MTA 가 MX Record Host List IP 가 .  
 Record , Record 가 .

green.csi.example.com.	A	192.168.8.57
sw3.example.com.	A	192.168.8.38
sw4.example.com.	A	192.168.8.44

Name Server 가 MX Host Record 가 , MX Record  
 Record . MX Mechanism 가 DNS Query .

DNS MX Record 가 . Mail Domain Host Name . ,  
 Domain MX Record 가 , MTA Record . Mail

MX Record Mail System Gateway . MX  
 Record Host Mail Domain .

MX Record (preference) 가 , Host MX Record 가  
 Mail Agent Message 가 가 MX .

Address MX 가 MX Host . Mail Loop  
 . Domain MX Record MX Record 가 ,

Mail Agent Domain IP Address 가 Host

Sample,inc mailhub Machine 가 .  
 DNS Database MX Record 가 .

green.sample.com. IN MX 5 mainhub.sample.com

5 가 green.sample.com MX Record mailhub.sample.com  
 joe@green.sample.com Message Host DNS mailhub 가 MX  
 Record 5 가 MX 가 mailhub

MX Record 가 . Internet Mail Routing  
 , RFC-974, RFC-1123

**2.10. DNS Record**

DNS 가 Mail PTR Record IPv4 in.addr.arpa  
 IP PTR Record IP Host Host 가  
 PTR Record IP Host

57.8.168.192-in.addr.arpa. PTR green.csi.example.com.

IP 가 192.168.8.57 Host green.csi.example.com PTR Record  
 Record  
 Record 가

sw4.example.com A 192.168.8.44

, PTR Record Host 192.168.8.44 , sw4.example.com ,  
 :

44.8.168.192.in.addr.arpa. PTR lilac.csi.example.com.

Record 192.168.8.44 가 sw4.example.com IP Host  
 lilac.csi.example.com Service 가 Host  
 Record , Service Host PTR  
 Record 가 가 가  
 , sw4.example.com lilac.csi.example.com Host Mail Switching  
 Service . Service Host DNS 가  
 가 가 ,  
 Record Domain Name Server Query  
 Load-Sharing



Record PTR Record . Record PTR Record  
 . Mail PTR Record Message Remote  
 Host . Incoming TCP/IP IP .  
 Host Remote Host Message .

**CNAME**(canonical name) Record Aliasing . ,

pelican.example.com. CNAME redshank.csx.example.com.

pelican.example.com Host **Canonical** redshank.csx.example.com  
 . **CNAME** Record Mail Routing . MX Record  
 , **CNAME** Aliasing .

## 2.11. DNS

DNS Administrator . Mail

- MX Record 가 **canonical** aliase 가 . MX Record Domain A, A6, AAAA Record CNAME Record 가 ,
- MX Record 가 Host . Host 가 A, A6, AAAA Record 가
- MX Record Host Name IP 가 . Error 가 . RFC-1034 MTA 가 Error Error 가 . Exim Option 가
- MX Record 가 가 .

Name Server MX Record Server Error .  
 MTA 가 MX Record Record Mail  
 가 . Server Error MTA . Server Error MX Record

DNS Server Record . Data 가 Error

, DNS Query 가 . Mail ,  
 Domain Message 가 **"unknown domain"** Error Message  
 . Error Name Server Zone .

Error , Name Server DNS Query . Error  
 NS Record Name , ioe.exampel.com

```
$ nslookup -type=ns ioe.example.com
```

```
ioe.example.com nameserver = mentor.ioe.example.com
ioe.example.com nameserver = ns0.example.net
```

Name , Domain Query . nslookup  
 , Query Name .  
 Name Server 가 가 .

```
$ nslookup saturn.example.com mentor.ioe.example.com
```

```
server: mentor.ioe.example.com
address: 192.168.34.22
```

```
Name: saturn.example.com
Addresses: 192.168.5.4
```

```
$ nslookup saturn.example.com ns0.example.net
```

```
Server: ns0.example.net
Address: 192.168.255.249
```

가 . Master Server 가 Update Slave Server 가 Update  
 가 . 가 DNS Error .

## 2.12. postmaster

**postmaster** MTA . Administrator Software  
 Software , Monitoring . System 가 ,  
 Mail **postmaster** . MTA 가 Mail Internet  
 Host **postmaster** 가 .  
**postmaster@your.domain** System  
 Alias 가 .

2.13.

Mail 가 . MTA MTA .  
 MTA 가 Message . Host  
 IP Message **Received:** Line Log .  
 Spam Mail Header Line 가 . Spam Mail  
 가 . Message Header Line

```
Received: from fooba.com.example ([10.9.8.7])
  by podunk.edu.example (8.9.1/8.9.1) with SMTP id DAA00447;
  Tue, 6 Mar 2001 03:21:43 -0500 (EST)
```

Mail FooBar Podunk . Header Spammer  
 . Administrator 가 MTA 가 Host  
 가 Header **Received:** .

2.14.

SMTP Client , Message  
 가 . Internet Protocol  
 . Mail Host

### 3 . Exim

- 3.1. [Exim](#)
- 3.2. [Exim Queue](#)
- 3.3. [Message](#)
- 3.4. [Exim Process](#)
- 3.5. [Process](#)
- 3.6. [Exim](#)
- 3.7. [Exim Mail](#)
- 3.8. [,](#)
- 3.9.

Capter , MTA 가 Chapter , Exim MTA

#### 3.1. Exim

Exim Network Message 가 Message  
. Internet MTA Message 가  
Exim Philip Hazel British University 90% Message 가  
Message Queing Mechanism . Message 가  
Message  
Mechanism

, Exim 가 , MTA Message 가  
 Message 가 , Message  
 Message  
 System  
 System 가 , Incoming SMTP  
 가가 , Exim , Incoming Message Exim  
 Queue , SMTP  
 Exim Binary ,  
 Message , Message , 가  
 Exim DNS Domain

### 3.2. Exim Queue

Queue Exim 가 가 Message , Exim  
 Queue Message , Queue Pool 가  
 가, Exim Domain Remote Host Queue  
 Exim Message Queue 가 . System Administrator  
 Queue Message .

```
exim -bp
```

Message Queue Message Process  
 Queue Runner Process . Queue Runner Prcess 가  
 Process .

### 3.3. Message

Exim Message . Exim Message  
 . Message Local Spool File("Queue " .)  
 Exim Message Remote Host Local Process Message 가  
 File Local Spool File Message 가 ,  
 Spool File Queue , Message 가 ; File  
 Memory 가 Message 가 .

Spool File Data 가 Message  
 Message Exim Alias, Forwarding, Mailing  
 List

### 3.4. Exim Process

Process , Exim Exim  
 Process 가 , Exim  
 . Exim Process Process , MUA Message MTA  
 Exim Process 가 Process Single Task  
 Exim 가 Daemon Process 가

: Debian GNU/LINUX Exim , System Administrator 가 Setting **inetd**  
**mode** Mail Server **inetd mode** 가 가

- Incoming TCP/IP SMTP Port Port  
 Daemon Process Fork Process
- Queue Runner . Queue Runner Spool Message  
 Message 가  
 Message Queue Process Message  
 , **Queue Runner** Message Message 가  
 Daemon

Daemon Process ,  
 Exim Daemon . **inetd** Incoming SMTP Exim Message  
 Process **Queue Runner** Process Cron  
 , Exim Process 가 가  
 , System , Process

### 3.5. Process

Message Process Process  
 , Process File Process  
 (Synchronization) (Serialization) Exim . Message ,  
 Data Mail **(Hint)** File , Remote  
 Host 가 , **(Hint)** File  
 . Message 가 Process **(Hint)** File 가

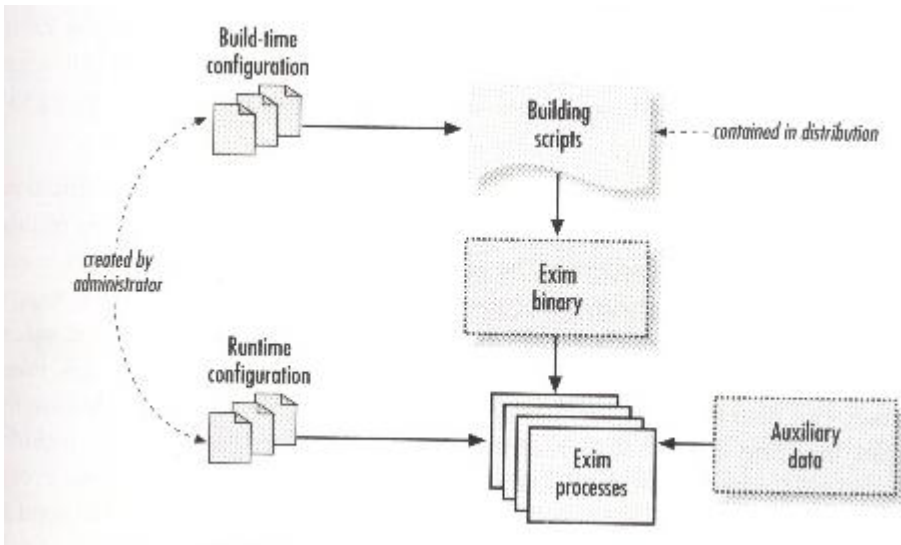
가 Message Host

Data Mail (Hint) File  
Mail Mail 가  
(Hint) File Code

### 3.6. Exim

System Administrator File Exim  
Binary 가 Build Binary 가 Option File  
File Binary Bulid Build 가 가 Exim

#### 3-1. Exim



Exim Build Option 가

- Option Code , LDAP Database , IPv6
- , Exim Spool Message File Mode
- Option , Exim Log File

System , Exim sendmail Install , /usr/lib/sendmail /usr/sbin/sendmail Path 가  
Exim Binary Symbolic Link sendmail Mail MUA, Program  
Script Exim Binary

Exim 가 Option File . Option Main Memory  
 가 Option File Data Exim Main Memory  
 . , File , Exim Daemon  
 . Daemon **SIGHUP** 가 . Exim Process ,  
 File Process 가 , Process  
 : Exim **Super Daemon** , File Exim 가 .  
 , File Data 가 . File  
 가 .

```
qualify_domain = example.com
```

Domain Mail **@example.com**  
 (qualified) .

### 3.7. Exim Mail

Exim . Exim Message  
 , Message 가 .  
 가 가 . , DNS Domain Alias File local-  
 part . TCP/IP SMTP Message  
 Mailbox File Message .  
 Code 가 Exim Block . Block . **Driver**  
 Code Block . , **Driver**  
 , 가 . , **Driver**  
 가 .  
 4 Driver 가 . **Directors, Routers** **Transports** 3 Driver  
 Message . Driver SMTP .  
**Transports** Message File , Pipe , SMTP Exim  
 Message Driver . **Directors** **Routers** Message  
 Driver , Mail . Driver  
 . **Directors** Local **Routers** Remote . Exim ,  
**Directors** **Routers** , Release 가 가



Exim Local Host Remote Host  
 ( Mailbox 가, SMTP  
 Remote Host 가) **Transports** Driver  
 , **bug\_reports@exim.example** , **exim.example** Local Domain  
 : File  
 • Driver System Alias **Directors** . Exim /etc/alias  
 local-part bug\_report 가 alias ,  
**brutus@exim.example** **julia@helpersys.org.example**  
 Drivers 가  
 • **brutus** **Directors** . **Directors**  
 brutus Mailbox Message **appendfile** , **Transports** Exim  
 Exim  
 • , Exim DNS **helpersys.org.example** Remote Host Domain  
**routers** , Message , Remote Host IP . **routers** Remote  
 Host **SMTP transport** Exim  
**Drivers** 가 . Driver

aliasfile

alias director

appendfile

Message File transports

autoreply

Message transports

domainlist

Domain Route router

forwardfile

**.forward** File Exim System Filter directors

ipliteral

user@192.168.5.6 IP Mail router. Internet .

lmtp

LMTP Protocol Process Message transports

localuser

Message directors

lookuphost

DNS Domain router

pipe

Pipe Process Message transports

queryprogram

Domain Route Program router

smartuser

directors.

smtp

SMTP LMTP , TCP/IP Host Message transport.

driver Code 가 Driver Type

Option Driver Logging driver ,

File 가 .

### 3.8. ,

Mail Local Remote 가 가 . Exim Message ,  
Local-Part Domain . , Domain Remote Host ,  
Local-Part Routing . Domain Local Host  
가 , Local-Part Message .

가 , Exim 가 Directors Routers  
 . Exim File Directors Router Domain Local  
**Domain** List , Directors 가 **Local Address**  
 Router 가 **Remote Address**  
 Exim (:) Domain List , **local\_domains** Domain Local  
 Option , Local Host 가 local domain  
 , Pattern 가

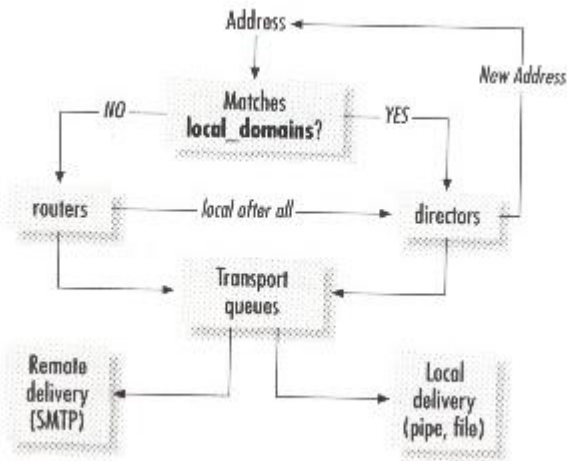
```
local_domains = test.pcharley.example: \
                *.magapa.example: \
                dbm;/usr/exim/domains
```

List Item **test.pcharley.example** Single Domain . Item **magapa.example**  
 Domain Pattern Matching . Item DMB File  
 /usr/exim/domains . DMB File Host 가 Local Domain .

### 3.9.

Exim 가 Local Remote , 가 Director Router  
 File Director Router  
 Director Transport Queue , Message List  
 가 (child) ,  
 가 Local-Part 가 Alias List . forward File Match 가  
 Router Transport Queue , Domain  
 Router . Router . Director Router 가 ,  
**Decline** . Director Router 가 **Decline** ,  
 가 Director Routers .

### 3-2. Directing & routing



## 4 . eximconfig

Exim **eximconfig** Perl Script 가 Exim Maintainer . Script  
 Debian GNU/LINUX . Script Exim Setting .  
**eximconfig** Script , Service System  
 Administrator 가 File . , **eximconfig** ,  
 Service Option .  
 가 가 가 .

- Domain : pcharley.net
- Local Network : 192.168.1.0/25
- System Administrator : pcharley

root **eximconfig** .

```
# eximconfig
```

Exim Message 가 .

You already have an exim configuration. Continuing with eximconfig will overwrite it. It will not keep any local modifications you have made. If that is not your intention, you should break out now. If you do continue,

then your existing file will be renamed with .0 on the end.

[---Press return---]

Enter

가 . Exim Maintainer 가

가

.

You must choose one of the options below:

- (1) Internet site; mail is sent and received directly using SMTP. If your needs don't fit neatly into any category, you probably want to start with this one and then edit the config file by hand.
- (2) Internet site using smarthost: You receive Internet mail on this machine, either directly by SMTP or by running a utility such as fetchmail. Outgoing mail is sent using a smarthost, optionally with addresses rewritten. This is probably what you want for a dialup system.
- (3) Satellite system: All mail is sent to another machine, called a "smart host" for delivery. root and postmaster mail is delivered according to /etc/aliases. No mail is received locally.
- (4) Local delivery only: You are not on a network. Mail for local users is delivered.
- (5) No configuration: No configuration will be done now; your mail system will be broken and should not be used. You must then do the configuration yourself later or run this script, /usr/sbin/eximconfig, as root. Look in /usr/share/doc/exim/example.conf.gz

Select a number from 1 to 5, from the list above.

Enter value (default=`1', `x' to restart):

1.	Internet Site : SMTP	Mail	.	Category
	Category	Internet	Host	Domain 가 Mail
	Server	.		

2. **Smarthost** Internet Site : SMTP , fetchmail utility  
 Mail . Outgoing Mail **smarthost**  
 Category **Dialup** 가 Internet  
 Smarthost **domainlist** Driver . Cable Line ADSL
3. Satellite System : Mail **smarthost** . root  
 postmaster Mail /etc/aliases Mail
4. : Host 가 Network Mail
5. No Configuration :

1

What is the `visible' mail name of your system? This will appear on From: lines of outgoing messages.  
 Enter value (default=`debian.example.com', `x' to restart):

Mail System 가? Outgoing Message Header **From:** line  
 Domain **qualify\_domain** Option , Outgoing Message Header **From:**  
 가 Domain **pcharley.net**

Does this system have any other names which may appear on incoming mail messages, apart from the visible name above (debian.onoffkorea.com) and localhost?

By default all domains will be treated the same; if you want different domain names to be treated differently, you will need to edit the config file afterwards: see the documentation for the "domains" director option.

If there are any more, enter them here, separated with spaces or commas.  
 If there are none, say `none'.  
 Enter value (default=`none', `x' to restart):

Domain Localhost , Incoming Mail Message Domain 가?

Domain . Domain , File  
"Domains" Director

Domain Space .

Mail Server 가 Virtual Domain , Virtual Domain .  
Domain **local\_domains** Option . Virtual Domain 7 .  
Enter .

All mail from here or specified other local machines to anywhere on the internet will be accepted, as will mail from anywhere on the internet to here.

Are there any domains you want to relay mail for---that is, you are prepared to accept mail for them from anywhere on the internet, but they are not local domains.

If there are any, enter them here, separated with spaces or commas. You can use wildcards. If there are none, say `none'. If you want to relay mail for all domains that specify you as an MX, then say `mx'  
Enter value (default=`none', `x' to restart):

Internet Mail 가 , Host, Local Machine Internet  
가 Mail .  
:  
...:<

Relay Domain 가? Internet Domain Mail .  
Local Domain .  
Domain Space Comman . DNS MX  
Domain Relay MX .

Incoming Relay Domain . Domain **relay\_domains** Option ,  
Incoming Relay 가 (Router, DNS) . Domain Name **MX** ,  
**relay\_domains\_include\_local\_mx** Option . **relay\_domains\_include\_local\_mx** Option Message  
가 DNS MX Record Incoming Relay .

: **relay\_domains\_include\_local\_mx** Option DNS Domain  
Backup Server Administrator Server Secondary MX Record List

Server 가  
 Secondary MX Server Hostmaster 가 , Mail Server  
 , Administrator 가 가  
 가  
 Incoming Relay , Mail Hub Secondary Mx Server [1] 가 . Mail Hub Site  
 Firewall Internet Host . Incoming Relay  
11 . Enter .

Obviously, any machines that use us as a smarthost have to be excluded from the relaying controls, as using us to relay mail for them is the whole point.

Are there any networks of local machines you want to relay mail for?

If there are any, enter them here, separated with spaces or commas. You should use the standard address/length format (e.g. 194.222.242.0/24)  
 If there are none, say `none'.

You need to double the colons in IPv6 addresses (e.g. 5f03::1200::836f:::/48)  
 Enter value (default=`none', `x' to restart):

Host **Smarthost** Host relay .  
 Mail Relay Local Network 가? Network **host\_accept\_relay** .  
 Network Space . Address/Length  
 ( . 192.168.1.0/24) .  
 Host Network Relay . IP 가  
 Relay . IP (Modem, ADSL Cable  
 Modem) Mail Service .  
 MUA MTA Mail Forward ID/Password . TLS  
 Session .  
 가 Local Network 192.168.1.0/25 .

Mail for the `postmaster' and `root' accounts is usually redirected to one or more user accounts, of the actual system administrators.  
 By default, I'll set things up so that mail for `postmaster' and for various system accounts is redirected to `root', and mail for `root'



is redirected to a real user. This can be changed by editing /etc/aliases.

Note that postmaster-mail should usually be read on the system it is directed to, rather than being forwarded elsewhere, so (at least one of) the users you choose should not redirect their mail off this machine.

Which user account(s) should system administrator mail go to ?

Enter one or more usernames separated by spaces or commas . Enter 'none' if you want to leave this mail in 'root's mailbox - NB this is strongly discouraged. Also, note that usernames should be lowercase!  
Enter value ('x' to restart):

```
postmaster      root          Mail          System Administrator      Redirect      .
      Default      System          Mail      root      Redirect      . root          Mail
      System Administrator      Redirect      .          /etc/aliases File      .

      System Administrator      pcharley      .
```

You already have an /etc/aliases file. Do you want to replace this with a new one (the old one will be kept and renamed to aliases.0)? (y/n)  
Enter value (default='y', 'x' to restart):

```
/etc/aliases File      Message      . Y      .
```

In order to use the TLS (Transport Layer Security) features built in to this version of the exim package (exim-tls), you must either supply a certificate and private key or one will be generated now.

Would you like to enable TLS? (y/n)

```
, exim-tls Package      Install      .          TLS
      TLS      Enable      . Y      .
```

Please note that self-signed certificate made in this way is sufficient for testing, and may be adequate for all your requirements if you are mainly interested in encrypting transfers, and not in secure identification.

Using configuration from /usr/lib/ssl/openssl.cnf

Generating a 1024 bit RSA private key

```

.....+++++
.....+++++
writing new private key to '/tmp/fileR6Gowd'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:kr
State or Province Name (full name) [Some-State]:seoul
Locality Name (eg, city) []:seoul
Organization Name (eg, company) [Internet Widgits Pty Ltd]:pcharley ltd
Organizational Unit Name (eg, section) []:computer team
Common Name (eg, YOUR name) []:P.C.Harley
Email Address []:admin@pcharley.net

```

**self-signed**

가

가

```

: openssl req -x509 -newkey rsa:1024 -keyout [ ] -out [ ] -days 0 -nodes
eximconfig . eximconfig
. eximconfig -days 0 Option
, Exim Bug Report
/usr/sbin/eximconfig $tls_days = "0";

```

**openssl**

TLS Session

가

가

PAM

PAM

가

Patch

The following configuration has been entered:

```

=====
Mail generated on this system will have `pcharley.net' used
as the domain part (after the @) in the From: field and similar places.

```

The following domain(s) will be recognised as referring to this system:

localhost, pcharley.net

Mail for postmaster, root, etc. will be sent to pcharley.

Local mail is delivered.

Outbound remote mail is looked up in the Internet DNS, and delivered using that data if any is found; otherwise such messages are bounced.

Note that you can set email addresses used for outgoing mail by editing /etc/email-addresses.

Is this OK ? Hit Return or type `y' to confirm it and install, or `n' to make changes (in which case we'll go round again, giving you your previous answers as defaults. (Y/n)

```
Outgoing Message      Rewritten      /etc/email-addresses      .
      .              Y              .              .      MTA      pcharley.net      Mail
      , Outgoing Message Header      From:      pcharley.net      .      Local Network
192.168.1.0/25      Mail      Relay      . eximconfig Script
      File      .
```

```
#####
#          MAIN CONFIGURATION SETTINGS          #
#####

qualify_domain = pcharley.net
# qualify_recipient =
local_domains = localhost:pcharley.net
local_domains_include_host = true
local_domains_include_host_literals = true
#relay_domains =
#relay_domains_include_local_mx = true
never_users = root
host_lookup = *
# headers_check_syntax
#rbl_domains = rbl.mail-abuse.org/reject : dialups.mail-abuse.org/warn
```

```

host_accept_relay = 127.0.0.1 : :::1 : 192.168.1.0/25
host_auth_accept_relay = *
# percent_hack_domains=*
trusted_users = mail
smtp_verify = true
gecos_pattern = ^([^,:]*)
gecos_name = $1
smtp_accept_queue_per_connection = 100
freeze_tell_mailmaster = true
received_header_text = "Received: \
    ${if def:sender_rcvhost {from ${sender_rcvhost}\n\t}\
    ${if def:sender_ident {from ${sender_ident} }}\
    ${if def:sender_helo_name {(helo=${sender_helo_name})\n\t}}}\
    by ${primary_hostname} \
    ${if def:received_protocol {with ${received_protocol}} \
    ${if def:tls_cipher {\n\t(Cipher ${tls_cipher}) }}\
    ${if def:tls_peerdn {(PeerDN ${tls_peerdn}) }}\
    (Exim ${version_number} #${compile_number} (Debian))\n\t\
    id ${message_id}\
    ${if def:received_for {\n\tfor <${received_for}>}"
tls_advertise_hosts = *
tls_certificate = /etc/exim/exim.crt
tls_privatekey = /etc/exim/exim.key
# Paramter file for Diffie-Hellman parameters - see dhparam(1ssl)
#tls_dhparam = /etc/exim/cert/exim.dhparam
#auth_over_tls_hosts = *
tls_log_cipher = true
tls_log_peerdn = true
#accept_8bitmime = true
#local_interfaces = 127.0.0.1
#queue_list_requires_admin = false

end

#####
#                TRANSPORTS CONFIGURATION                #
#####
#                ORDER DOES NOT MATTER                    #

```

```

#    Only one appropriate transport is called for each delivery.    #
#####

local_delivery:
    driver = appendfile
    group = mail
    mode = 0660
    mode_fail_narrower = false
    envelope_to_add = true
    return_path_add = true
    file = /var/spool/mail/${local_part}

address_pipe:
    driver = pipe
    path = /usr/bin:/bin:/usr/local/bin
    return_output

address_file:
    driver = appendfile
    envelope_to_add = true
    return_path_add = true

address_directory:
    driver = appendfile
    no_from_hack
    prefix = ""
    suffix = ""
# maildir_format

address_reply:
    driver = autoreply

procmail_pipe:
    driver = pipe
    command = "/usr/bin/procmail"
    return_path_add
    delivery_date_add
    envelope_to_add
# check_string = "From "

```

```

# escape_string = ">From "
  suffix = ""

remote_smtp:
  driver = smtp
# authenticate_hosts = smarthost.isp.com

end

#####
#                DIRECTORS CONFIGURATION                #
#          Specifies how local addresses are handled          #
#####
#                ORDER DOES MATTER                #
#  A local address is passed to each in turn until it is accepted. #
#####

real_local:
  prefix = real-
  driver = localuser
  transport = local_delivery

system_aliases:
  driver = aliasfile
  file_transport = address_file
  pipe_transport = address_pipe
  file = /etc/aliases
  search_type = lsearch
# user = list
# Uncomment the above line if you are running smartlist

userforward:
  driver = forwardfile
  file_transport = address_file
  pipe_transport = address_pipe
  reply_transport = address_reply
  no_verify
  check_ancestor

```

```

check_local_user
file = .forward
modemask = 002
filter

procmail:
driver = localuser
transport = procmail_pipe
require_files = ${local_part}:+${home}:+${home}/.procmailrc:+/usr/bin/procmail
no_verify

localuser:
driver = localuser
transport = local_delivery

end

```

```

#####
#                ROUTERS CONFIGURATION                #
#    Specifies how remote addresses are handled        #
#####
#                ORDER DOES MATTER                    #
# A remote address is passed to each in turn until it is accepted. #
#####

```

```

lookuphost:
driver = lookuphost
transport = remote_smtp

```

```

literal:
driver = ipliteral
transport = remote_smtp

```

```

end

```

```

#####
#                RETRY CONFIGURATION                #

```

```
#####

# Domain          Error      Retries
# -----          -
*                  *          F,2h,15m; G,16h,2h,1.5; F,4d,8h

end

#####
#                  REWRITE CONFIGURATION                #
#####

*@pcharley.net    ${lookup{$1}lsearch{/etc/email-addresses}\
                  {$value}fail} frFs

end

#####
#                  AUTHENTICATION CONFIGURATION          #
#####
```

[\[11\]](#) 2 Mail Server, Backup Mail Server Queuing Server .



## 5 . Main Section

5.1. [System Load](#)

5.2. [Connection](#)

5.3. [Size](#)

5.4. [Message](#)

5.5. [Option](#)

Option . System Administrator .  
Option .  
Option . [Exim](#) [Homepage](#) .  
Option .

### 5.1. System Load

Exim Incoming Message Process  
 Message Queue . Exim System Load 가 , Exim  
 Option .

- **queue\_only\_load** : System Load 가 Option , Incoming Message Process , Incoming Message Exim Queue Queue Runner Process 가 .
- **deliver\_load\_max** : System Load 가 Option , Queue Runner Process 가 Load 가 Option , Queue Runner Process .
- **deliver\_queue\_load\_max** : Option **deliver\_load\_max** , Queue Runner Process .

```
deliver_load_max = 15
deliver_queue_load_max = 20
```

System Load 가 15 - 20 Incoming Message Process ,  
 Queue Runner Process . System Load 가 20 ,  
 Incoming Message Return .  
 가 Option . **queue\_only\_load** , System Load 가  
 Queue Runner Process System Load 가 ,  
**deliver\_load\_max** **deliver\_queue\_load\_max** .

```
deliver_load_max = 10
deliver_queue_load_max = 14
```

Option , System Load 가 10 - 14 Incoming Message  
 Process , Queue Runner Process . Option  
**queue\_only\_load** Option 가 .

## 5.2. Connection

SMTP System Resource , SMTP  
 Option .

- **smtp\_accept\_max** : SMTP Incoming Message .  
 Error Message Return .

421 Too many concurrent SMTP connections; please try again later.

- **smtp\_accept\_max\_per\_host** : IP SMTP Incoming Message  
Error Message Return

421 Too many concurrent SMTP connections from one IP address; please try again later.

- **smtp\_accept\_queue** : SMTP Incoming Message  
Incoming Message Exim Queue
- **smtp\_accept\_queue\_per\_connection** : (Session) SMTP Incoming Message  
Incoming Message Incoming Message  
Queue

```
smtp_accept_max = 300
smtp_accept_max_per_host = 100
smtp_accept_queue = 200
smtp_accept_queue_per_connection = 100
```

SMTP Message 300 , IP SMTP  
Message 100 SMTP Message 가  
200 Incoming Message Exim Queue , Session  
SMTP Message 가 100 Incoming Message  
Exim Queue

**smtp\_accept\_queue = 200**, Option **smtp\_accept\_max** System Load  
가 Remote 200 Message 가 Incoming  
Message Queue , Message 가 300 가 Incoming Message  
Reject

**smtp\_accept\_queue\_per\_connection = 100** Option MTA Server 가 Down  
Remote Server Message 가 Exim Process

MTA Bounce Message 가

### 5.3. Size

Exim Incoming Message Size, Spool System Spool Option  
 . Option Disk 가  
 , Message Network Traffic .

- **message\_size\_limit** : Incoming Message
- **quota\_is\_inclusive** :
- **quota** : Spool File
- **quota\_warn\_threshold** : Spool File Quota . Quota  
 Message
- **quota\_warn\_message** : Spool File Quota **quota\_warn\_threshold** Option  
 Message .
- **check\_spool\_space** : System Spool

Exim **message\_size\_limit** Option File Incoming Message 가  
 , . Option , Remote Incoming  
 Message Relay Message Size .

```
message_size_limit = 10M
```

Option Incoming Message 10M 가 . 가 Message  
 . File 가 Message 가 10M .

Mail Server Spool **Quota** Spool . Linux Kernel  
 Quota Ext2 Filesystem , **ReiserFS** Ext2 Filesystem Kernel  
 Patch . [\[1\]](#) Debian GNU/LINUX Kernel Patch  
 가 . Exim Mail , Option  
 . **TRANSPORTS** Section **local\_deliver:** . Quata **appendfile** Driver

```
quota_is_inclusive = false
quota = 100M
quota_warn_threshold = 95%
quota_warn_message = "\
To: $local_part@$domain\n\
Subject: Your mailbox exceed!!!\n\
This message is automatically created by mail delivery software.\n\n\
The size of your mailbox has exceeded a warning threshold that is\n\
set by the system administrator.\n"
```

MailBox(Spool File) 100M , Quota 95%  
**quota\_warn\_message** Option Message Message 가  
 가 .

**quota\_is\_inclusive** Option . Exim Quota Check Message  
 Check , Message Check . **true** , True  
 Exim Quota Check Message . Message 가  
 Quota Exim Message Incoming Message

System Mail Spool Directory Exim Incoming Message  
 가 .

check\_spool\_space = 200M

System Spool Directory 200M Mail .

[\[1\]](#) 2.4.20 Kernel Quota Ext2 .

#### 5.4. Message

Exim Message Option . Message Header ,  
 Option Message 가 , Message Spam  
 Junk Mail 가 .

Message Envelope sender Bounce Message 가 . Host 가 Sender  
 , 가 Message Bounce Message 가 Message 가

**Frozen** . System Administrator 가 . ,  
 System Frozen Message 가 가 . Message  
 Envelope Sender .

- **sender\_verify** : SMTP MAIL Envelope Sender .
- **sender\_verify\_fixup** : Envelope Sender 가 Header 가  
 Header Envelope Sender .
- **sender\_verify\_hosts** : Domain Envelope Sender .
- **headers\_sender\_verify** : Header 가 .

Option Main Section Option .

sender\_verify

SMTP MAIL Envelope Sender 가 . DNS Lookup  
 Host Message . Exim Envelope Sender . Local  
 (local\_domains ) Local-part 가 .  
 : Mailman Mailing List , Mailing List Local-Part 가 .  
 Mailman Mailing List List . [13](#)  
[14](#) Command Line 가 .

sender\_verify\_fixup

Envelope Sender 가 Message Header sender:, reply-to From  
 가 Envelope Header Message  
 . Header .

X-BadReturnPath: abc@abc.example rewritten  
 as xyz@good.example using From header

Local Network Host Mail Host  
**sender\_verify\_hosts** Option . pcharley.net Host Mail  
 Host .

sender\_verify\_hosts = ! \*.pcharley.net

Exim Envelope Sender , Bounce Message Sender 가 가 , Sender 가  
 Message . Sender  
 Message . Envelope Sender  
 . headers\_sender\_verify\_errmsg headers\_sender\_verify 가 Option .  
 Sender 가 Message Header Sender:, Reply-To:, From:  
 가 Message . SMTP  
 Message Header .

headers\_sender\_verify

Incoming SMTP Message Header Sender:, Reply-To:, From:

### 5.5. Option

- **smtp\_banner** : SMTP Message
- **ignore\_errmsg\_errors** : Mail frozen
- **headers\_add** : Transport Section Outgoing Message Header Header Line  
가 .
- **rbl\_domains = rbl.mail-abuse.org/reject : dialups.mail-abuse.org/warn** : Spam mail Online List .

```
smtp_banner = "${primary_hostname} Secure SMTP Server Ready.."
```

SMTP Message Option .

```
smtp_banner = $primary_hostname ESMTP Exim $version_number \
#$compile_number $tod_full
```

Server .

Message Frozen . frozen Message System  
Administrator 가 가 Server **ignore\_errmsg\_errors**  
Option Setting 가 . Option Setting Message  
frozen .

```
headers_add = "\
X-Organization: Debian GNU/Linux Network World\n\
X-pcharley-say: Faith be to human being forever and ever..."
```

Header X- 가 Header Line System Administrator 가  
Transport Section **local\_delivery:** **remote\_smtp:**  
Message Header Line 가 .

```
rbl_domains = rbl.mail-abuse.org/reject : dialups.mail-abuse.org/warn
```

MTA Filter 가 . Administrator 가 MTA filter 가  
Mail 가 . ,  
Spam Mail MTA Filter 가 가 가 .  
Spammer Online List MTA 가 Spam Mail Blocking  
가 . 가 ,  
Mail 가 .  
가 . rbl

## 6 . Section

Main Section Transports, Directors, Router Section **eximconfig**  
 가 . Transports Section Header 가  
 . 3 Exim , Exim section .

- **main** : Mail .
- **director** : Router Message . Mail 가 Main  
 local\_domains . Local 가  
 ( forwarding ) Router 가 .
- **router** : Director Message . Mail 가 Main  
 local\_domains . Mail Hub, Mail Gateway Mail  
 Relaying .
- **transport** : Director, Router Message .



## 6.1. Message Header 가

Mail Local remote 가 . Local /var/spool/mail/ Spool  
 Message , Remote SMTP MTA Message .  
 Message Header 가 Driver Header 가 .

```
local_delivery:
  driver = appendfile
  group = mail
  mode = 0660
  mode_fail_narrower = false
  envelope_to_add = true
  return_path_add = true
  file = /var/spool/mail/${local_part}
```

**eximconfig** Exim Local .  
 가 .

```
headers_add = "\
  X-Organization: Debian GNU/Linux Network World\n\
  X-pcharppley-say: Faith be to human being forever and ever..."
# appendfile transport Spool quota
# Spool quota 가
quota_is_inclusive = false
quota = 100M
quota_warn_threshold = 95%
quota_warn_message = "\
  To: $local_part@$domain\n\
  Subject: Your mailbox exceed!!!\n\
  This message is automatically created by mail delivery software.\n\n\
  The size of your mailbox has exceeded a warning threshold that is\n\
  set by the system administrator.\n"
```

headers\_add . Message Header X- RFC  
 가 . Main section quota  
 . Remote Header 가 .

```
remote_smtp:
```



## 7.1. Main Section

**local\_domains** Main Domain Virtual Domain .

```
local_domains = localhost : pcharley.net : virtual01.com : virtual02.com : virtual03.com
```

Setting , Service Virtual Domain Exim local\_domains  
inetd Exim  
Exim **dbm** **Berkeley DB** . **dbm**

/etc/exim/ virtual file Virtual Domain .

```
virtual01.com
virtual02.com
virtual03.com
```

**exim\_dbmbuild** virtual file dbm 가 .

```
exim_dbmbuild /etc/exim/virtual /etc/exim/virtual_dbm
```

dbm 가 **local\_domains** setting .

```
local_domains = localhost : pcharley.net : dbm;/etc/exim/virtual_dbm
```

**dbm;** 가 DBM .

## 7.2. Director Section

Main Section **local\_domains** setting director Driver setting .  
director section **real\_local** **system\_aliases** **virtuals** Driver 가 .

```
virtuals:
  driver = aliasfile
  domains = dbm;/etc/exim/virtual_dbm
  file = /etc/exim/exim_virtual/$domain.aliases
  search_type = lsearch
  no_more
```

**domains** virtuals director 가 virtual domain(virtual01.com, virtual02.com, virtual03.com)

**no\_more** virtual domain local-part 가 , virtual domain Message 가  
director Driver . Exim section(director, router,  
transport) driver . virtual domain driver  
가 **no\_more** .

**file = /etc/exim/exim\_virtual/\$domain.aliases** virtual domain aliases  
가 .

```
/etc/exim/exim_virtual/virtual01.com.aliases
/etc/exim/exim_virtual/virtual02.com.aliases
/etc/exim/exim_virtual/virtual03.com.aliases
```

```
/etc/exim/exim_virtual/virtual01.com.aliases
```

```
webmaster: pcharley
admin: pcharley
postmaster: pcharley
```

**webmaster@virtual01.com** Mail **pcharley@pcharley.net** aliasing .

### 7.3. Envelope

Virtual Domain Setting Message Message Envelope  
Message Envelope Virtual Domain Message  
Remote Host **(Route)** 가 .

Virtual Domain **virtual01.com** Message example01.host local-part  
/etc/exim/exim\_virtual/virtual01.com.aliases  
Message Envelope .

```
webmaster: pcharley@example01.host
admin: pcharley@example01.host
postmaster: pcharley@example01.host
```

, **webmaster@virtual01.com** Message aliases file  
**pcharley@example01.host** Route . **pcharley@example01.host** Message Header **To.**  
**webmaster@virtual01.com** , **Envelope-to:** aliasing Route

pcharley@example01.host 가 Envelope , , Envelope-to:  
 Virtual Domain webmaster@virtual01.com 가 .

Main Section Virtual Domain . Director Section **Virtuals Driver** **transport** Option  
 가 .

```

virtuals:
  driver = aliasfile
  domains = dbm;/etc/exim/virtual_dbm
  transport = virtual_smtp <-- 가
  file = /etc/exim/exim_virtual/$domain.aliases
  search_type = lsearch
  no_more
  
```

Domain alias file 가 . alias file local-part  
 . Domain Route transport Driver 가 .  
 Transport Driver Message 가 Host .  
**virtual\_smtp** Driver Transport Section .

```

virtual_smtp:
  driver = smtp
  hosts = ${lookup{$domain}dbm{/etc/exim/virtual/routes}{$value}fail}
  
```

/etc/exim/virtual/routes file .

```

virtual01.com: example01.host
virtual02.com: example02.host
virtual03.com: example03.host
  
```

**hosts** Exim Host List . Message 가 local\_domains  
 가 Exim Message Router Section . Router Section  
 Driver Host List Router Section Host List [\[1\]](#)  
 . Host List Router Section Exim  
 Transport Section . Router Section Host List 가  
 Transport Section Host List .  
 Router Section DNS Host Route . Domain ,  
 가 Route 가 가 . Transport Section **Hosts\_override**  
 Router Section Host List **Hosts** Host List  
 가 .

Hosts Option 가 Host 가 Hosts Host  
 List 가 .  
 Virtual Domain , Router Section Director Section Transport Section  
 Remote Host Local-part Host  
 가 . Hosts Host Hosts  
 Virtual Domain /etc/exim/virtual/routes : Domain  
 : Host Host 가 .  
 Host Virtual Domain Message Envelope Virtual Domain  
 (webmaster@virtual01.com) .

[1] Host .  
 Domain , Host Domain Host .  
 example.com Domain Mail DNS MX Record Domain  
 . MX Record mail.example.com 가  
 mail.example.com Host 가 .

#### 7.4. Virtual Domain Aliases

Virtual Domain Aliases . Virtual Domain 가  
 Aliases Aliases .  
 Aliases Aliases 가 .  
 Aliases local-part 가 .

/etc/exim/exim\_virtual/virtual01.com.aliases

```
webmaster: pcharley
admin: pcharley
postmaster: pcharley
```

/etc/exim/exim\_virtual/virtual02.com.aliases

```
webmaster: test
admin: test
postmaster: test
```

, Aliases Virtual Domain **webmaster** Mail  
aliasing 가?

**include\_domain** Director Section virtuals Driver 가 .

```
virtuals:  
  driver = aliasfile  
  domains = dbm;/etc/exim/virtual_dbm  
  file = /etc/exim/exim_virtual/virtual_aliases  
  search_type = lsearch  
  include_domain  
  no_more
```

**include\_domain** Aliases Local-part Domain . **include\_domain**  
2 Aliases .

/etc/exim/exim\_virtual/virtua\_aliases

```
webmaster@virtual01.com: pcharley@pcharley.net  
admin@virtual01.com: pcharley@pcharley.net  
postmaster@virtual01.com: pcharley@pcharley.net  
webmaster@virtual02.com: test@pcharley.net  
admin@virtual02.com: test@pcharley.net  
postmaster@virtual02.com: test@pcharley.net
```

## 8 . Message Error Retrying( )

8.1. [Error](#)

8.2. [Remote Error](#)

8.2.1. [Host Error](#)

8.2.2. [Message Error](#)

8.2.3. [Recipient Error](#)

8.2.4. [Error](#)

8.2.5. [Host](#)

8.3. [Error](#)

8.4. [Routing Directing Error](#)

8.5. [Retry](#)

8.5.1. [Rule](#)

8.5.2. [Error](#)

8.5.3. [Retry Rule](#)

8.6. [Retry](#)

8.7. [Retry](#)

8.8. [Retry Data](#)

8.9. [Host](#)

8.10. [Ultimate Address Timeout](#)

8.11. [Host](#)

8.11.1. [Intermittently Connected Host Mail](#)

8.11.2. [Intermittently Connected Host Exim](#)

8.11.3. [Intermittently Connected Host Daemon](#)

8.11.4. [Intermittently Connected Host Incoming Mail](#)

### 3.1 (Exim) Message

Error 가 Sender Bounce .  
 Temporary Error . Temporary Error . Temporary  
 Error 가 가 가 . Host 가 Down , Network  
 . MTA Message 가 Bounce Message  
 가 . Message  
 Message Message ( Message  
 Sender Bounce ) rule( ) . Temporary Error 가  
 Message Exim 가 .

: Retry . [Exim](#) Retry Chapter  
 . Retry Mail Server Retry Rule  
 Spam Mail

Exim Spam Mail

Exim  
 Retry Exim Mail Server

### 8.1. Error

Message Resource 가 .

MTA **Message-Based Retring**(Message )  
 Message , Remote Host 가 Down MTA  
 Message Down Remote Host Resource



Exim **Host-Based Retrying**(Host )  
 Host 가 Down , Message , Exim  
 가 Host Message .  
 Exim **Hostname** **IP** , Host 가 IP 가  
 IP .  
 Temporary Error Exim spool **db** **Retry** **hints database** [11]  
 database **exim\_dumpdb** error ,

Exim exim.conf  
 , 가 가

[11] Exim Remote Host Down , Data **hints** Data  
 hints Exim , Remote  
 Host Down **hints** , Exim  
 Message 가 ,  
 가 .

**hints** Data 가 , Exim system IO Call  
**hints** 가 .

**hints** Data Exim Spool db .  
**hints** Data DBM . Exim 4  
**hints** database .

- Retry database Host, Mail Address, Message Temporary Error  
 database Error , , 가 ,  
 가 .
- , Host Message list 가  
 database 가 Database Message 가  
 update . data Hostname IP (key) Message ID List 가 .  
 database Transport Section **wait - (Transport  
 Driver)** 가 .
- **reject** Database Message Database  
 RFC SMTP Client 가 .
- Database SMTP **ETRN** . queue runner

process Domain Mail Client Host

**ETRN** Client 가 Dial-up host Database **ETRN**

queue runner process 가

**db** DBM **Retry**

hints , SMTP , **wait-** hints . system ,

**Shared lock** Hints access . , Temporary

Error 가 , hints update Process

access 가 .

## 8.2. Remote Error

( ) Remote host 3

Error 가 Remote : **Host Errors, Message Error, Recipient Error**

### 8.2.1. Host Error

Host Error Message Message Recipient ,

- Remote Host
- 
- Remote Host Error .
- **HELO EHLO** Remote Host Error .
- . Message dot(.) Message Error .
- I/O Error
- **SMTP** session . **MAIL, RCPT** Message dot Message Error

Remote Host 가 **HELO, EHLO** **5xx SMTP** Error code ,

Host Route Message Sender Bounce .

Host Error Error . Remote Host 가 Error ,

Host Route . Error 가 Host Retry Data 가 ,

Message Message List [\[1\]](#) 가 . Process 가 ,

List Exim Hint Database . List

Message **SMTP** Message Remote Host

### 8.2.2. Message Error

Message Error Message 가 Host , Message .  
 Message Error Message , .

- **MAIL, DATA** Message dot Error Code ,
- **MAIL** .
- Message dot . **Data**  
 Host Error .

Temporary Message Error Host Route Message Delay . Host Retry Data  
 . Host Message ID 가 Retry . Message Error 가  
 Message List 가 . Message Error Retry Message 가  
 Host . Host Route Message  
 . Message Error 가 Mail

, Remote Host 가 **EHLO** **SIZE** , Exim **Mail** **SIZE=nnn** 가 .  
 Remote Host 가 Exim **MAIL** [\[2\]](#) Message  
 Error . **SIZE** 가 , Host  
 Message . Message 가 Exim  
 Exim Temporary Message Error , Message .  
 Message Message Error Host ,  
 Resource Message 가 Sender Bounce .

### 8.2.3. Recipient Error

Recipient Error Message Recipient . Recipient Error .

- **RCPT** Error code
- **RCPT**

Temporary Recipient Error , , Routing Retry Data 가 .  
 Data Routing , Queue Delay . Delay  
 Message , Queue , Message Recipient Error  
 Delay 가 Recipient Message  
[\[3\]](#) , Message 가 , Message 가

Message Message Error 가 List 가 . Recipient  
 Recipient Recipient .  
 Recipient **SMTP** Session . Session

가 , , Recipient  
Delay , Recipient 가 가 , 가  
Recipient , Recipient 가 .

#### 8.2.4. Error

Host MAIL Temporary Error 가 . Exim  
Message Error , Message Error Host Error , Host  
Retry Data . Exim [4] 가 ,  
Retry Data 가 .

MAIL, RCPT 가 Remote Host  
Procedure . Exim MAIL, RCPT 가  
Procedure 가 , MAIL, RCPT Temporary Error .  
dot , Line 가 binary zero ,  
Message . Message Error

Host 가 Host Error . MAIL, RCPT  
dot 가 , 가 SMTP  
Host Error 가 .

MTA 가 Message , dot 가 . 5xx  
RFC . Host Message Delay ,  
Exim host Error Message Error .

#### 8.2.5. Host

Temporary Error , Host IP 가 , [5] Host  
IP 가 가 Retry Data 가 .  
Recipient Error Retry Data 가 . , Message

[1] List Error 가 Host . Message List Host  
Transport Route . , Transport SMTP Driver 가 .

[2] Temporary( ) .

[3] "Message too big for this recipient"가 가 .

[4] 3.35

[5] MX Record 가 가 .

### 8.3. Error

Temporary Error Remote ; Temporary Error Local .  
 Local Error 가 2 가 가 .

- Quota Mailbox .
- Pipe .

Retry Mecanism Remote Delivery Error , Local Retry Queue  
 Queue ( Message  
 ), 가 Local Address , Director Section Local

, Local Message 가 ( , Quota  
 Filter Error 가 ) , Local Temporary  
 , Retry Data , Local 가 ,  
 Queue .

### 8.4. Routing Directing Error

Temporary Error Routing Section Directing Section .

- DNS : "try again" DNS Error. 가 DNS 가 Down ,  
 Network . Zone DNS Temporary Error  
 가 .
- Local Database : DB Server 가 Down , .
- Exim

Retry 가 , Directing Section Routing Section .  
 Directing , Queue . Retry 3 가 ( ,  
 Routing, Directing) . snark.example Domain Routing  
 snark.example Host , Retry  
 Data , Domain Routing, Directing, Retry

### 8.5. Retry

Temporary Error                      Exim                      가                      Rule  
 Retry Rule                      Part                      :                      , Error Name,                      Retry                      List.  
                     Rule                      .

```
=====
*                      *                      F,2h,15m; G,16h,2h,1.5; F,4d,8h
=====

*                      ->                      Domain

*                      ->                      Error

F,2h,15m                      ->                      2                      15

G,16h,2h,1.5                      ->                      1                      ; 16                      1.5                      가

F,4d,8h                      ->                      4                      8
```

Retry Rule

8.5.1. Rule

Retry Rule                      local-part@domain                      Domain, \*                      Wildcard Domain, Domain List                      Domain                      ,  
                     Local Domain                      .                      가                      . Local-part

Rule                      ,                      Error                      가                      Exim                      가가                      , Exim                      Retry  
                     , Temporary Error                      Error                      , Message                      Bounce                      .  
                     Retry Rule                      \*                      Wildcard                      ,                      Retry Rule  
                     Error                      .

Remote Domain                      , Routing                      가                      (DNS                      )                      Retry Rule                      , Retry  
                     Line                      Domain                      Test                      .                      , Remote                      (                      )  
                     Retry Rule                      Retry                      Line                      Remote Hostname                      Domain  
                     Test                      .                      , a.b.c.d                      MX Record 가                      :

a.b.c.d	MX	5	x.y.z.
	MX	6	p.q.r.
	MX	7	m.n.o.

Retry Rule :

p.q.r	*	F,24h,30m;
a.b.c.d	*	F,4d,45m;

Host **p.q.r**                      **xyz@a.b.c.d**                      Retry                      Rule                      .                      Domain **a.b.c.d**

Host                      Rule                      .                      **a.b.c.d**                      Routing                      Temporary Error

Rule

Remote Domain                      Host 가                      ,                      Host                      IP

가                      . Retry Algorithm                      Domain                      .                      IP

Host 가 2                      IP                      가                      가 Down                      , Exim

Down                      IP                      Retry Data                      ,                      .

IP                      ..:)

Local Domain                      , Directing                      Local                      ,                      (user@domain)

local-part 가                      Retry Rule                      가                      .                      ,

Local-part 가                      ,                      local-part                      .                      , Retry Rule                      .

lookingglass.example	*	F,24h,30m
----------------------	---	-----------

Retry Rule                      Local Domain                      Remote Domain                      Domain                      **lookingglass.example**

alice@lookingglass.example	*	F,24h,30m
----------------------------	---	-----------

lookingglass.example Domain                      Local Domain                      ;                      Local-

part **alice**                      Temporary                      ,                      Local-part                      Domain                      .

### 8.5.2. Error

Retry Rule                      2                      Error                      ,                      Error                      \*                      .

#### 8-1. Retry Rule                      Error                      Error

Error	Error
<b>quota</b>	Local                      Quota
<b>quota_time</b>	Local                      Quota                      , <b>time</b> Mailbox                      .
<b>refused_MX</b>	MX Record                      Host                      .
<b>refused_A</b>	MX Record                      Host                      .(Address Recrod                      )

refused	
timeout_connect	
timeout_DNS	DNS
timeout	

Error                      Retry Algorithm                      .

### 8.5.3. Retry Rule

Retry Rule                      ,                      Retry                      .

Semicolon(;)                      가                      .

F,3h,10m; G,16h,40m,1.5; F,4d,6h

Semicolon                      .

,cutoff time,                      ;

F,8h,15m;

,                      F, Cutoff Time                      8                      ,                      가                      .  
 Retry                      Algorithm                      . Cutoff Time                      Algorithm                      가                      가

Algorithm                      .

- F                      Retry                      . Retry                      .  
                     15m                      15                      Retry                      .
- G                      Retry                      Retry                      가                      .  
                     Retry                      ,                      가                      .

G,16h,40m,1.5;

- 40m                      Retry                      40                      ,                      1.5                      가                      .  
                     1.5                      가                      Retry                      40 , 60 , 90 ...                      가                      .

Retry Rule                      .                      ,                      Error                      .

Retry                      .                      Temporary Error                      Error                      .



## 8.6. Retry

Retry Rule Retry Hints 가 . Exim Retry  
 . , Queue Runner Process Delay Message  
 . Queue Runner Process Retry 가 가  
 . Message 가 Temporary ,  
 가 Local , 가 Remote , Remote  
 Retry 가 가 Host Message  
 가  
 Message 가 , Retry Queue Runner  
 Process . , Queue Runner Process 가 Message 가  
 , 5 Retry .

## 8.7. Retry

pcharley.net Local Domain , Retry Rule .

pcharley@pcharley.net	quota	F,7d,3h
pcharley.net	quota_5d	
pcharley.net	*	F,1h,15m; G,2d1h,2;
remote.net	*	F,12h,30m;
*	refused_A	F,12h,20m;
*	*	F,2h,15m; G,16h,1h,1.5; F,5d,8h;

Rule Over Quota Error 가 pcharley@pcharley.net Mail .  
 Retry 7 3 . Rule pcharley.net Local-part Over Quota  
 Error 가 , Mailbox 가 5 Check . Retry ,  
 Message Sender Bounce . 가 Mailbox 5 Check , Rule  
 Rule

Rule pcharley.net Mail ; Retry 1 15 ,  
 1 2 2 Retry 가 Retry 가 .

Rule Domain remote.net Retry , Domain remote.net Local  
 Remote . , Rule MX Recrod Host  
 Retry , Domain Retry . Error Host  
 SMTP Port . Host 가

가 , SMTP  
 , Host Workstation  
 Sender Message Bounce  
 Retry Rule Asterisk(\*)가  
 Error Rule 2 15 Retry  
 16 1.5 Retry 가 Retry 가 , 5 8 Retry 가

### 8.8. Retry Data

Message Retry Host Retry Exim 가 ,  
 가 Host Domain  
 MX Secondary Host 가 . Domain Primary Secondary Host 가 ,  
 Network Down . Host Retry Data . Network ,  
 Mail Secondary Retry , Primary Server . Retry  
 Data Message . Secondary  
 가 . Exim Retry  
 , Exim Host 가 Down .  
 Secondary Message Retry Data Bounce  
 가 . , Retry Data Message , Retry Data  
 , Exim Retry Hints database Data . Exim  
 Data , Data **retry\_data\_expire(7 )**  
 Retry Data . , Host 7 , Host  
 Retry Data Exim Host Message 가 .  
 , 가 , Retry  
 Host 가 , Retry 가 .  
 Host Route Message 가 . Host , 7  
 Message 가 , Retry Data .

### 8.9.

( Retry Algorithm Cutoff Time ), Exim  
 가 (Message 가  
 ). Routing, Directing, Local , Exim

가 , Message Bounce , Remote Domain IP  
 , Host Route , Remote .  
 IP Cutoff Time , Remote . **pcharley.net** Domain  
 MX Record **pcharley-host01.net** **pcharley-host02.net** Route , Retry Rule

```
pcharley-host01.net * F,1d,30m;
pcharley-host02.net * F,5d,2h;
```

**alice@pcharley.net** **pcharley-host01.net** Down **pcharley-host02.net** 5 Down

Queue 가 Message , Message 가 ,  
 가 가 Message ? 가 ?  
 Bounce ? Message 가  
 ?

가 , Message  
 . Local Resource 가 . Exim ,  
 Local . , Message Bounce .

Rmote (Remote Resource 가 )  
 Cutoff Time IP , Exim Retry Algorithm Retry Time  
 . IP Post-Cutoff Retry Time , Message Remote  
 Host Bounce . Message Bounce  
 . , " Host 5 Down Host

Message 가 IP Retry 가 , Exim Retry IP  
 , Message Bounce , Retry time

Retry Rule Retry ( 8 ) . Host Retry 가  
 , 가 Retry .  
 Retry Rule 가 가 .

```
* * F,2h,15m; G,16h,1h,1.5; F,4d,8h; F,4d1h,1h;
```

Rule 4 4 1 Retry . Rule .  
 Rule , Retry 8 , 1 .  
 Exim Host . 가 , Bounce

## Option

**delay\_after\_cutoff = false**

**smtp transport**, **delay\_after\_cutoff** 가 false, Domain Route IP 가  
 Cutoff Time, Exim Message IP  
 Message 가, Delay Domain  
 Message, **delay\_after\_cutoff** false **delay\_after\_cutoff** 가 True  
 IP, Message 가,  
 Bounce

### 8.10. Ultimate Address Timeout

Retry Rule Queue 가,  
 Queue Message 가, 가 Down Host,  
 Message 가 Message 가  
 가 Internet 가,  
 Message 가 Message Message 가, Host  
**Retry Clock**, Message  
 Message Queue, Exim 가  
**Ultimate Address Timeout** Rule

- Message 가 가 Retry Rule Cutoff Time Queue  
 , [\[1\]](#) Retry Time, 가 Host
- Temporary Error, Message 가 가 Retry Rule Cutoff  
 Time Queue, Retry Rule  
 Retry Rule

### pcharley.net Domain

```
pcharley-host01.net * F,1d,30m;
pcharley-host02.net * F,5d,2h;
```

, Exim **pcharley.net** Domain Message 가 5 Queue  
 , Retry Time, Host  
 Retry 가 Message Bounce

[11] Host Host 가 , Retry Rule Retry Rule

### 8.11. Host

Exim Internet Host Host 가  
Internet 가 Internet Host System [11]  
. Dial-up System Internet  
가 Remote Message Host Internet

Exim , Retry Mechanism , Exim  
, Intermittently Connected Host Server Retry 가 . Section  
가 . Exim

#### 8.11.1. Intermittently Connected Host Mail

Intermittently Connected Host Mail Internet Server  
Client Host Internet Server Message 가 .  
가 가 .

- Host Mail Server File . Host local-part  
Mailbox 가 , File . Server MTA Mail  
, Message . , Retry Rule

- Mail MTA Queue , Client 가 SMTP . Exim  
Retry .

Server Exim , Client Message  
가 . Exim Queue Message 가  
. Queue . Queue Exim  
. 가, , Queue 가 Message 가 :  
가 Message, Client Message.

dial-up Client Message Exim Queue ,  
. Intermittently Connected Host Retry

dial.pcharley.net \* F,5d,24h

Client 가 Online 가 , Message Queue 가 , Message Host Message 가 Queue SMTP Down . Host 가 Online Exim .

IP Retry Key , Intermittently Connected Host IP 가 , Exim Retry Mechanism . SMTP Transport no\_retry\_include\_ip\_address Retry Hostname . IP 가 Internet 가 가 . Intermittently Connected Host Transport 가 .

```
normal_smtp:
    driver = smtp

special_smtp:
    driver = smtp
    no_retry_include_ip_address
```

가 Router Host Router , Transport

```
lookuphost:
    driver = lookuphost
    transport = ${if match{$domain}{\\.dial\\.pcharley\\.net\\}$}{special_smtp}{normal_smtp}
```

DNS Routing dial.pcharley.net Domain special\_smtp transport 가 , Domain normail\_smtp 가 .

### 8.11.2. Intermittently Connected Host Exim

Intermittently Connected Client Host Exim Local Remote Domain Queue . Retry Mechanism . 가 , Domain List Queue\_remote\_domains , Local Network Host

```
queue_remote_domains = *
```

Remote Domain Queue . Host Mail Local Network , queue\_remote\_domains Domain .

```
queue_remote_domains = ! *.local.hosts
```

Internet , Queue

```
exim -qf
```

Routing , Message SMTP session [3] .  
Intermittently Connected Host Message smarthost . Message  
SMTP . Queue .

```
exim -qqf
```

, Queue . Routing .  
Retmote Temporary 가 가 , Exim Host  
Message List 가 Hints . Queue ;  
Message Routing , Host Message SMTP

Remote Routing queue\_remote\_domains  
queue\_smtp\_domains . client 가 Internet Remote  
Host Route 가 가 , IP , Smarthost Message  
Router .

```
remotes:  
  driver = domainlist  
  route_list = * 192.168.1.5 byname
```

/etc/hosts smarthost , IP . Client 가  
Offline DNS Lookup . queue\_remote\_domains Exim Message 가  
Routing . -qff -qf queue .

### 8.11.3. Intermittently Connected Host Daemon

Intermittently Connected Host Exim Daemon , Queue Runner Process  
가 . Exim -bd . 가 Loopback Interface MTA  
Message SMTP agent 가 , Local Network  
Host Mail Exim Daemon .

#### 8.11.4. Intermittently Connected Host Incoming Mail

Interent Incoming Mail SMTP , Server  
Message . Exim Remote Host Local Process 가  
Message 가 Message  
Mail Host . ,  
**smtp\_accept\_queue\_per\_connection** 가 0 .  
Incoming Message .

[1] Host Intermittently Connected Host .

[2] -M -R , ETRN .

[3] -qf Retry Time , 가 -q , -qf

## 9 . Rewriting Address

9.1. [Rewriting](#)

9.2. [Rewriting](#)

9.2.1. [Rewriting](#)

9.2.2. [Per-Transport Rewriting](#)

9.3. [Rewriting Rule](#)

9.3.1. [Rewriting Rule](#)

9.3.2. [Rewriting Rule](#)

9.4. [Rewriting Flag](#)

9.4.1. [Rewrite](#) [Flag](#)

9.4.2. [Rewriting](#) [flag](#)

9.4.3. [SMTP](#) [Flag](#)

9.5. [Debian Rewrite](#)



가 Exim , Message 가 Envelope  
 Header Header Line **Bcc:, Cc:, From:, Reply-To:**,  
**Sender:**, **To:** 가 Administrator ,

### 9.1. Rewriting

Rewriting 가 unqualified Domain 가 Envelop  
 Header Line , Message 가 **qualify\_domain pcharley.net**  
 Host :

```
$ exim pcharley
To: pcharley
...
```

unqualified local-part **pcharley** Envelope Header Line To: qualified  
**pcharley@pcharley.net** Host Message unqualified ;  
 Message unqualified , **sender\_unqualified\_hosts**  
**receiver\_unqualified\_hosts** 가 .

Rewriting Domain . **pcharley.net** Domain 가  
 Host Header

```
To: pcharley@host1
```

```
To: pcharley@host1.pcharley.net
```

, MTA Header Line routing , 가 Route  
 Message

, 가 Route , Message  
 Exim 가 Route , delay  
 가 Route Rewrite Process Rewriting

## 9.2. Rewriting

MTA Message Rewriting .  
 Exim Rewriting . Exim ; 가  
 , Domain Rewriting .  
 Rewriting 가 . Exim **Philip Hazel**  
 Rewriting , Domain . ,  
 Rewriting 가 Routing Tool , Rewriting  
 , Rewriting .

- **pcharley.net** Domain 가 가 Mail Domain Hostname Firewall  
 Host Mail Machine 가 Mail Gateway  
 . Gateway 가 Message Local Hostname .  
**pcharley@host01.pcharley.net** **pcharley@pcharley.net** . Rewriting Rule

```
*@*.pcharley.net $1@pcharley.net
```

- Host Login ID Local-part Rewriting . ,  
**pcharley@pcharley.net** **cho.dae.won@pcharley.net** . Rewriting  
 Rule .

```
*@pcharley.net ${lookup{$1}dbm{/etc/exim/realname}{$value}fail}@pcharley.net frsF
```

Rewriting Rule . Rewriting  
 가 가 .

Rewriting Message Processing . Rewriting Message 가  
 . Directing Routing ( , **aliasing** )가  
 Message 가 .

Rewriting 2 가 가 . **general** **per-transport** Rewriting .  
 가 . **General Rewriting** Message , **per-**  
**transport Rewriting** Transport 가 Message .

### 9.2.1. Rewriting

#### General Rewriting

Rule .

```
*@pcharley.net ${lookup{$1}lsearch{/etc/email-addresses}{$value}fail} frFs
```

Rule Rule Type , Exim 가 Rule ,  
 Rule .

- Message Sender , Header Line Message 가  
 Rewrite . **General Rewriting** Message 가  
 Unqualified 가 Host , Message Rewrite Qualified  
 Host Full Qualified Message .
- (aliasing forwarding), **smartuser** director **new\_address**  
 director **no\_rewrite** 가 Rewrite .  
 (router, director, system filter 가 ) Header Line **General**

### Rewriting

#### 9.2.2. Per-Transport Rewriting

Gateway 가 Mail Relay Host , Rewriting  
**General Rewriting** rule Site 가 Mail Relay  
 Host 가 Host 가 ,  
 Message Rewrite 가 가 . Exim  
 Message , Message 가 가 .  
 Message 가 Local Remote 가 , Remote Rewriting ,  
**General Rewriting** .

Exim Release 3.20 **Per-Transport Rewriting** . Rewriting  
 Transport Header Line Rewriting . **General Rewriting** , **Per-Transport**  
**Rewriting** Envelope Rewrite . Transport **return\_path** Envelop  
 Rewrite . Transport Rewrite .  
**Per-Transport Rewriting** Transport **headers\_rewrite** .

```
headers_rewrite = a@b c@d f : x@y w@z
```

, Header Line From: **a@b c@d** , Header-Line **x@y w@z** .  
 system filter 가 , Message Header Line Rewrite .  
 System Filter 가 , **General Rewriting** . , Router,  
 Director, Transport 가 Header Line 가 ,

### 9.3. Rewriting Rule

**General Rewriting**   **Per-Transport Rewriting** , Rule 가 ,  
 Exim Rule ,  
 가 Rewrite .  
 , Rule . Rule  
 Rule . Rule .  
 Rewriting Rule .

```
pcharley@host01.pcharley.net   P.C.Harley@pcharley.net
```

**General Rewriting** Rule ,   **Per-Transport Rewriting** Rule , **headers\_rewrite**

```
headers_rewrite = pcharley@host01.pcharley.net   P.C.Harley@pcharley.net
```

, Header Line .  
 , Wildcard   Rewriting Rule , .  
**pcharley.net** Domain 가   가 Rewriting Rule .

```
*@*.pcharley.net   $1@pcharley.net  

*@pcharley.net   ${lookup{$1}dbm{/etc/exim/realname}{$value}fail}@pcharley.net frsF
```

Rule   Hostname   Rule   Local-part  
 (/etc/exim/realname) , **pcharley.net** Domain   Rewriting  
 Rule   **frsF**   **Flag**   **Flag** .

### 9.3.1. Rewriting Rule

, Rule .

```
pattern   replacement   f l a g s
```

pattern   , Rule   Match   . Flag   , Rule  
 가 ;   flag   Rewriting .  
 (replacement)   Double quote("")   . quote 가 ,  
 quote .

### 9.3.2. Rewriting Rule

Asterisk(\*)가 , Match Rule  
 Rewriting Rule .

pcharley@pcharley.net \*

pcharley@pcharley.net Rewrite .

### 9.4. Rewriting Flag

Rewriting Rule Flag 가 .

- Header Line Envelope Flag : **E, F, T, b, c, f, h, r, s, t**
- Rewrite Flag : **Q, q, R, w**
- SMTP Flag : **S**

Header Line **Per-Transport** Rewriting Rule **E, F, S** T Flag .

#### 9.4.1. Rewrite Flag

Flag , **S** Flag 가 , Rewriting Rule Header Line  
 Envelope(**General Rewriting** ) Sender Recipient . , Rewrite Flag

#### 9-1. Flag

Flag	
<b>E</b>	Envelope Rewrite
<b>F</b>	Envelope From Rewrite
<b>T</b>	Envelope To Rewrite
<b>b</b>	Header Bcc: Rewrite
<b>c</b>	Header Cc: Rewrite
<b>f</b>	Header From: Rewrite
<b>h</b>	Header Rewrite
<b>r</b>	Header Reply-To: Rewrite
<b>s</b>	Header Sender: Rewrite

t	Header	To:	Rewrite
---	--------	-----	---------

```
*@*.pcharley.net      $1@pcharley.net
*@pcharley.net        ${lookup{$1}dbm{/etc/exim/realname}{$value}fail}@pcharley.net frsF
```

Rule	.	Rule	Header Line	<b>From:, Reply-to:, Sender</b>
Envelope	Sender(From)	.		

#### 9.4.2. Rewriting flag

Rewriting	4	Flag 가	.	Flag	Rule	;	가
Type	Match	.					

- **Q** : Rewrite 가 unqualified Local-part 가 . unqualified Local-part  
**qualify\_recipient** qualified . **Q** Flag 가 Rewrite Domain  
Qualifying Domain Rule

```
aaaa@domain.net      bbbb      Q
```

- , Flag Local-part
- **q** : Rule 가 Type  
Match q Flag
- **R** : Rewriting Rule 10 Flag ( Rewrite 가 ) Match Rewriting q Flag  
. R Flag Style 가 Gateway
- **w** : Header Line 가 Rewrite , Rewriting comment RFC822  
Item . Rule ,

```
pcharley@*.pcharley.net      admin@pcharley.net
```

```
From: P.C.Harley <pcharley@host01.pcharley.net>
```

```
From: P.C.Harley <admin@pcharley.net>
```

- Rewrite Rule, RFC822 Envelope, RFC822 Item, w Flag

```
pcharley@*.pcharley.net "\P.C.Harley Administrator\" <admin@pcharley.net> w
```

- 

```
From: pcharley <pcharley@host01.pcharley.net>
```

- 

```
From: "P.C.Harley Administrator" <admin@pcharley.net>
```

- Rewrite Rule, RFC822 Envelope, RFC822 Item

### 9.4.3. SMTP Flag

**S** Flag Rule **MAIL RCPT** SMTP Incoming Envelope  
 Rewrite Rule **S** Flag 가 Rule , Syntax  
 가 Rewrite Rule RFC821

**S** Flag 가 Rule 가 ,  
**\$local\_part, \$domain**  
 <> **MAIL RCPT** Match 가  
 Rewriting **MAIL RCPT** , Local Network SMTP Client  
 Error 가 SMTP 가

```
RCPT TO: internet:ceo@pcharley.net
```

```
 : <> internet: 가 Client  

  가 S Flag Exim
```

```
^\s*internet:(.*)$ <$1> S
```

**internet:** Match Rule

```
RCPT TO: <ceo@pcharley.net>
```





## 10 . Message Filter

- 10.1. [Filter](#)
- 10.2. [agent](#)
- 10.3. [Filter](#)
- 10.4. [System Filter](#)
- 10.5. [Filter File](#)
  - 10.5.1. [System Filter](#)
  - 10.5.2. [Filter](#)
- 10.6. [Significant Action](#)
- 10.7. [Filter Command](#)
- 10.8. [Filter](#)
  - 10.8.1. [Filtering](#)
  - 10.8.2. [Mail](#)
  - 10.8.3. [Mailing List](#) [Error Message Filtering](#)

## 10.8.4. [Message Filtering](#)

Fileter Exim Message Message

Filter Message

Filter Filter

- Forwarding .forward Filtering [\[1\]](#)

Filter Exim forwarding

Filter Filter , Filter 가

**\$local\_part, \$domain**

- System Filter Administrator . System Filter Filter Filter

System Filter Directing Routing , 가

. Message 가 , System Filter 가

**\$local\_part, \$domain**

List **\$recipients**

Filter Filter

[\[1\]](#) .forward Filter 가

### 10.1. Filter

Filter Forwarding

```
# Exim filter
deliver example@pcharley.net
```

```
Line .forward Filter 가 Filter
Message .forward Filter .forward
```

```
example@pcharley.net
```

```
.vacation.msg Home Setting 가
/usr/bin/vacation
```

```
# Exim filter
```

```
unseen pipe "/usr/bin/vacation $local_part"
```

```
pipe          Program          Pipe          Message          Program          .
Filter          $local_part          가          .

pipe          , unseen Exim pipe significant [1]          . Filter
Exim Message          . Message pipe
, Filter Mailbox . unseen Message pipe
.
.forward          .forward
```

```
\user01, | /usr/bin/vacation user01
```

```
, Vacation          Program          Exim Filter          .vacation.msg 가
Home          가 ,
```

```
# Exim filter
```

```
if personal then vacation endif
```

```
.forward          . if          가
, personal          .
personal Test Message 가          [2]          . Incoming
Message 가          , Filter Vacation . Vacation
Message Sender          .
Vacation Message Filter , Exim          . vacation Filter
significant action          .
if          가          . Header Line subject:          .
subject: 가 Mailbox , Message          .
```

```
# Exim filter
```

```
if $header_subject: contains "empire" or
    $header_subject: contains "foundation"
then
    save $home/mail/f+e
endif
```

**significant action** . Match Message Filter  
 . **save** **unseen** , Filter .  
 Filter . **\$tod\_full**

Wed, 16 Oct 1995 09:51:40 +0100

Filter **urgent** 가 Message , .

```

# Exim filter
if $header_subject: does not contain "urgent" and
    $tod_full matches "^(...),"
then
    save $home/mail/$1
endif

```

Match , **\$1** "()"가 .

junk Mail Domain Message 가 , Postmaster  
 Message . Filter .

```

# Exim filter
if $reply_address contains "@spam.site.example" and
    $reply_address does not contains "postmaster@"
then
    seen finish
endif

```

**finish** filter . finish **seen** **significant action** .  
 . 가 Match , Message .

가 Mailbox .

```

# Exim filter
if $local_part_suffix is "-foo"
then
    save $home/mail/foo
elif $local_part_suffix is "-bar"
then
    save $home/mail/bar

```

endif

[\[1\]](#)      **significant**      . **Exim Filter**      **significant**      **Significant**  
**action**    Filter      가      가      , **unseen**  
Message    Filter      **pipe**      가      .      **vacation**  
            Filter      .

[\[2\]](#)    Mailing List      Mail      .

## 10.2.      **agent**

System      Filter 가      . Filter      Message 가  
            List 가      ;      Message      List  
Filter      가      .      Filter

            가      , procmail      Agent      .  
procmail    Exim      가      ,      .

- Exim      Forwarding      Envelope Sender 가      Forwarding      ; Message  
            Redirect      .      Agent      Message 가 Redirect      Envelope  
Sender      Local      가      가      .
- Agent      가      Message      ,      [\[1\]](#)  
            가      .      ,      **bob**      **alice**      Message 가      ,      **bob**  
Message 가 procmail      **alice**      Forward      ,      Message 가      .      Exim  
Filter      Forward 가      Message
- ,      (      , Message 가 Pipe      ,      Return Code)  
            Agent      .      Exim filter      가      .

Exim filter      Agent      . 가

[\[1\]](#)    Exim      List      .  
Message      .      **postmaster**      **hostmaster**      Message 가      ,  
            alias      ,      Message      .      Pipe      direct

### 10.3. Filter

`.forward` Line forwarding list Filter . [\[1\]](#)

```
# Exim filter
```

```
.forward , Filter 가 Pipe File , forwardfile director  
address_pipe_transport address_file_transport
```

[\[1\]](#) Administrator 가 `forwardfile` director `filter` enable . `false`

### 10.4. System Filter

System Filter Filter . 가 direct route  
, , System Filter Option Main Section .

System Filter Filter `message_filter` Option enable .

```
message_filter = /etc/exim/filter/exim.filter
```

```
Filter Pipe file, Reply Message ,  
Transport 가 Option . Option .
```

```
message_filter_directory_transport directory  
message_filter_file_transport file  
message_filter_pipe_transport pipe  
message_filter_reply_transport Reply
```

```
Filter save Directory . (/)  
가 , message_filter_file_transport Transport 가 ; ,  
Directory 가 , message_filter_directory_transport 가 .
```

```
message_filter_user message_filter_group System Filter 가 가 Uid Gid .
```

### 10.5. Filter File

Filter , Filter . Exim Filter

**.forward**

Filter Message , Message 가 . new-filter  
Filter 가 가 . Filter

```
exim -bf new-filter < test-message
```

**-bf** Option Exim Filter . test-  
message 가 . Filter Message ,  
Message Header Line Message Folder **From**  
Message . Header Line 가 .  
Error Filter Filter Message Exim  
List . , Filter 가 , Message  
**user01@example01.com** , /home/user02/mail/archive 가 .

```
Deliver message to: user01@example01.com  
Save message to: /home/user02/mail/archive
```

Filter 가 ; Forwarding 가  
Filter 가 , **-v**  
Option 가 . Exim  
**testprint**  
Exim filter Test , Text String , 가  
Escape . , Text String Newline 가 **\n** .  
Filter 가 , Exim Message Envelope . Sender Filter  
**-f** Option Sender .

```
exim -bf new-filter -f test@example.net < test-message
```

**-f** Option , Message Line Message Folder  
**From** [1] , Sender Message **-f** Option ,  
Message **From** .  
Message **Retrun-Path** Header 가 , **Retrun-Path** Envelope Sender .  
Option Envelope . **-bfd** Option Domain .  
**-bfl** Option Local-part .

**-bfp**      **-bfs** Option    local-part    **Prefix**      **suffix**      .

, Filter 가 Message    Source      test      , [\[2\]](#)

.      **-oM**      Command-line Option      가      . **-oMa**

Remote Host

### 10.5.1. System Filter

System Filter      Filter      .      **-bf**      **-bF** Command-line Option

.      Exim      Filter      System Filter

### 10.5.2. Filter

Filter      ;      , Pipe

Message      .      Filter      가      .

, 가      ,      Message      Filter      .      ,      가

Fileter      Message      ,      , Error Message

.      가      .      Message      Message

,      가      .      ,      Message      Sender      ,

Postmaster 가      Message

Filter 가      Line      Filter

```
if error_message then finish endif
```

Message      .      Filter      ,

Message      .      가      ,      Line

Filter      가      .

[\[1\]](#) Header Line    **From:**

[\[2\]](#) Message      Host      IP

### 10.6. Significant Action

Message      Filter      , Filter      가      ?      Filter

**Significant action**    가    가      .      Filter      ,      **Significant Action**      ,



Filter , System Filter ,  
**Significant Action** , .

Significant Action , Exim Filter File  
Filter , Director , Message local mailbox  
System Filter director route .

**Significant action** deliver, save, pipe .

Filter 가 Filter Director

```
deliver hatter@wonderland.example
```

unseen , Significant action

```
unseen deliver hatter@wonderland.example
```

unseen Filter , Message 가  
Message System Filter .

Filter [\[1\]](#) Significant action seen Significant action  
finish Filter ; Significant action  
filter Significant action ,

```
seen finish
```

[\[1\]](#) Significant action Message .

## 10.7. Filter Command

Filter 가 가 . [Exim](#) .

```
add 가  
deliver email  
fail Error Message ( System Filter )  
finish Filter  
freeze , Administrator 가 ( System Filter )  
headers header line 가 ( System Filter )
```

```

if
logfile      log file
logwrite     log file
mail         reply Message
pipe        pipe
save        file
testprint
vacation     Mail

```

## 10.8. Filter

Exim Filter . Exim Filter

### 10.8.1. Filtering

Message 가 Exim , Forward Alias Route Director Driver 가  
 가 . Message 가 Filter 가 Mail System  
 가 가 . Filter File 가 가 .

```

if not first_delivery
then
  finish
endif

```

Message 가 Filter . finish Significant  
**action**

### 10.8.2. Mail

가 가 . [11] Filter Mail 가 Mail  
 Administrator 가 Setting Filter

Local Domain **example.com** , Filter File **/etc/exim/filter/local.filter** 가 .

```

# Exim filter
if not first_delivery
then

```

```

finish
endif

if $header_from: contains "@example.com" and $header_from: does not contain "root@"
then
    unseen save /home/all-mail/local.mail
elif $header_to: contains "@example.com" and $header_to: does not contain "root@"
then
    unseen save /home/all-mail/remote.mail
endif

```

Filter File	<b>if</b>	.	Header Line	<b>From:</b>	Domain
<b>@example.com</b>	Local	Remote	Mail		/home/all-mail/local.mail
Message	.	root	System	Administrator	Mail
			.	Local	Mail

Message 가	<b>if</b>	Filter	<b>elif</b>	Message	.	Header
Line <b>To:</b>	Domain	<b>@example.com</b>	Remote	Local	Mail	
/home/all-mail/remote.mail	Message	.		root	.	

가	, <b>unseen</b>	. <b>save</b> Filter	<b>Significant action</b>	<b>unseen</b>	<b>save</b>
Filter	.	가	.	<b>unseen</b>	
Filter		가	.		

exim.conf	Filter File	. exim.conf	<b>Main</b>	가
-----------	-------------	-------------	-------------	---

```

message_filter = /etc/exim/filter/local.filter
message_filter_file_transport = local_delivery

```

<b>save</b> Filter	Message	Local	<b>message_filter_file_transport =</b>
<b>local_delivery</b>	.	<a href="#">10.4</a>	.

### 10.8.3. Mailing List Error Message Filtering

Mailing List , Error Message [\[2\]](#) Filtering 가 .

Mailing List 가 **mailing@mailing.list** 가 , Filter File .

```

if not first_delivery
then

```

```

finish
endif

if $header_to: contains mailing@mailing.list and error_message
then
seen finish
endif

```

```

finish      Significant action          seen          Significant action
.

10.8.4.      Message Filtering

Spam Mail    Virus Mail  Filtering      Message  Header
Filtering
.

Exim Message      가
Filtering          Filtering
.
Filtering          가
.
Filtering          Rule
Incoming Message 가
가
.

```

```

Local Domain : example.com
Local Domain      MX Record : mail.example.com
Mail Server  IP      : 192.168.1.105
IP           : 192.168.1.1 - 254

```

Virus Mail Filtering      Filter Rule

```

if not first_delivery
then
finish
endif

if $sender_helo_name: contains "mail.example.com" and $sender_fullhost: does not match
"(192\.\168\.1\.\105|127\.0\.0\.1)"
then
logfile /var/log/exim/filter.log
logwrite "$tod_log $message_id virus(Sender) detected in mail from host

```

```

$sender_host_name[$sender_host_address]"
    seen finish
endif

```

Rule

### \$sender\_helo\_name

```

Remote Host      Message 가      , HELO      EHLO      Item
$sender_helo_name      . exim Command Line Option -bs      -bS      Local
SMTP      Message 가      , HELO      EHLO 가      가      .

```

### \$sender\_fullhost

```

Remote Host      Message 가      ,      Host Name      IP      .
    Square Bracket([ ])      IP      .      , log_incoming_port 가
    , Remote Host      Port      가 IP      .      Format      Host 가 HELO
EHLO SMTP      , Hostname      IP
.      Host      Host      ;      ,
.      Host      HELO      EHLO      .
Host      Host      Square Bracket      IP      .

```

```

Rule      $sender_helo_name      $sender_fullhost      Sender      Host      .
Sender      FQDN      $sender_helo_name      . Local Domain      MX Record
.      ,      \[3\] $sender_helo_name      Mail
Server      FQDN(DNS      MX Record      )      .      $sender_fullhost
Mail Server      IP      Localhost IP 가      .      $sender_helo_name      Mail
Server      FQDN      $sender_fullhost      Remote Host      IP 가      Sender
Host

```

```

Rule      Client      HELO      EHLO      가 mail.example.com      , Client Host      IP 가
192.168.1.105      127.0.0.1      ,      Message 가 Rule      Match      /var/log/exim/filter.log
Match      Log      Message      . Sender Host 가      Message
Virus      Host      . Sender Host      Virus      Local Domain
example.com      DNS      MX Record      HELO      EHLO SMTP
example.com Domain      Virus 가      Message      . logfile, logwrite Filter
Exim Site      Online

```

Local Domain Message Filtering

```

if $header_from: contains "@example.com"
    and $sender_fullhost does not match "(192\.168\.1\.[1-254]|127\.0\.0\.1)"
    and $received_protocol does not match "(smtp|local)"
then
    logfile /var/log/exim/filter.log
    logwrite "$tod_log $message_id virus(Sender) detected in mail from host
$sender_host_name[$sender_host_address]"
    seen finish
endif

```

Virus Mail Filtering

Filtering Rule

### \$received\_protocol

Message 가 , Message Protocol  
 Protocol 3 가 (smtp, asmtplib)가

#### smtp

SMTP Protocol.

#### asmtplib

SMTP Protocol.

#### local

Message .

Message 가 , Relay Rule .  
 Rule Incoming Message 가

Rule \$header\_from:, \$sender\_fullhost \$received\_protocol

Sender . Rule Rule .

Incoming Message Sender 가 Local Domain , \$sender\_fullhost

가 IP Localhost IP . Remote IP Message 가

Protocol . Protocol Rule .

Rule , Incoming Message Sender 가 Local Domain

가 .

- 가 IP Message .

- Mail Server 가 Smarthost , 가 Relay Message
- 가 Relay IP Message
- Local SMTP Message.

가 Incoming Message Local Message  
 가 Incoming Message  
 Sender 가 Local Domain Incoming Message 가  
 Rule , [4] IP 가  
 Message Relay Message **\$sender\_fullhost** IP  
 Rule Match 가 Relay Message  
 Message Message Protocol **asmtpt**  
 Rule Match Local Message Protocol **local** Rule  
 Match , Message가 Protocol **\$received\_protocol**가 ,  
 Relay Message Message

Filter **contains match** . **contains**  
 Matching , **match** Matching  
[Exim Site Online](#)

[1] Mail 가 가  
 Mail

[2] Error Message Message Bounce Message  
 Error Message **Envelop sender** 가 , Spam Mail **Envelop sender**  
 Header Line **From:** 가

[3] Mailing List Mail Server Local

[4] Filtering Message  
 Message

# 11 .

## 11.1. [Message Source](#)

## 11.2. [Local Process](#) [Message](#)

### 11.2.1. [Header](#)

### 11.2.2. [\\_\\_\\_\\_\\_](#)

### 11.2.3. [Local Sender](#)

## 11.3. [Remote Host](#)

### 11.3.1. [Host](#)

### 11.3.2. [ehlo](#) [helo](#)

### 11.3.3. [DNS Blocking List](#)

#### 11.3.3.1. [RBL](#)

#### 11.3.3.2. [RBL Warning](#)

#### 11.3.3.3. [RBL Reject](#)

#### 11.3.3.4. [RBL Data](#)



- 11.3.3.5. [RBL Option](#)
- 11.3.4. [Host Block](#)
- 11.4. [Remote Sender](#)
  - 11.4.1. [SMTP Sender](#)
    - 11.4.1.1. [Verify Callback](#)
    - 11.4.1.2. [Verification Router Director](#)
  - 11.4.2. [Sender](#)
  - 11.4.3. [Temporary Sender](#)
  - 11.4.4. [Sender](#)
  - 11.4.5. [Envelope Sender](#)
  - 11.4.6. [Sender](#)
  - 11.4.7. [Header Line Sender](#)
  - 11.4.8. [Sender](#)
- 11.5. [\\_\\_\\_\\_\\_](#)
  - 11.5.1. [\\_\\_\\_\\_\\_](#)
  - 11.5.2. [\\_\\_\\_\\_\\_](#)
  - 11.5.3. [\\_\\_\\_\\_\\_](#)
  - 11.5.4. [\\_\\_\\_\\_\\_](#)
- 11.6. [Header Line](#)
- 11.7. [Relay](#)
  - 11.7.1. [Incoming Outgoing Relay](#)
  - 11.7.2. [Relay](#)
    - 11.7.2.1. [% @ Local Part](#)
    - 11.7.2.2. [Domain](#)
  - 11.7.3. [Incoming Relaying](#)
    - 11.7.3.1. [MX Backup Host \(Secondary Mail Server\)](#)
      - 11.7.3.1.1. [Main Section](#)
      - 11.7.3.1.2. [Router Section](#)
      - 11.7.3.1.3. [Route List](#)
    - 11.7.3.2. [MX backup Relaying](#)
  - 11.7.4. [Outgoing Relaying](#)
    - 11.7.4.1. [Host Relaying](#)
    - 11.7.4.2. [Relay](#)
    - 11.7.4.3. [Sender Relaying](#)
    - 11.7.4.4. [Host Sender Relaying](#)
  - 11.7.5. [Relay Option](#)
- 11.8. [Error Message](#)

Internet , MTA Host Message , Message  
 Message . **Relaying** . 가

Relaying Message Host Open Relay ; Host 가  
 가 . Internet , Mail Relay

Host Relay 가 Relay . ,  
 Domain Host Relay .

Mail 가 Relaying , Incoming Message MTA  
 . Junk Mail Sender Header Line  
 ; Mail Message . Spammer  
 , . 가

Exim Main Section Option Message .  
 Mail Server Relaying . Administrator 가

, Exim Incoming Message

### 11.1. Message Source

TCP/IP Message Local Process Message .  
 . Local Process Local Host TCP/IP  
 Message Remote Host Message . ,

Local Process 가 TCP/IP Message , Loopback  
 . , Loopback Message Relaying ,

SMTP TCP/IP Message . Message 가 TCP/IP  
 Local Process , Pipe SMTP Format .  
 SMTP 가 , Message Local User Process .  
 TCP/IP "remote" .

MTA , Exim Message . , encoding  
 . "8-bit clean" , CR(Carriage return) LF(Linefeed) ,  
 Character . character data .

## 11.2. Local Process Message

Local Process Message TCP/IP Message

Exim , 가 Mail

MUA Message , Cron

Cron Mail

Message Process /usr/sbin/sendmail

/usr/lib/sendmail MTA Exim

Process Exim Sendmail Option 가

Exim Shell Option 가 Message

Header Line Message

Testing

### 11.2.1. Header

Message (Unqualified address)가 Header Line

Message **qualify\_domain(Sender ) qualify\_recipient(recipient )**

Domain , test.example.com Host ,

가

```
qualify_domain = example.com
qualify_recipient = test.example.com
```

Incoming Message 가 Header Line ;

```
From: theboss
To: thedogsbody
```

Exim Header Line

```
From: theboss@example.com
To: thedogsbody@test.example.com
```

### 11.2.2.

Local Process Exim Recipient Envelope 가

, Unqualified ; **qualify\_recipient** Option Domain

Qualified . **Qualify\_domain** **qualify\_recipient**

- **-bs, -bS** -t Option , RFC 822 가 , Exim shell , RFC 822 Header Line Message

```
exim user1@example.com,user2@another.example.com user3
```

- Message , -oi Option dot(.)
- -t Option 가 . Exim Message **To:, Cc:, Bcc:** Header Line 가 envelope recipient **Bcc:** Header Line Message **Bcc:**가 Message **Bcc:**가
- t Option , 가 Header Line , recipient , sendmail . Sendmail
- t Option 가 Recipient 가 . Exim

```
extract_addresses_remove_arguments = false
```

- **-bs** Option , Exim SMTP
- **-bS** Option , Exim SMTP **batch SMTP** , envelope encoding .

SMTP Message , , Message

### 11-1. Recipient Source

Option	
None	가
-t	Header 가 ( Bcc: )
-bs	Local SMTP RCPT 가
-bS	batch SMTP RCPT 가

### 11.2.3. Local Sender

(TCP/IP 가 ) Message envelope sender Message 가  
**trusted** . **trusted** Message 가 SMTP  
 , MAIL Sender .  
**-f** Option Sender .

```
exim -f '<pcharley@example.net>'
```

**-f** Option , Message **From:** Line .

Exim 가 **trusted** 가 , Sender . ,  
 Exim Exim Process ID envelope sender . Domain  
**qualify\_domain** Option .  
**trusted** Exim Main Section .

### 11.3. Remote Host

, Remote Host 가 Message Exim , Remote Host  
 가 . Message .

#### 11.3.1. Host

TCP/IP Message , Remote Host IP . Host **HELO**  
**EHLO** Exim . Exim Host  
 . SMTP Mail Workstation .  
**HELO** **EHLO** Exim **\$sender\_helo\_name** .

Host IP 가 . Local Host /etc/hosts  
 , DNS lookup . 가 . ,  
 DNS lookup . , Internet Host DNS  
 가 . Host 가 IP ,  
 .  
 , Exim Remote Host , Host  
 . DNS Lookup .  
 Exim Host .

host\_lookup = \*

Exim Incoming Host Mail Server  
Local Network 가

host\_lookup = 192.168.1.0/24

IP DNS lookup Host Exim \$sender\_host\_name Host  
, Lookup , Host 가  
, Host Option 가 Exim  
log , HELO EHLO Data

Client Host HELO EHLO

Message Site Local Domain host.example.com Host 가 example.com  
Domain Host 가 broken.exapmle.com Host  
Host

ehlo host.example.com

ehlo example.com

log Administrator 가 Exim

hosts\_lookup Host

11.3.2. ehlo helo

RFC Mail Mail HELO EHLO Data  
, Exim helo\_verify Option

가 Option 가 Host List

Message Host 가 helo\_verify Option , Incoming SMTP Mail

HELO EHLO Mail Error Code

, HELO EHLO <> IP 가 ,

Message Host IP Domain , Message Host IP

, Host Lookup 가 , HELO EHLO

IP Message Host IP ,

HELO EHLO Error Code , Main, reject Log

helo\_verify 가 , Exim Error HELO EHLO

가 Domain Error , Exim

```
helo_strict_syntax = true
```

Option	.	HELO	EHLO	Junk Data	Host
가	.	Host	helo_accept_junk_hosts	Option	.

```
helo_accept_junk_hosts = 192.168.1.0/24
```

### 11.3.3. DNS Blocking List

Internet	Service	,	Service	Remote
Host	List	가	List	DNS
IP	Index	.	List	<b>Realtime Blackhole List(RBL)</b>
<b>RBL</b>			Host	<b>BlackList</b>
<a href="http://mail-abuse.org/rbl/">http://mail-abuse.org/rbl/</a>	site	.	List	<b>Dial-up User List</b> 가
<a href="http://mail-abuse.org/dul/">http://mail-abuse.org/dul/</a>	List	ISP	Dial-up	IP
Administrator	List	Host	SMTP	MTA
List	Open relay		;	.

#### 11.3.3.1. RBL

Exim	Online List	.	List	가	Host
가	Host	Message	Header Line	가	Mail Server
<b>RBL Process</b>	<b>rb_l_host</b>	Host	.	Local Network	Host
Host	<b>RBL</b>		.		System

```
rb_l_hosts = ! 192.168.1.0/24
```

192.168.1.0/24	Network	가	Host	<b>RBL Process</b>	.
<b>rb_l_hosts</b>	가	Host	setting	.	<b>rb_l_domains</b> 가
Lookup	.	List	Lookup	Incoming IP	DNS domains

```
rb_l_domains = blackholes.mail-abuse.org:dialups.mail-abuse.org
```

, 192.168.10.125	IP	SMTP Call	,	2	Domain	DNS Lookup
------------------	----	-----------	---	---	--------	------------

```
125.10.168.192.blackholes.mail-abuse.org
125.10.168.192.dialups.mail-abuse.org
```

**rbl\_domains** Item Match 가 /warn /reject

```
rbl_domains = blackholes.mail-abuse.org/warn : dialups.mail-abuse.org/reject
```

**/warn** Item Match 가 , Item **/reject**  
Item Match 가 , Exim **rbl\_domains** . **/warn** **/reject** Option  
Domain **rbl\_reject\_recipients** , Option ( )  
**rbl\_domains** Item **/reject** Option 가 .

### 11.3.3.2. RBL Warning

RBL warning Main reject Log Log **rbl\_warn\_header** 가 ( ) ,  
Header **X-RBL-Warning:** Message 가 가 System Filter  
Host 가 RBL List , **X-RBL-Warning:** 가 가 .

### 11.3.3.3. RBL Reject

Rejecting **RCPT** Error Message , Message Sender 가  
**recipients\_reject\_except\_sender** List , 가 **recipients\_reject\_except** List

```
recipients_reject_except = postmaster@your.domain
```

Mail , Blacklist Host postmaster Mail  
Mail , **X-RBL-Warning:** Header 가 .

Message 가 Reject , DNS TXT record 가 RBL list Host ,  
**prohibition\_message** Option DNS TXT 550 Reject Message .

### 11.3.3.4. RBL Data

Host Listing IP Domain DNS Address Record  
RBL **127.0.0.1** Record .

```
17.23.168.192.blackholes.mail-abuse.org. A 127.0.0.1
```

Record 192.168.23.17 IP 가 RBL List ; 127.0.0.1  
List Entry



Network Block 127.0.0.2 , entry 127.0.0.3 ,  
 Open relay 127.0.0.4 .  
 record , **rbl\_domains** Domain equal comma IP  
 List . DNS record 가 , .

```
rbl_domains = relays.orbs.org=127.0.0.2/reject
```

127.0.0.2 **ORBS** entry .

### 11.3.3.5. RBL Option

**rbl\_domains** Option 가 가 .

/accept

item Host , **rbl\_domains** item .  
 entry 가 가 Header **blacklist** IP  
 가 Host List DNS Domain **white**  
**list** .

/skiprelay

Host 가 **host\_accept\_relay** Option , Host rbl .  
 , Exim Host Relaying , RBL .

### 11.3.4. Host Block

Host Incomming Mail 가 Option : **host\_reject, host\_reject\_recipientns**.  
 Option 가 . **host\_reject** Host , Host 가  
 SMTP error code . **host\_reject\_recipientns** Host , **recipients\_reject\_except**  
 Mail , **RCPT** Host .  
**host\_reject** 가 , Message Remote Host , **MX host** ,  
 , **host\_reject\_recipientns** . Remote Host  
 가 , Message 가 Bounce 가  
 . , **host\_reject\_recipientns** **host\_reject\_except** .

Option Host List Item .

```
host_reject_recipients = ! xx.yy.zz : *.yy.zz : !*.zz
```

, yy.zz Domain Host zz Domain Host Mail .  
 xx.yy.zz Domain 가 . Exim host list .  
 Host 가 xx.yy.zz , Item , Item Host . yy.zz domain  
 Host Item , Item Host . zz Domain  
 Host Item . Item : \* Item , zz  
 Domain Host .  
 Host , Host List wildcard IP 가 .  
 , 가 . , Host List IP ,  
 . IP DNS . , Item(Host )  
 Host IP .

#### 11.4. Remote Sender

Message envelope Sender Bounce Message 가 . Host 가 Sender  
 Message , Message , Postmaster 가  
 , Bounce Message . Host ,  
**ignore\_errmsg\_errors** Option Message

Sender .

Sender 가

- Mail Software . Workstation MUA ,  
 , 가 , Workstation
- DNS Domain
- Name Server ; Hostmaster , Zone file 가 .
- SMTP Envelope Sender Mail System Gateway.
- Spam Mail ,

##### 11.4.1. SMTP Sender

Exim Sender . Host , Sender  
 SMTP Postmaster 가 Sender 가 .  
 Bounce Message . Host .  
 Exim Host Option .

sender\_verify

Mail , Sender (Verification) ?  
 Bounce Message 가 Sender Exim  
 Message , director router

Local Local-part Remote Domain  
 router director 가

#### 11.4.1.1. Verify Callback

Sender Site , Exim Routing Remote  
 Domain Query Host SMTP  
 Bounce Message Sender Test Exim  
 Sender

```
HELO the local hostname
MAIL FROM:<>
RCPT TO:<the address to be tested>
QUIT
```

RCPT 2xx Code , 5xx  
 Exim Host , Temporary Error Code  
 verification callback Message Host 가 sender\_verify\_hosts\_callback  
 ( sender\_verify\_hosts Option ) , Sender Domain  
 sender\_verify\_callback\_domains Option  
 Timeout sender\_verify\_callback\_timeout Option  
 30

Callback Host  
 Message Host Overhead Callback  
 가 가 Spam Mail , Domain Local-part 가  
 Sender

```
sender_verify_hosts_callback = *
sender_verify_callback_domains = *
```

Callback , Incoming Message Gateway 가  
 Host Gateway Callback ,

```
sender_verify_hosts_callback = *
sender_verify_callback_domains = *.pcharley.net
```

Network Host 가 \*.pcharley.net Domain Callback  
Host SMTP

#### 11.4.1.2. Verification

Router Director

Option , Director router Message  
.forward file , Local . Router Director  
가 , Option  
가 .

, no\_verify 가 , Driver . .forward file Director  
no\_verify . sender recipient

```
no_verify_sender
no_verify_recipient
```

no\_verify Option . no\_verify Option verify\_only  
Option Driver  
Option fail\_verify 가 . Option 가 Driver 가 ,  
. , Option Driver  
가 .

#### 11.4.2. Sender

sender\_verify\_hosts Option Host 가 . , Message  
Host Cluster 가 Host Message Sender Mail System  
, Option Cluster Host Message Sender Mail  
가 .

```
sender_verify_hosts = ! *.cluster.host
```

#### 11.4.3. Temporary Sender

Sender 가 DNS , Exim Message  
Data 가 Temporary Error(code 451) . Error MAIL  
Message Data 가 , Message Header Line log  
sender\_try\_verify 가 , Sender Temporary Message

Exim Temporary Sender Error Hints Database . 24 Host  
 Temporary Error 가 Data 가 Error , MAIL Error Code 451  
 . reject log Data Network Data .  
**sender\_verify\_max\_retry\_rate** Option 0 , Host Incoming  
 Sender Temporary Option ,  
 Temporary Error Error . Host Sender Temporary 가  
 .  
 Option 12 . 5 Temporary Error 가 Sender  
 . , Temporary  
 24 Error 가 . 24 hint .

#### 11.4.4. Sender

Error **sender\_verify\_reject** .  
 Option ( ) Message .

`no_sender_verify_reject`

Option , Message Log , 가 .  
 Remote Postmaster 가 Message Header , Exim Sender 가  
 Error . , Message Data , Data 가  
 Error Code(550) . Message Header Reject  
 Log . 3 Envelope Recipient Header Log .  
 , Data 가 SMTP Error Temporary Failure  
 Software 가 . RFC 821 5 Code "Permanent negative completion"  
 . , RFC  
 . Software Data Code Message  
 .  
 , Exim Message , Sender Host Database .  
 24 Host 가 Sender Message , Exim Message Recipient  
 Data MAIL Message . Message , Message  
 Host 가 . MAIL Message  
 Software 가 .  
 Program , Host 가 24 Sender 3  
 , MAIL RCP 550 Error .  
 Message Software 가 Hard Error , Software .

Remote Message 가 . Exim 550 Error , 가 Local

550 unknown local part in sender  
550 cannot route to sender

MTA Message 550 Error 가 .

550 Unknown user

, Remote Exim Remote 가 .

**Three-stage** Exim .  
Release 가 (RCPT )

#### 11.4.5. Envelope Sender

Sender 가 , Message Header Line 가 .  
Mail Gateway Internet Message . Exim  
, Sender Header Line .

**sender\_verify\_fixup sender\_verify** , sender 가 , Header Line  
**Sender:, REply-To:, From:** 가 Message . ,  
Envelope Sender , Header Line .

X-BadReturnPath: **abc@bad.example** rewritten  
as **xyz@good.example** using From header

Header 가 , **Resent- Header** 가

Sender Error Temporary Error . 가  
Name Server DNS Zone . ,

**sender\_verify\_fixup** , **sender\_verify\_reject** 가 , Exim Message  
, Log .

#### 11.4.6. Sender

**-bvs** Option Sender .

exim -bvs pcharley@test.sender.domain

Director Router **sender\_verify** Option , Sender Recipient ,  
-bvs -bv 가 .

Director Router **\$sender\_host\_adress** , Sending Host Test  
 , -oM Option Test 가 .

11.4.7. Header Line Sender

Exim Sender Option Envelope Sender 가 Message Block .  
Bounce Message Envelop Sender 가 . Bounce Message  
 , Sender 가 .

MAIL FROM:<>

Site Sender 가 Message Site Bounce  
Message Block Site

, Exim Envelope Sender Sender ; Sender  
 Sender Message  
 가 , **headers\_sender\_verify\_errmsg** Option Envelope

Sender 가 Message [\[1\]](#) , Exim Envelope Sender Header Line .  
Header **Sender:, REply-To:, From:** Line ,  
 , Message **headers\_checks\_fail** Reject Log  
Message .

Header 가 , **Resent-:** Header 가 ,

, Exim Message , Data ,  
 Client Program Error ; Client  
Program Spool Message Exim  
 , Client Program .

**headers\_sender\_verify** Option Sender 가 Message , Incoming  
SMTP Message Header **Sender:, REply-To:, From:** .

**sender\_verify\_hosts** Option **sender\_verify** Header Option . Option  
Host .

11.4.8. Sender

가 Spam Envelope Sender MailBox 가 System  
 , Envelope Sender 가 Spam Mail , Spam Mail  
 Envelope Sender 가 Envelope Sender Message  
 Block Sender Block  
 Sender Block Option 가 가 . **sender\_reject**

**sender\_reject\_recipients**

```
sender_reject = spamuser@some.spam.domain:some2.spam.domain
sender_reject = partial-dbm;/etc/exim/block/senders
```

Option 가 . Sender 가 **sender\_reject** , MAIL  
 Error , MAIL Error 가 Remote Host  
 가 . MAIL **sender\_reject**  
**sender\_reject\_recipients** Option RCPT ,  
**recipients\_reject\_except** List Recipient . Option **sender\_reject\_recipients**  
 Option

[\[1\]](#) Bounce Message

11.5.

SMTP Message Incoming , 가 . MTA 가  
 가 , RCPT  
 RCPT , Exim RCPT Relaying  
 가 SMTP , Message 가

- 가 ( , Database 가 ), SMTP 가 SMTP  
 가
- Local Domain 가 가 , 가 가 Message  
 Postmaster



가 : 가 , Sender [\[1\]](#)  
 , Bounce Message System Postmaster  
**Frozen** System Message 가 가 .  
 가 Mail Mailing List  
 Mailing List Bounce Message 가 Sender 가  
 가 Spam Mail Domain Local-part Mail .  
 Callback Sender Sender 가 .

### 11.5.1.

, Exim SMTP . , Option  
 RCPT .

```
receiver_verify
```

Mode Director Router 가 Sender .  
 가 , RCPT

```
550 Unknown local part pcharley in <pcharley@microsoft.com>
```

Database down Temporary Error Code 가 .  
 Option , Log .

```
receiver_try_verify
```

### 11.5.2.

가 ,  
**receiver\_verify\_hosts** Option Host , Host .  
 가

```
receiver_verify_hosts = ! *.cluster.domain
```

, cluster.domain Host 가 .

, **receiver\_verify\_addresses** Option .  
 Domain Domain . ,  
 Remote Domain Relay Server Host Domain  
 가 . [\[2\]](#) Local Domain .

```
receiver_verify_addresses = localdomain.example
```

**receiver\_verify\_senders** , Sender 가 List Message  
 Bounce , Domain RCPT Time Message Mechanism

```
receiver_verify_sender = ! *.mycompany.example
```

. Message Sender 가 Domain , SMTP  
 Time .

### 11.5.3.

**-bv** Option Exim Test .

```
exim -bv badguy@bad.domain
```

Director Router **receiver\_verify** Option , Sender Recipient  
**-bvs -bv** 가 .

Director Router **\$sender\_host\_address** , Sending Host Test  
 , **-oM** Option Test 가 .

### 11.5.4.

Message Option . ,  
 가 , Router Director  
 . , Local **root** Mail , **root** Mail  
 가 . local-part **root** Director 가 .  
 , 가 Director .

```
no_verify_root
  driver = smartuser
  local_parts = root
  verify_only
  verify_recipient
  fail_verify
```

**verify\_only** **verify\_recipient** Option , Director 가  
 . **local\_parts** Option Local-part . Director Smartuser  
 . **fail\_verify** Option . **root** Mail  
 Message ,  
**root** Mail .

[1]

[2] MX Backup Host , Host  
Outgoing Relay .

### 11.6. Header Line

Header Line 가 Message Internet .  
Software Line .

```
To: user@domain <user@domain>
To: <mailto:user@domain>
```

Spam Mail .

```
To: @
To: <>
```

**headers\_check\_syntax** Option Incoming Message(Local Remote ) Header  
List(Sender:, From:, Reply-To:, To:, Cc:, Bcc:) . Option  
Header 가 Message .  
**no\_header\_checks\_fail** Option Reject Log Message .  
**headers\_check\_syntax** 가 SMTP Message Data 가 , Non-SMPT Message  
Message Error 0 .

### 11.7. Relay

Exim Message Relay 가 Host  
Mail Host (FQDN) Local Domain , Mail Service 가  
Incoming Message 가  
; Host Message aliases **.forward file** .  
**Redirection** Relay 가  
Relay Host Message 가 Local Domain 3 Host  
Message 가 **alpha.example beta.example homer@beta.example**  
가 , Relay beta Host homer 가 **.forward file**  
가 Message Host Relay .

가 Local Domain . 가 **odysseus@gamma.example** , beta Host  
Relay .

alpha -> beta -> gamma

Message 가 ; Relay ,  
. Relay 가 .

### 11.7.1. Incoming Outgoing Relay

Exim , Message Relay 가 가 .

Gateway MX backup Host Host Message Domain Relay .

**Incoming Relaying** . Client **Smarthost** Host

Client Internet Message Relay . **Outgoing Relaying** . Remote Host

System Domain Message .

Host Incoming Outgoing Relay . Relay

Option , . Mail Server , Incoming

Outgoing Relay Host 가 .

### 11.7.2. Relay

Relay Host Message Domain  
. **-bm, -bs, -bS** Exim Mail Relay  
. **inetd -bs** Option Exim Relay 가 . Relay SMTP  
RCPT . 가 가 Relaying 가 ;

Domain **local\_domains** , Local Host 가 ,

Relaying , .

#### 11.7.2.1. % @ Local Part

z 가 Local Domain , **"x@y"@z** Relaying . Exim

Local Part x@y 가 ; Local Domain z x@y

. x@y 가 Local Part 가 , Reject .

**percent hack percent\_hack\_domains** Option , **"x%y"@z**

. **percent hack** , Local Part % @ .

Incoming , Domain Relaying .

#### 11.7.2.2. Domain

Exim RCPT Time FQDN Domain Incoming Message 가 FQDN  
 , Domain local\_domains relay\_domains [\[1\]](#) Nonlocal, Nonrelay  
 Domain FQDN Domain , MTA 가 MUA  
 Smart Host , Domain Relay  
 MUA Host , 가 .

### 11.7.3. Incoming Relaying

Incoming Relaying Host 가 Local Host Message Domain **relay\_domains**  
 Option , **force.example** **hyunduck.example**  
**pcharley.example** MX backup , force.example .

```
relay_domains = hyunduck.example : pcharley.example
```

, MX Backup Host .  
 , pcharley Host Mail 가 가 ,  
 Exim ,

```
local_domains = pcharley.example.com  

relay_domains = *.pcharley.example.com
```

Host Mail pcharley.example.com pcharley.exmaple.com  
 Sub Domain Mail reject .

SMTP , Incoming 가 Local Domain 가 , **relay\_domains** Option  
 , ; , Section Outgoing  
 relaying .

#### 11.7.3.1. MX Backup Host (Secondary Mail Server)

1 Mail Server Mail Service 가 Message  
 , Mail Service 가 ,  
 Service , Mail Service

MTA Bind 가 MX Backup Server [\[2\]](#) 가 .  
 Exim Incoming Relay MX Backup Server . MX Backup Server  
 Main Server 가 Down 가 Message Remote Host  
 , Down Message MX Backup Server .  
 Main Server 가 가 MX Backup Server Message MX Backup Server Retry Rule

Administrator [\[3\]](#) Main Server . MX Backup Server Mail Gateway SmartHost .

가 , Mail Service Main Domain example.com 가 , Main Mail Server MX Backup Server 가 1,2 Mail Server DNS MX Record 가 .

### 11.7.3.1.1. Main Section

Exim Main Section 가 .

```
relay_domains = example.com
```

### 11.7.3.1.2. Router Section

Main Section relay\_domains , Router Driver . Router mx\_backup Driver 가 .

```
mx_backup:
  driver = domainlist
  transport = remote_smtp
  route_list = example.com mail.example.com byname
```

route\_list Option Routing Rule List . (:) Host List , route\_list Host List (:)

route\_list Routing Rules Route Option [\[4\]](#) . route\_list Routing Rule , Routing Rule Routing Rule (:) . Rule , Rule .

```
<domain pattern> <host list> <option>
```

Domain Rule .

```
route_list = pcharley.com hot01.pcharley.com:host02.pcharley.com byname
```

Rule , route\_list Rule Rule Item , Domain . Domain Domain List [\[5\]](#) Item , Wildcard, Database Lookup . route\_list Rule 가 Route Domain , .

route\_list Rule Domain , Domain search\_type Type Key , route\_file, route\_query route\_queries Key .

Route File      Data      Host List      Option

pchar le.com:      host01.pchar ley.com:host02.pchar ley.com      byname

(:) 가      Key

Host List      Host List      Option      Rule

가      Data

Domain      route\_list      , route\_file, route\_query      route\_queries      Domain

, Router Driver      , no\_more Option

Router Driver

Option      Host List 가      Option      Word

. Word      transport      가      Routing Rule      Router

Driver      Transport Option      Word      Host List      Host      IP

### byname

**gethostbyname()**      ,      Literal IP Address      . Literal IP Address      square  
bracket([])

### bydns

DNS      Host      MX      A Record

### bydns\_a

DNS      Host      A Record      . A Record 가

### bydns\_mx

DNS      Host      MX Record      . MX Record 가

qualify\_single      search\_parents Option      DNS      . Host      IP  
, host\_find\_failed Option      Exim

### 11.7.3.1.3. Route List

remote\_smtp transport 가      가

- Host 가 Gateway , Message Pipe File 가 ,  
Domain , Route List Entry Domain  
Name :

```
route_append:
  driver = domainlist
  transport = batchsmtp_appendfile
  route_list = gated.domain
```

- Domain Transport Domain Domain Group ,  
Transport Routing List .

```
route_append:
  driver = domainlist
  route_list = \
    *.gated.domain1 $domain batch_appendfile; \
    *.gated.domain2 \
      ${lookup{$domain}dbm{/domain2/hosts}{$value}fail} \
      batch_pipe
```

- route\_list Routing Rule \$host Domain . Routing  
Rule Domain Router .

- Mail Hub Domain Mail , Routing Mechanism  
Mail . Mail Hub  
가 Host Mail Hub [6] 가 .

Domain List Router .

```
through_firewall:
  driver = domainlist
  transport = remote_smtp
  route_file = /internal/host/routes
  search_type = lsearch
```

- Routing Rule 가 , Routing Rule route\_list Option  
Routing Rule 가 Rule  
Routing Rule .

```
pcharley.example: mail-1.pcharley.example:mail-2.pcharley.example byname
```

- pcharley.example Mail Hub 가 MX Record 가 DNS ,  
pcharley.example Mail Routing Rule Machine Forward  
136



Machine **gethostbyname()** Domain Mail Hub  
 Routing Machine ,

```
hub_route:
  driver = domainlist
  transport = remote_smtp
  route_list = *.pcharley.example $domain byname
```

- \*.pcharley.example Domain gethostbyname() route  
 Mail Hub Routing Machine Routing Rule Domain  
 Host Domain ,
- Mail SmartHost Forward Domainlist Router

```
smart_route:
  driver = domainlist
  transport = remote_smtp
  route_list = * smarthost.example bydns_a
```

- Message smarthost.example Host . smarthost.example  
 DNS A Record . (: Smarthost List 가 ,  
 Domain Route , SmartHost Router Section
- Domainlist Router verify\_only  
 fail\_verify . Transport Host 가 .

### 11.7.3.2. MX backup Relaying

Domain Host 가 Mx Backup , DNS MX Record ,  
 Exim Domain List .  
**relay\_domains\_include\_local\_mx** 가 Option . Option , relay\_domains  
 Option Domain , Domain MX Record 가 MX backup Host  
 가 Domains Relaying .

: **relay\_domains\_include\_local\_mx** Option , DNS Zone 가가  
 Domain Backup Secondary MX Record Server List

- Hostmaster
- 가 Mail

Source , Data Set 가  
 DNS Zone Data Exim Relaying Data

#### 11.7.4. Outgoing Relaying

가 Local Domain Incoming Relay Domain , Outgoing Relay 가  
 Host Domain Relay 가 Host  
**host\_accept\_relay** Option , pcharley IP 192.168.1.0/24  
 Host 가 Outgoing Mail ,

```
host_accept_relay = 192.168.1.0/24
```

Host Outgoing Relay Host Outgoing Relay  
 Exim loopback IP Relay Default , loopback Mail  
 Local Host Process Relaying , Relay List 127.0.0.1 [\[7\]](#)

```
hosts_accept_relay = 127.0.0.1 : 192.168.1.0/24
```

##### 11.7.4.1. Host Relaying

**host\_auth\_accept\_relay** Option Client Host Relay 가  
**host\_accept\_relay** Option **auth\_hosts** Option

##### 11.7.4.2. Relay

Exim SMTP encryption Compile , **tls\_host\_accept\_relay** Option  
 Relaying SMTP Session **host\_accept\_relay**

##### 11.7.4.3. Sender Relaying

Exim Host , Outgoing Relaying Message Envelope Sender  
 . **sender\_address\_relay** 가 Host 가 **sender\_address\_relay\_hosts** Option [\[8\]](#)  
 , MAIL Sender Exim Domain Outgoing Relaying  
**sender\_address\_relay** , Client Internet Mail Relaying  
 Mail Hub Relaying Message Sender 가 Domain

```
host_accept_relay = 192.168.1.0/24
sender_address_relay = *@pcharley.net
```

Client 가 Incoming Mail MTA , Host Bounce  
 Message sender\_address\_relay Option Relaying  
 Sender .

```
sender_address_relay = : *@pcharley.net
```

#### 11.7.4.4. Host Sender Relaying

, Host Sender Outgoing Relay 가 ,  
 relay\_match\_host\_or\_sender Option , Host Sender  
 Outgoing Relaying , Sender Option  
 Roaming Client  
 , SMTP

#### 11.7.5. Relay Option

Relay Option  
 Option TCP/IP Message

**host\_accept\_relay** (host list, = unset)

Relay 가 Host .

**host\_auth\_accept\_relay** (host list, = unset)

Relay 가 Host , host .

**relay\_domains** (domain list, = unset)

Incoming Relay Domain . Domain Mail Host

**relay\_domains\_include\_local\_mx** (Boolean, = false)

Domain MX Record 가 Local Host , Domain Relay Host  
 MX Record 가 Local Host 가 Domain **relay\_domain** Option

**relay\_match\_host\_or\_sender** (Boolean, = false)

Outgoing Relay 가 Host Sender , ( Host Sender  
 ) 가 Message . relay\_match\_host\_or\_sender 가

, 가 Message . Option

**sender\_address\_relay** (address list, = unset)

Relay Message Sender . Option  
Sender 가 .

**sender\_address\_relay\_hosts** (host list, = \*)

sender\_address\_relay Message Host 가 Option List Item

[1] local\_domains, relay\_domains , .

[2] Queueing Server Secondary Server .

[3] exim -qff

[4] route\_file, route\_query Route\_queries

[5] Domain List [Online](#) .

[6] .

[7] IPv6 Host ::1

[8] \*

### 11.8. Error Message

Site Mail Incoming SMTP , Error Message 가  
; , Mail Host 가 Host Reject List , Relaying .  
Message **prohibition\_message** Option , Error Code 가  
Line Line Multiline Marker .

prohibition\_message = contact admin@pcharley.net for details

Relay , RCPT .

550-contact admin@pcharley.net for details

550 relaying to <bad@bad.net> prohibited by administrator

File

가

, \$prohibition\_reason

\$prohibition\_reason

가

### 11-2. Prohibition Reasons

Value	Meaning
host_accept_relay	Host 가 accept_relay List
host_reject	Host 가 Reject List
host_reject_recipients	Host 가 reject_recipients List
rbl_reject	Host 가 RBL Domain reject
receiver_verify	Receiver Verification( )
sender_relay	Message Sender 가 Sender Relay List
sender_reject	Message Sender 가 Reject List
sender_reject_recipients	Message Sender 가 reject_recipients List
sender_verify	Sender Verification

```
prohibition_message = \
    ${lookup{$prohibition_reason}|search{/etc/exim/reject.message}{$value}}
```

```
/etc/exim/reject.message
```

```
host_accept_relay: host not in relay list
```

```
relay          Reject
```

```
550-host not in relay list
```

```
550 relaying to <bad@bad.com> prohibited by administrator
```

```
Message      Message      !search lookup      Text
Newline      가      , Exim  Text      Line      .      Text
(reexpand)      , expand Operator      가      .
```

```
prohibition_message = \
    ${lookup{$prohibition_reason}|search\
    {/etc/exim/reject.message}${expand:$value}}
```

/etc/exim/reject.message 가

```
host_accept_relay: Host $sender_fullhost is not permitted to
                    relay |through $primary_hostname.
```

Message

```
550-Host example.pcharley.net [192.168.1.10] is not permitted to relay
550-through that.host.name.
550 relaying to <badguy@bad.com> prohibited by administrator
```

```
realtime blackhole list(RBL) , $rbl_domain 가 RBL Domain
. RBL Domain TXT Record , TXT Record 가 , $rbl_text
.
```

12 . ,

12.1. [SMTP](#)

- 12.1.1. [Mechanism](#)
- 12.1.2. [PLAIN](#)
- 12.1.3. [LOGIN](#)
- 12.1.4. [CRAM-MD5](#)
- 12.1.5. [Mechanism](#)
- 12.1.6. [Exim](#)
- 12.1.7. [Exim Server](#)
- 12.1.8. [\\_\\_\\_\\_\\_](#)
- 12.1.9. [Server Test](#)
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- 12.1.11. [Exim Client](#)
- 12.1.12. [Option](#)
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- 12.1.14. [Client Plaintext](#)
- 12.1.15. [Server CRAM\\_MD5 Mechanism](#)
- 12.1.16. [Client CRAM\\_MD5](#)

12.2. [SMTP](#)

- 12.2.1. [TLS \(Exim Server\)](#)
- 12.2.2. [TLS](#)
- 12.2.3. [TLS Client](#)
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12.3. [TCP/IP SMTP](#)

- 12.3.1. [TCP/IP Outgoing SMTP](#)
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12.4. [PAM](#)

- 12.4.1. [\\_\\_\\_\\_\\_](#)
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- 12.4.3. [PAM](#)
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Exim

Exim

:

PAM

: Exim OS System PAM  
 System OS , PAM root ,  
 Process 가 , Exim Exim user(Debian  
 mail Exim .) , A 가 PAM Exim  
 PAM System A Exim Exim 가

## 12.1. SMTP

, Netowrk, Host SMTP Protocol  
 Host , Host 가 Mail 가  
 Internet . Server Client Mail  
 Relaying Host Mail Client Relay  
 Relaying Message Host , Local  
 Network Client Relaying

```
host_accept_relay = 192.168.3.0/24
```

- 가
- Laptop Mail Server Mail  
 Game-room( ) Client Mail
- IP IP host\_accept\_relay  
 Option 가
- Local Network ; Mail Server Mail

SMTP (RFC 2554)

SMTP

- Server 가 EHLO , Mechanism 가  
 EHLO , Line LOGIN CRAM-MD5  
 Mechanism

```
250-server.auth.com Hello client.auth.com [192.168.1.100]
250-SIZE
250-PIPELINING
250-AUTH LOGIN CRAM-MD5
```



250 HELP

- Client 가 , Client Mechanism SMTP AUTH .

AUTH LOGIN

- 가 Data .
- Server " Data 가 ." , 3 Code challenge( ) "Please enter a password" Prompt 가 .
- Client challenge .
- Server Challenge , Challenge- Data 가 Auth , Challenge Data base-64 encode , 256byte 가 . 가 . 가 decode 가 .
- , Server 가 Code . Temporary Error .

Client 가 , Server Client Server .

### 12.1.1. Mechanism

Mechanism . Exim 3 : MUA PLAIN, LOGIN CRAM-MD5 가 SMTP Code Exim Binary

SMTP Exim , 3 Mechanism 가 .

### 12.1.2. PLAIN

PLAIN RFC 2595 . AUTH Binary Zero 3 Data . user/password . SMTP , 가 Challenge . 가 . C Clinet , S Server 가 .

C: AUTH PLAIN AHBjaGFyYGV5AHBhc3M=

S: 235 Authentication successful

base-64 AHBjaGFybGV5AHBhc3M= encoding .

<nul>pcharley<nul>pass

<nul> Binary-zero byte . Data , pcharley,  
pass .

PLAIN 가 . Client Host Encoding  
Server Encode . Login  
SMTP , Network  
가 Data 가 가 .

### 12.1.3. LOGIN

LOGIN RFC . MUA Pine . PLAIN ,  
user/password , Prompt 가 , Data

```
C: AUTH LOGIN
S: 334 VXNIciBOYW1I
C: cGNoYXJsZXk=
S: 334 UGFzc3dvcmQ=
C: cGFzcw==
S: 235 Authentication successful
```

base-64 encode .

```
C: AUTH LOGIN
S: 334 User Name
C: pcharley
S: 334 Password
C: pass
S: 235 Authentication successful
```

LOGIN 3 PLAIN 가 Packet . PLAIN ,  
LOGIN PLAIN . LOGIN  
PLAIN .

#### 12.1.4. CRAM-MD5

CRAM-MD5 (RFC 2195) Network 가 . Server  
 Challenge , Client ,  
 MD5 Digest Challenge . Server MD5 Digest ,

```
C: AUTH CRAM-MD5
S: 334 PDE40TYuNjk3MTcwOTUyQHBvc3RvZmZpY2UucmVzdG9uLm1jaS5uZXQ+
C: dGltIGRkOTJiNGJiMzRhZmFhNzBmMjkwNWVkdZMxOTZhNTU3
S: 235 Authentication successful
```

```
C: AUTH CRAM-MD5
S: 334 <1896.697170952@postoffice.reston.example>
C: tim dd92b4bb34afaa70f2905edd3196a557
S: 235 Authentication successful
```

dd92b4bb34afaa70f2905edd3196a557 MD5 Digest .

```
<1896.697170952@postoffice.reston.example>secret
```

가 가 . Challenge  
 , Digest .

CRAM-MD5 2 , 가 .  
 Client 가 Server .

#### 12.1.5. Mechanism

Server Exim Client , Server 가 Mechanism  
 , Telnet Mechanism 가 .

```
$ telnet test.server.example 25
Trying 192.168.1.110...
Connected to test.server.example
Escape character is '^]'.
220 test.server.example ESMTP Exim 3.35 #1 Fri, 18 Jul 2003 18:44:01 +0900
EHLO client.domain.example
250-test.server.example Hello pcharley at client.domain.example [192.168.1.80]
```

```

250-SIZE 10485760
250-PIPELINING
250-AUTH PLAIN CRAM-MD5
250 HELP
quit

```

Exim Server , Mechanism ; ,  
Client Software 가 . 가

Mechanism 가 . Network 가 , Data 가  
, Internet 가

, SMTP Login .  
SMTP 가 , Mail 가 .  
Login , SMTP ,

SMTP , CRAM-MD5 Login Server  
; 가 , Mechanism  
가 , Server 가 , PLAIN  
LOGIN Mechanism .

SMTP 가 Exim , **TLS-encrypted** session Client 가  
. AUTH Session Host . Session  
, **auth\_over\_tls\_hosts** Option . Host Session  
Session .

```
auth_over_tls_hosts = *
```

SMTP Session Option 가 .

### 12.1.6. Exim

Exim SMTP Compile , 7 Part .  
Routers, Directors Transports . Exim SMTP Mail ,  
Exim Server , Message Host Client . Option  
, Exim Program Client, Server .  
Server Client Function 가 .

Option Function , **server\_** **clinet\_** 가 Server Client Function  
Option Option , Server Client  
Function 가 . 가 Server Client Function , Option ,  
가 .

cram:

```
driver = cram_md5
public_name = CRAM-MD5
server_secret = ${if eq{$1}{pcharley}{secret}fail}
client_name = pcharley
client_secret = secret
```

**server\_** Option Exim Server , **client\_** Option Exim Client

### 12.1.7. Exim Server

Message 가 Host , **\$received\_protocol** esmtp smtp asmtip , [1]  
**\$sender\_host\_authenticated** Client Driver .

Server SMTP auth Client Host Client Host 가 **auth\_hosts**  
Item , HELO, EHLO, HELP, AUTH, NOOP, RSET, QUIT Server 가  
Client Host .

**host\_auth\_accept\_relay** Item Host **auth\_host** Host 가  
Domain Relay 가 , Host 가 **host\_accept\_relay**

**host\_auth\_accept\_relay** Option Item , Client Host Relay 가 .  
Client Host **host\_accept\_relay** Item Relay 가 .

가 .

- IP Relay 가 **auth\_hosts**  
**host\_accept\_relay** **host\_auth\_accept\_relay** 가 .
- Host Relay 가 .

```
host_auth_accept_relay = *
```

가 가 , Client Host **auth\_hosts** Nonrelay Message

12.1.8.

Exim Server, EHLO, Host, Exim, Host, host\_accept\_relay Option, relay, Host 가 ?, Client, Software Server, Server

```
auth_always_advertise = false
```

Host, auth\_hosts, host\_auth\_accept\_relay, Client, host\_accept\_relay, Host, Server

12.1.9. Server Test

Exim -bh Option, Server, auth, Data, base-64, encode, mimencode [2], System, Data, 가

```
echo -n '\0name\password' | mimencode
```

Shell echo -n, Newline, Text, Shell [3], -n Option, Shell

```
echo '\0name\0password' | mimencode
```

mimencode Perl Script 가

```
#!/usr/bin/perl -w
use MIME::Base64;
printf ("%s", encode_base64(eval "\"$ARGV[0]\""));
```

Script Perl, encode, [4] Perl, Data, Binary Zero, Perl Script, encode, Encode, Data, 가

```
encode '\0user\0password'
```

: , Backslash(\) Shell Single Quote(')

12.1.10. Sender

Client Host 가 , Exim Incoming SMTP Mail Auth .

MAIL FROM:<theboss@acme.com> AUTH badguy@bogus.com

AUTH Message 가 .  
 . <> " Sender " .  
 , Client Host 가 , Exim Auth , .  
 , Auth \$authenticated\_sender  
 , Exim Client Host \$authenticated\_id .  
**\$authenticated\_id** \$authenticated\_id  
 E-mail 가 .

12.1.11. Exim Client

Function Exim Compile , smtp transport **authenticate\_hosts** Option  
 . smtp transport 가 Server , Server 가 **authenticate\_hosts** Item  
 , Client Exim .

- Client . Client , Client Public Name  
 , Server 가 Mechanism .
- , Client Code . **\$host** **\$host\_address** Client 가  
 Server IP .  
 가 .
- Temporary Error 가 , Exim Message .  
 Backup Host 가 , .
- Permanent Error(5xx Code) , Exim List .  
 Permanet Error Mechanism ,  
 Message .

Exim Server , Message 가 Sender 가 , Exim MAIL Auth  
 가 . Local Procesee 가 Message Exim , Sender Login  
 , **qualify\_domain** .

12.1.12. Option

Directors, Routers, Transports 가 . 가  
 3 가 Option 가 .

**driver** (string, = unset)

Option plaintext [5] cram-md5 가

**public\_name** (string, = unset)

Option Driver Mechanism  
, Underscore, Hyphen 가 public\_name  
, Driver Server public\_name EHLO  
, Exim Auth List Auth  
Mechanism Public Name

**server\_set\_id** (string, = unset)

Exim Server 가 Client Data  
\$authenticated\_id Incoming Message Incoming Message Log  
user/passwd  
Message 가

### 12.1.13. Server Plaintext

Server Exim , plaintext Client Data  
\$1, \$2 Data Data server\_prompts [6]

, AUTH , Challenge Prompt  
. Command Line Data List AUTH  
server\_prompt Prompt Data  
. Client List 가 PLAINTEXT  
PLAIN LOGIN Mechanism  
Data , server\_condition temporary error code 가  
가 , 0, no, False , 가 1, yes, True  
, server\_set\_id Option \$authenticated\_id  
, Temporary Error Code Error Text

PLAIN Mechanism(RFC-2529) 3 AUTH  
, user/password user password

fixed\_plain:



```

driver = plaintext
public_name = PLAIN
server_condition = ${if and {{eq{$2}{pcharley}}{eq{$3}{pass}}}{yes}{no}}
server_set_id = $2

```

EHLO

250-AUTH PLAIN

Client Host

AUTH PLAIN AHBjaGFybGV5AHBhc3M=

	RFC	, base 64	Encode	Encode
Decode	<nul>pcharley<nul>pass 가	. <nul>	zero byte	3
			pcharley, pass	Prompt
	AUTH		Data	,
		DB	Password	\$2
	Password	Password		Password
/etc/passwd File	가	,	가	.

```

server_condition = ${if crypteq{$3} \
  ${extract{1}{:}{${lookup{$2}|search{/etc/passwd}{$value}}}} \
  }{yes}{no}}

```

Incoming SMTP Exim , server\_condition  
Exim 가 .

**LOGIN** Mechanism Data AUTH , Prompt  
Password 가 . plaintext

```

fixed_login:
driver = plaintext
public_name = LOGIN
server_prompt = "User Name : Password"
server_condition = \
  ${if and {{eq{$1}{pcharley}}{eq{$2}{pass}}}{yes}{not}}
server_set_id = $1

```

Prompt AUTH Data , Client 가 ,

12.1.14. Client Plaintext

plaintext **client\_send\_string** Client Option 가 , Colon  
 Data List . Server  
 AUTH ; Server Prompt .

PLAIN Mechanism AUTH Data Zero Byte , 가  
 Data (Circumflex) 가 , Zero  
 . Data 가 ,

PLAIN Mechanism Password 가 Client .

```
fixed_plain:
  driver = plaintext
  public_name = PLAIN
  client_send = ^pcharley^pass
```

**client\_send** Colon Zeror Byte text 가 AUTH  
 . LOGIN Mechanism .

```
fixed_login:
  driver = plaintext
  public_name = LOGIN
  client_send = : pcharley : pass
```

Colon AUTH Data 가 , Prompt .

12.1.15. Server CRAM\_MD5 Mechanism

Server Option 가 , Server  
**server\_secret** . Server 가 Client , \$1 ,  
**server\_secret** Password . Server Client 가 CRAM-MD5 Digest  
 , **server\_secret** ,  
 , Temporary Error Code 가 Client .  
 , Client , Client pcharley , Password pass 가 .  
 Key Secret

```
fixed_cram:
    driver = cram_md5
    public_name = CRAM-MD5
    server_secret = ${if eq{$1}{pcharley}{secret}fail}
    server_set_id = $1
```

, server\_set\_id      **\$authenticated\_id**

#### 12.1.16. Client      CRAM\_MD5

Client      , cram\_md5      **client\_name**      **client\_secret**      Option  
 Server      Challenge      ,      Secret

(Forced Failure)      가      가

Exim      Client      Exim      Server      Message

가      , **cram\_md5**

```
fixed_cram:
    driver = cram_md5
    public_name = CRAM-MD5
    client_name = pcharley
    client_secret = pass
```

Client      Mail      Server      ,  
 . Client 가      Server      ,      Option      **\$host**  
**\$host\_address**      Server      Data      가

[1] [10.8.4](#)

[2]      Debian System      mimencode      가      Package

[3]      Solaris Bourne shell

[4]      Script      가

```
perl -MMIME::Base64 -e '{printf ("%s", encode_base64(eval "\"$ARGV[0]\""))}' '\0name\0password'
```

[5] **PLAIN**      **LOGIN**      가

[6] colon      Prompt      List

## 12.2. SMTP

RFC 2487 SMTP Host 가 Data ,  
Client STARTTLS . Server 가 , Server Client Data  
Mechanism . Server , Server SmartHost Client  
. Sender MailBox end-to-end .  
Server Server Message 가 . Exim Code  
, Exim Transport Layer Security(TLS) [1] [OpenSSL](#) Library

Exim , **OpenSSL** , Compile TLS  
Exim Compile . 가 , ,  
, 가 .

[FAQ \[2\]](#)

, 가 Link .

OpenSSL **req** self-signed . [\[3\]](#)

```
openssl req -x509 -newkey rsa:1024 -keyout file1 -out file2 -days 9999 -nodes
```

```
 , -keyout -out  
 ; 가  
, 가 . -days Option ;  
20 . -nodes Option ; Option ,  
Passphrase , Passphrase .  
가 MTA , .  
self-signed certificate Test , , 가
```

### 12.2.1. TLS (Exim Server)

Exim TLS Compile , Exim **tls\_advertise\_hosts** Option Client Host  
STARTTLS . TLS Client  
Option unset [\[4\]](#) . Exim Server 가 TLS , **tls\_advertise\_hosts**  
Option , 가 .

```
tls_advertise_hosts = *
```

```

tls_certificate = /etc/exim/cert
tls_privatekey = /etc/exim/privkey

```

Server X509 가 , 가 .  
 Exim 가 . 가 , Option

2 Option , Exim Netscape Client Server .  
 Client 가 가 . Option .  
**tls\_dhparam** , SSL **Diffie - Hellman**  
 Cipher . Server 가 Cipher 가 .  
 Option Client Host 가 . ,  
 Client **\$sender\_host\_address** Client IP ,  
 Host . , Exim  
 Option .

### 12.2.2. TLS

Incoming TLS , Client Host **tls\_verify\_hosts** Option  
 . Option . TLS  
 .

```

tls_verify_hosts = *

```

Client Host 가 List , Option .

- **tls\_verify\_chphers** cipher List Colon . List OpenSSL  
 , List colon ; Exim

```

tls_verify_ciphers = DES-CBC3-SHA:IDEA-CBC-MD5

```

- Option , TLS Session List Cipher .
- **tls\_verify\_certificates** .  
**tls\_verify\_certificates** 가 , Exim Client , Client 가  
 가 .  
 . 가 ,  
 <hash>.0 가 . <hash>  
 Hash . hash .

```
openssl x509 -hash -noout -in /etc/exim/cert/file
```

/etc/exim/cert/file

Option , Host

### 12.2.3. TLS Client

**tls\_hosts** Option Client Host 가 TLS 가 . Host 가 **tls\_hosts** , Host 가 **tls\_advertise\_hosts** , STARTTLS

**tls\_hosts** Host 가 TLS Session Message , MAIL

Error

503 Use of TLS required

### 12.2.4. TLS Session Relay

**tls\_host\_accept\_relay** Relay TLS Session . Host Relay  
. Relay , Relaying .

- Host 가 **host\_accept\_relay** .
- Host **host\_auth\_accept\_relay** .
- Host TLS Sessiong **tls\_host\_accept\_relay** .

, Client , **tls\_host\_accept\_relay** Option

### 12.2.5. TLS

**\$tls\_cipher** Incoming TLS Cipher . Incoming  
Message **Received:** Header Line . Message Log .  
, **tls\_log\_cipher** Option False . Exim Client , Message 가

Distinguished Name(DN) **\$tls\_peerdn** Option . Text

, Log Line **Received:** header line . **tls\_log\_peerdn**

Log DN= , **Received:** Header Line

**received\_hader\_text** Option 가 .

### 12.2.6. TLS (Exim Client)

**tls\_log\_cipher** **tls\_log\_peerdn** Option Incoming Message 가 Outgoing SMTP  
. **tls\_log\_peerdn** Option Server Distinguished Name Logging . TLS  
Client Option Option SMTP Transport Option .

Exim Client TLS SMTP Transport Option 가 . TLS 가  
 Server , SMTP Transport TLS Session , TLS 가  
 Server Host **host\_avoid\_tls** [5] Option Option Server Host  
 TLS .

TLS Session 가 Temporary [6] , Host .  
 가 Host 가 , Host ; , **STARTTLS**  
 5xx Error Code , Server 가 **host\_require\_tls** Option , SMTP Transport  
 Message .

Server TLS Option smtp transport Option 가 .

- Client 가 , **tls\_certificate** **tls\_privatekey** Server Client  
 . [7]
- tls\_verify\_certificates** **tls\_verify\_ciphers** Server ; Option  
 Server , Cipher .

Option Client 가 Server IP **\$host** **\$host\_address** 가  
 Option .

[1] **Secure Sockets Layer(SSL)**

[2] Apache Web Server SSL 가 .

[3] 4 . .

[4] **STARTTLS** Host .

[5] Transport Option

[6] , **STARTTLS** 4xx

[7] Server 가 Exim , **tls\_verify\_certificates** 가 .

**12.3. TCP/IP SMTP**

TCP/IP SMTP Exim Host Message .

12.3.1. TCP/IP Outgoing SMTP

TCP/IP Outgoing SMTP smtp transport . **EHLO** **SIZE** Parameter Server 가  
 , Exim MAIL **SIZE=n** 가 . n Message Size Transport  
 가 Header Line, Transport Filter , Message 가  
**size\_addition** Option [1] .

Exim SMTP Build , Remote Server 가 AUTH ,  
**auth\_hosts** , Exim Client , Message  
 , 가 , Exim  
 Message .

Message 가 , [\[2\]](#) Host  
 SMTP , Domain 가 smtp transport **max\_rcpts**  
 Option SMTP , **max\_rcpts**  
 Group . **remote\_max\_parallel** 1 ,  
 Session . Host 가 MX 가 가

smtp transport 가 Message 가 Temporary , Exim transport DB Update .  
 DB Hostname Index Record , Record Host Message  
 가 DB Update . Exim Hint DB  
 Hostname IP 가 Host 가 ,  
[8](#) .

Message 가 TCP/IP SMTP , Host Queue  
 Message 가 , Exim Transport 가 Hint DB . Message 가 , **-MC**  
 Option [\[3\]](#) Exim Process . TCP/IP Socket Process .  
 Process Host Message . Socket Process  
 , Queue Run , Queue Runner Process  
 가 Queue Message .

smtp transport **batch\_max** Option TCP/IP Message .  
 Message IP square bracket(<>) asterisk(\*)  
 가 Main Log .

### 12.3.2. TCP/IP Incoming SMTP Message

TCP/IP Incoming SMTP Message 가 : Daemon Inetd  
 . inetd /etc/inetd.conf .

```
smtp stream tcp nowait mail /usr/bin/exim exim -bs
```

Exim -bs Option Local User Agent Socket 가 가  
 , Exim 가 Remote Host 가 Daemon  
 Inetd Server , Log .



log\_smtp\_connections Option Remote Host Log

가 Disk message\_size\_limit check\_spool\_space ,

smtp\_check\_spool\_space Option false , SIZE 가 MAIL

. Disk , Temporary Error 가 . Disk check\_spool\_space

SIZE Incoming Message 가 check\_spool\_space

Disk .

Message 가 , Exim Data dot(.) Local

Message ID .

250 OK id=13M6GM-0005kt-00

Remote Host 가 Text log , 가 Message

. Exim Incoming SMTP .

[11](#) .

12.3.3. VRFY EXPN

RFC 821 Debugging 가 SMTP

: VRFY email , EXPN alias Mailing list List . , Internet

Message 가 Host , Mail Administrator

Mail Mail Hub Gateway Administrator

Exim . VRFY smtp\_verify Option

252 VRFY not available

Client Message VRFY Error Code 가

Code(252)가 . VRFY 가 , Exim -bv Option ,

Code 가 .

EXPN Host 가 smtp\_expn\_hosts . single-level .

EXPN (-bv Option) Test(-bt Option) . Unqualified Local Part 가 EXPN

, qualify\_domain qualify .

VRFY EXPN main reject log , VRFY RCPT

main log .

### 12.3.4. ETRN

RFC 821 Client Server **TURN** , Client 가 Outgoing  
 Mail , Incoming Message Server 가 **TURN** RFC 821  
**TURN** , 가 .

RFC 1985 **TURN** **ETRN SMTP** . Client 가  
 Dial-up Sever .

**ETRN** **releasing** Message . **releasing** Message **ETRN**  
 (connection) . TCP/IP Route ,  
**TURN** . Exim **ETRN** , **ETRN**  
 Exim . Exim Host Message Queue  
 , " Host **Message**" . Server 가 Dial-up System  
 , Mail 가 , Mail Host  
 Directory Local File . **ETRN** File Message  
 , Program .

**ETRN** Host Domain 가 . Exim  
 # Text . Text , SMTP  
 Server . **ETRN** -R Option Exim , -R Option  
**ETRN** Text 가 .

```
ETRN #brigadoon
```

```
ETRN Exim .
```

```
exim -R brigadoon
```

**brigadoon** Text , Message ,  
 Message 가 . Host Domain .  
 Exim **ETRN** Host 가 smtp\_etrn\_hosts **ETRN** [\[4\]](#) 가 .  
**smtp\_etrn\_hosts** Host **ETRN** main reject log ; **ETRN**  
 , Mail log .  
**smtp\_etrn\_serialize** [\[5\]](#) Option , **ETRN** ,  
 Queue Run . Client 가  
 Queue Runner . Process 가 **ETRN** Record , HInt  
 DB Exim . Hint DB -R queue .

System Program Crash , Hints Records ,  
 Exim 6 Record , System Rebooting **spool/db** Directory  
**serialize-** File .  
**ETRN** , **smtp\_etrn\_command** Option . Option  
 가 , **ETRN** .

```
smtp_etrn_command = /etc/etrn_command $domain $sender_host_address
```

, . \$domain **ETRN**  
 . Process  
 . Exim Incoming SMTP , UID GID  
 : Exim **-R** Option **smtp\_etrn\_command** ,  
**smtp\_etrn\_serialize** Disable . Hint , **ETRN** Hints 가

[\[1\]](#) 1024

[\[2\]](#) , Envelope sender

[\[3\]](#) Process Root Exim 가 .

[\[4\]](#) .

[\[5\]](#) .

#### 12.4. PAM

SPAM Mail , Mail 가 , Mail Server  
 Setting 가 Administrator Relay . [11](#)  
 Relay 가 . Relay 가  
**host\_accept\_relay** Option IP Relay .  
 가 . Computer  
 Mail System 가 .  
 Mail System Administrator 가 " **Mail System** " ,  
 " .. " , "  
 가 가 Mail Administrator .  
 , Mail System Linux 가 Login ID Password

Exim Plaintext, Cram-md5 Mechanism , Mail 가  
 Mechanism Mail System Passwd 가 . MySQL,  
 LDAP 가  
 가 PAM  
 PAM PAM  
 Exim PAM Module Compile . Debian PAM Exim  
 가 .  
 가 .

#### 12.4.1.

Exim PAM Module PAM Package **pam\_unix** patch . **pam\_unix** source  
[Linux-Pam](#) Package Source . **pam\_unix** PAM Module Program  
 가 Program root  
 . Exim PAM Module Exim Exim  
 UID/GID , Makefile  
 MINUID .  
 : PAM TLS Session ID  
 Password base64 Encoding 가 . exim-tls Package  
 Session .

#### EXIM-MTA

- Linux-Pam
- PAM Compile EXIM-MTA
- TSL ( 가 .)

#### 12.4.2.

가 [Linux-Pam](#) Package Source [pam\\_exim](#) Module Download . Linux-PAM Source Package  
 , Source Directory Pam\_exim Module . Linux-PAM Package Source 가  
 Directory Linux-PAM . modules/pam\_exim/unix\_chkpwd.c Line **EXIMUID**  
**EXIMGID** Exim UID/GID .

```
#define MINUID 500
#define EXIMUID 8
#define EXIMGID 12
```

Debian Exim mail UID GID 8 .

```

Linux-PAM Directory ./configure Make.Rule _pam_aconf.h .
_pam_aconf.h libpam/include/security . PAM Linux_PAM
Directory make install . PAM pam_exim Module
modules/pam_exim make .

modules/pam_exim/ exim_chkpwd pam_exim.so 가 . exim_chkpwd /sbin
, pam_exim.so /lib/security .

```

### 12.4.3. PAM

```

/etc/pam.d/exim 가 .

```

```

#%PAM-1.0
auth required pam_exim.so
account required pam_permit.so

```

### 12.4.4. Exim Server

```

가 exim.conf Relay Host
. Main Section Option .

```

```

host_auth_accept_relay = *

```

```

Outgoing Relay . Exim-tls Package
Relay session . Main
Section Option .

```

```

auth_over_tls_hosts = *

```

```

Relay Session . Exim
Session .

```

```

#####
# AUTHENTICATION CONFIGURATION #
#####

plain:
    driver = plaintext
    public_name = PLAIN
#    server_condition = "${if pam{$2:${sg{$3}{:}{:}}{yes}{no}}"}
    server_condition = "${if pam{$2:$3}{yes}{no}}"}

```

```

server_set_id = $2

login:
    driver = plaintext
    public_name = LOGIN
    server_prompts = "Username:: : Password::"
#    server_condition = "${if pam{$1:${sg{$2}{:}{:}}}{1}{0}}"
    server_condition = "${if pam{$1:$2}{1}{0}}"
    server_set_id = $1

end

```

#### 12.4.5. Client

Error . Server . Client

M\$ Outlook Express . Windows

가 .

- 가
- 
- Email
- Mail Server Mail Server .
- 

Session Outlook Express

가 .

Check .

Check . Client

Session Mail Relay 가 . Exim 가 가

Outlook Express 가

: Mail Server Mail Administrator .

Mail Server SSL 가 .

## 13 . Exim Command-Line Interface

### 13.1. [Input Mode Control](#)

13.1.1. [Daemon Process](#)

13.1.2. [SMTP](#)

13.1.3. [SMTP](#)

13.1.4. [Option](#)

### 13.2. [가 Message Data](#)

13.2.1. [Sender Address](#)

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### 13.3. [\\_\\_\\_\\_\\_](#)

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### 13.5. [Queue Runner Process](#)

13.5.1. [Retry Freezing Override](#)

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13.5.5. [Message](#)

13.5.6. [\\_\\_\\_\\_\\_](#)

13.5.7. [Queue Runner Option](#)

### 13.6. [Override](#)

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### 13.8. [Message](#)

13.8.1. [Message List](#)

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13.8.3. [Queue Message](#)

13.8.4. [Message Option](#)

### 13.9. [Testing Option](#)

13.9.1. [Test](#)

- 13.9.2. [Testing](#)
- 13.9.3. [Incoming Test](#)
- 13.9.4. [Retry Rule Testing](#)
- 13.9.5. [Rewrite Rule Testing](#)
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- 13.12. [Embedded Perl Option](#)
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- 13.14. [Exim](#)

Exim , Exim Option 가 . Exim Shell  
**Command-line interface** . , Exim  
 MUA Program , **Command Line** 가 . Option

Command Line Option Sendmail 가 . Exim Sendmail 가 .  
 Sendmail Option Exim 가 Option . Option Exim

Command Lind Option 가 . Group 가

**Input Mode Control**

Incoming Message Process Option.

**Additional Message Data**

Incoming Message 가 Option

**Immediate Delivery Control**

Type , Message 가 Option.

**Error Routing**

Message Error Option.

**Queue runner processes**

Queue Runner Queue Runner 가 Message Option.



## Configuration Overrides

Option.

### Watching Exim

Queue Message Option

### Message Control

Message Option

### Testing

, Filter File, , Rule Option

### Debugging

Exim Debugging

### Internal

Exim Instance 가 Option

### Miscellaneous

### Compatibility with sendmail

Sendmail Option. Exim .  
Option . [Exim Site Reference Manual](#) Option  
List .

### 13.1. Input Mode Control

4 Option Message .

### 13.1.1. Daemon Process

Exim **-bd** Option , Daemon Process SMTP Protocol , TCP/IP Remote Host Message . SMTP Port 25 , **-oX** Option Port .

```
exim -bd -oX 7759
```

7759 Port Daemon Process Exim Application Mail Service Daemon Exim Test Admin Daemon Process .

### 13.1.2. SMTP

Exim **-bs** , Process SMTP . Option Local Process ; , Message 가 SMTP Session , Message 가 Trusted 가 , MAIL Sender . **-bs** Option Remote Host Message Process Daemon , **inetd** Super Daemon . Super Daemon /etc/inetd.conf 가 .

```
smtp stream tcp nowait mail /usr/sbin/exim exim -bs
```

Exim Message 가 socket , **-bs** Option . IP 가 , Socket Process **inetd** Sender .

### 13.1.3. SMTP

Exim **-bm** Option , Process Message Body , List . Exim Option , Option 가 . Message 가 .

```
exim pcharley@pcharley.net
```

```
<message>
```

Message RFC 822 Header Line . Header 가 Exim 가 . , Message **end-of-file** [1] , Message Dot(.) . Dot **-i** **-oi** Option .

-t Option Message Envelope Recipients . Option ,  
 . Bcc: Header Line 가 . Bcc: Header Line  
 Message .

```
exim -t
From: pcharley@pcharley.net
To: force@force.net
Bcc: ssrack@trash.net
...
```

pcharley@pcharley.net force@force.net Message Bcc: Line  
 . Bcc: Line Exim . Message Bcc:  
 Line , .

-t Option 가 , 가 가 :  
 Header Line List . , Exim Sendmail  
 . Sendmail Header Line  
 . Header Line 가 aliasing Forwarding  
 , . .

```
exim -t hyunduck0@example.com
From: pcharley@example.com
To: force@example.com
Cc: alias@example.com
...
```

alias@example.com hyunduck0@example.com ,  
 Message hyunduck0@example.com . alias@example.com 가  
 Host Alias 가 ; Message 가 alias@example.com ,  
 가 . , .  
 , Sendmail . , List  
 가 . Exim Option .

```
extract_addresses_remove_arguments = false
```

To: Cc: 가 Bcc: .  
 -bm -t Option Message Unix , Linefeed  
 Line Exim 가 . Interface User Agent

가 [\[2\]](#) Program  
 Exim **-dropcr** Option . Option , Carriage-return  
**-or** Option non-SMTP Message ; **accept\_timeout** Option  
 Override . **-or** Option , Exim Data .

#### 13.1.4. Option

### 13-1. Input Mode Option

Option	Meaning
-bd	Daemon Exim .
-bs	SMTP , Local Process inetd
-bm	Message , .
-t	Message , Header Line .
-dropcr	Carriage-Return .
-r	SMTP

[\[1\]](#) CTRL-D end-of-file .

[\[2\]](#) Carriage Return linefeed(CRLF)

### 13.2. 가 Message Data

Option TCP/IP 가 , Local Process Message 가 Data .

#### 13.2.1. Sender Address

**-f** Option Message Login Override Sender .  
 Message 가 Trusted User [\[1\]](#) 가 , Mail Domain **force.net**  
 Host , root 가

```
exim -f pcharley@pcharley.net force@pcharley.net
```

root Trust User , Message Envelop Sender root@force.net  
 pcharley@pcharley.net . **-f** Option Trust User 가 . Exim

Release 3.20 , **untrusted\_set\_sender** Option Untrust User **-f**  
 Option , **-f**

```
exim -f '<>' pcharley@example.com
```

Envelope Sender Nontrusted User Envelope Sender Message  
 Bounce Message Bounce Message RFC  
 Message Nontrusted User 가  
 Exim , **-f** Option Envelope Sender 가  
**no\_local\_from\_check** Option , **From:** Header Real Sender  
**Sender:** Header 가 Trusted  
**-f** Option , Message From Line Sender  
 Override

### 13.2.2. Sender Name

Exim Local Sender **Sender:** Header **From:** Header , **gecos** Password File  
 Field Message System Password

```
Sender: The Boss <boss@pcharley.net>
```

"The Boss" **-F** Option override

```
exim -F 'PCHarley' force@pcharley.net
```

Password **gecos** field , Option Trusted  
 User

### 13.2.3. Remote Host

Message 가 , Trusted User 가 Incoming SMTP  
 , **-oM** Option Message Remote Host 가  
 Option

- **-oMa** Remote Host IP Field
- **-oMi** Local Host Message Interface IP 가 Field ,
- **-oMr** Message Protocol Logging ;
- **-oMs** Remote Host 가 Field
- **-oMt** Sending Host RFC 1413(ident) Callback  
 가 Field

Nontrusted 가 Host Filter File -bh, -bf, -bF Option Option  
 TCP/IP SMTP , Option Nontrusted ,  
 Testing , -oM Option Mail SMTP Protocol Remote Host

[\[11\]](#) Trusted User Main Section

```
trusted_users = mail
```

13.3.

Option Message 가 Message ; , Option  
 Process . Testing 가 .  
 -odb Option Daemon Mode Exim Incoming Message Mode .  
 Message Background , Message Process  
 Message Process Exim Processs 가  
 . -od Option .  
 Exim Message , -odf -odi Option foreground .  
 , Exim Message Process Process .  
 , Exim Process , Process Process 가  
 . Process 가 .  
 -odq Option Daemon Mode Incoming Message Mode .  
 Process 가 Message . Message  
 Queue Queue Runner Process 가 Queue . queue\_only  
 Option 가 .  
 Incoming Message 가 -odq Option . -odqr Message  
 Exim Local . Remote Route . Remote Queue  
 Runner . queue\_remote\_domains Option Domain 가 .  
 , -odqs 가 , Local .  
 SMTP , Option . Message Queue  
 Runner Process 가 Queue . Routing , Exim  
 Message 가 Host , Host Message ,

SMTP . **queue\_smtp\_domains** Option Domain  
 가 .

### 13.4. Error Routing

Exim non-SMTP Message Error , Sender Mail Message ,  
 Error File Message . 가 Option  
 가 .

- **-oem** , Error Message . Error 가 Message 가  
 , Exim Return Code 2 . Return Code 가 1 .  
 Option .
- **-oee** 가 , Error Message , Error Message 가  
 , Exim Return Code Zero . Error Message 가 ,  
 Return Code **-oem** .
- **-oep** 가 , Error Error Stream Message , Return Code 1 .

**-f** Option Sender 가 , Sender 가 , Error  
 Message Option Error Stream .

### 13.5. Queue Runner Process

Queue Runner Process Daemon , Daemon  
 Cron . Queue Runner Process Admin

```
exim -q
```

Queue Queue Runner Process . Queue Runner Process 가  
 Daemon .

#### 13.5.1. Retry Freezing Override

Queue Runner Process Unfrozen Message Retry 가 Address .  
**-q** Option . **-qf** 가 Retry Queue Runner  
 Process . Frozen Message . **-qff** 가 Frozen  
 Message Queue Runner Process .

exim -qff

Message

### 13.5.2. Local Queue Runner Process

**-qfl** Option Queue Runner Process **loca\_domains** Local

### 13.5.3. Remote Queue Runner Process

Queue Message 가 Message Host  
 Route Message SMTP  
 Internet Host  
 , Exim Host Route Message , Message  
 SMTP **-q** Option 가 q (**-qqff**), Queue Runner  
 Process , Remote Route ,  
 Host Message DB Host  
 , Update , Queue Runner Process 가  
 , Directin, Routing, Host Route Message Queue  
 Hints , SMTP

### 13.5.4. Queue Runner Process

Queue Runner Process . Exim Daemon **-q** Option 가

exim -q20m

20 Queue Runner Process Daemon . **-q** Option Queue  
 Runner Incoming SMTP Daemon **-bd**  
 Option

exim -bd -q30m

, Daemon OS Boot Script , Script  
 /usr/sbin/sendmail /usr/lib/sendmail . Script Sendmail Exim  
 . Sendmail Exim Binary 가  
 , **-q** Option 가

exim -qff4h



#### 4 Queue

##### 13.5.5. Message

Queue Runner Process Queue Message 가  
 Message Queue Runner Process ,  
 Offline Host 가 Online , Message Host 가 Down  
 .  
 -q -qf Option Message ID , ID Message .

```
exim -qf 0t5c6f-0000c8-00
```

Message ID , 0t5c6f-0000c8-00 Message  
 ID 가 , ID 가 Message .  
 Queue .

##### 13.5.6.

Queue Runner Process Sender Recipient 가 Message  
 . -S -R Option Sender Recipient . -S -R  
 Option , 가 . -R , 가  
 Message .

```
exim -R force.net
```

**force.net** Message , Message  
 Process . Local Part Domain . @ 가  
 Local Part Domain .  
 , -Rr -Sr .

```
exim -Rr '(pcharley|kerbung)\.force.net$'
```

가 pcharley.force.net kerbung.force.net , Message 가

Message 가 , Process 가 , -R  
 , 가 . Message , Exim Retry  
 Override . -Sf, -Sff -Rf, -Rff 가  
 , Message ; ff Frozen Message .

-R Option Host 가 Down , Domain Message .

### 13.5.7. Queue Runner Option

#### 13-2. Queue Runner Option

Option	Meaning
-q	Queue Runner
-qf	Queue Runner
-qff	Frozen Message Queue Runner
-ql	Local Domain Queue Runner
-qfl	Local Domain Queue Runner
-qffl	Frozen Message , Local Domain Queue Runner
-R	Queue Runner
-Rf	Queue Runner
-Rff	Frozen Message , Queue Runner
-Rr	Queue Runner
-Rrf	Queue Runner
-Rrff	Frozen Message , Queue Runner
-S	Sender Queue Runner
-Sf	Sender Queue Runner
-Sff	Frozen Message , Sender Queue Runner
-Sr	Sender Queue Runner
-Srf	Sender Queue Runner
-Srff	Frozen Message , Sender Queue Runner

-q Option -qq 가 Queue Runner Process .

Option Queue Runner Process Daemon 가

### 13.6. Override

Exim Build-time Binary . Exim Process  
 root Setuid Program . Runtime  
 , Testing  
 . Runtime -C Option  
 가 .

```
exim -C /etc/exim/alt.config
```

Exim root Exim Build-time  
 , Exim root Exim .  
 Runtime Macro . -D Option Override .

```
exim -DLOG_LEVEL=6
```

Exim 가 root Exim 가 , Exim Option root . -D  
 Option .

### 13.7. Exim Queue

Admin Exim Queue Message Option 가 .  
 X Window System Server , **Exim Monitor(eximon)**  
 가 . , **eximon** 가 .

Admin Queue Message 가 .

```
exim -bp
```

Option , 가 Message .  
 Message .

```
25m 2.9k 0t5c6f-000c8-00 <pcharley@pcharley.net>
force@force.net
...
```

Message 가 Queue ( 25 ) , (2.9K), local ID, Envelope Sender 가  
 . Bounce Message Sender <> . Line Line  
 Envelope Recipient 가 . Envelope Recipient 가 , Recipient D 가 ;  
 Forwarding Aliasing , D 가

**-bp** **-bpu** 가 , **-bpa** 가 ,  
 가 가 **-bpr** , Message 가 . -  
**bpr** Option Queue Message 가 가 .  
**-bpra, -bpru** ,  
**-bpa, -bpu** .

### 13.8. Message

Admin Queue Message , **-M**  
 Option .

#### 13.8.1. Message List

Option Message ID 가 ; Message

```
exim -M 123H3N-000my-00 0t5C6f-000c8-00
```

**-M** Option Message ID Message Process .  
 Retry Override **queue\_remote\_domains** **hold\_domains** Option . ,  
 Recipient **Message** (Forcing Message  
 Delivery)

**-Mf** Message Freeze , **-Mt** Freeze Message . **-Mt** 가 Message , Exim  
 Filter **manually\_thawed** True .

**-Mg, -Mrm** Message 가 . **-Mg** [1] "delivery cancelled by administrator" Error  
 , Sender Bounce message . **-Mrm** Bounce Message  
 Spool Message .

Message Process 가 , Option , Error Message  
 . **-M** Option Admin Main Log .

#### 13.8.2. Queue Message

Spool Message Admin ; Message ID -  
**Mvb, -Mvh, -Mvl** Option Body(-D file), Header(-H file) Message Log File .

```
exim -Mvl 123H3N-0003mY-00
```

Message 123H3N-0003mY-00 Log

13.8.3. Queue Message

Option Amdin 가 Queue Message . Option  
Message . Option message ID ; Option  
가 Data .

Message -Mar, -Mmd, -Mmad Option 가 . -Mar 가

```
exim -Mar 123H3N-0003mY-00 force@force.net
```

Message 123H3N-0003mY-00 force@force.net 가 .  
Exim 가

```
exim -Mmad 123H3N-0003mY-00
```

```
exim -Mmd 123H3N-0003mY-00 pcharley@pcharley.net
```

pcharley@pcharley.net

Message 가 , 가

- Exim Process Message , -Mf  
Message Freeze
- -Mmad . -Mmd
- 가 -Mar
- -Mt Message Unfreeze , -M Option

-Meb Option Message Envelope Sender

```
exim -Mes 123H3N-0003mY-00 newsender@pcharley.net
```

Sender , Sender <> . Bounce

Message

Message ID -Meb Option Messgae Body 가 .

**VISUAL** , **VISUAL** 가 , **EDITOR**  
 , **vi** , Message Body 가  
 Spool , Editing Spool  
 Message Lock ,  
 : Spool File Line

### 13.8.4. Message Option

#### 13-3. Queue Runner Option

Option	Meaning
-M	Message
-Mar	Message 가
-Meb	Message Body
-Mes	Message Sender
-Mf	Message Freeze
-Mg	Message (Bounce)
-Mmad	Message
-Mmd	Message
-Mrm	Message (No Bounce)
-Mt	Message Unfreeze
-Mvb	Message Body View
-Mvh	Message Header View
-Mvl	Message Log View

[\[1\]](#) g Give Up( ) .

### 13.9. Testing Option

Exim Testing, Option .

13.9.1. Test

Exim Binary 가

```
exim -bV
```

Exim Virsion , Date  
가 Error 가 Error Message Error

Section Option , Exim Main  
Admin 가 DB Access Password 가 hide

Option Option 가

```
exim -bP qualify_domain local_domains
```

Exim

```
exim -bP configure_file
```

Driver Driver Section(directors, routers, transports,  
authenticator) 가

```
exim -bP transport local_delivery
```

Section , Section Driver 가 Section Option  
directors, router, transport, authenticators

```
exim -bP authenticators
```

Section Option List director\_list, router\_list, transport\_list, authenticator\_list

```
exim -bP director_list
```

Option

```
system_aliases
```

```
cancelled_users
real_localuser
userforward
localuser
```

### 13.9.2. Testing

Exim Message 가 ; **-bt**  
Option Message Testing 가 .

```
# exim -bt pcharley@test.domain.com
pcharley@test.domain.com
deliver to pcharley@test.domain.com
router = lookuphost, transport = remote_smtp
host mail.test.domain.com [192.168.1.10] MX=10
host mail1.test.domain.com [192.168.1.11] MX=30
```

router Section **lookuphost** Driver 가 , **lookuphost** Host  
List Transport Section **remote\_smtp** Driver Route 가

#### Debugging Option

**-bv, -bvs** Option Exim Recipient Sender ,  
. Directors Routers 가 [\[1\]](#) Option  
, **-bt** , Driver **verify\_sender**

**verify\_recipient** **-bv** **-bvs** 가 .

Test 가 . Routing Directing Process 가 Message  
Data , Message 가 가 .  
Mailing List 가 Queue Disk 가 Server  
가 , [\[2\]](#) Message . Header Line  
Mailing List Message 가 .

```
Precedence: list
```

Exim Router .

```
list_to_server:
driver = domainlist
condition = ${if eq {$h_precedence:}{list}{yes}{no}}
transport = remote_smtp
route_list = * server.name.example byname
```



, Test -bt , Condition , router

### 13.9.3. Incoming Test

Mail Host ,  
-bh Option . IP

, Exim 가 SMTP Session . Test 가

, 가 .

SMTP 가 ; Relay ,

RCPT

Test Log Spool File . Test 가 .

Test . Session Testing .

```
exim -bh 192.168.1.105
```

192.168.1.105 가 SMTP Session .

```
**** SMTP testing session as if from host 192.168.1.105
```

```
**** Not for real!
```

Exim

```
>>> host in host_lookup? yes (end of list)
```

Exim Host 가 host\_lookup Option Item , yes ,  
List . 가 ? host\_lookup Item Item [3]  
, List no 가 yes .

```
>>> looking up host name for 192.168.1.105
```

```
>>> IP address lookup yielded mail.example.domain.net
```

host\_lookup Item IP 가 , Exim Hostname DNS .  
Hostname mail.example.domain.net .

```
>>> Alias mail
```

```
>>> host in host_reject? no (option unset)
```

```
>>> host in host_reject_recipients? no (option unset)
```

가 Option ; , Host

Test . RBL rbl\_domains Item  
Test 가 .

```
>>> host in rbl_hosts? yes (*)
>>> RBL lookup for 105.1.168.192.dialups.mail-abuse.org succeeded
>>> => that means it is black listed....
>>> See <http://mail-abuse.org/dul/>
LOG: recipients refused from mail.example.domain.net
[192.168.1.105] (RBL dialups.mail-abuse.org)
```

rbl\_hosts Item \* , Host rbl\_hosts Item . Exim rbl\_domains  
Domain Hostname . dialups.mail-abuse.org .  
Hostname dialups.mail-abuse.org , Host Blacklist . URL  
DNS TXT Record . LOG: Line SMTP Session Log  
file . Host Blacklist Message .

```
220 mail.example.domain.net ESMTP Exim 3.35 #1 Fri, 01 Aug 2003 15:30:28 +0900
```

Exim Testing , Remote Host . SMTP [\[4\]](#)  
Client .

```
helo mail.example.domain.net
>>> mail.example.domain.net in local_domains? no (end of list)
250 client.example.domain.net Hello mail.example.domain.net [192.168.1.105]
```

Exim HELO Local Host . [\[5\]](#)  
가 . HELO , MAIL, RCPT, DATA Message  
Exim . QUIT Test CTRL-  
C 가 .

#### 13.9.4. Retry Rule Testing

가 , -brt Option Retry Rule  
. Exim Retry Rule . 가 .

```
$ exim -brt retry.example.domain.net
Retry rule: *.example.domain.net F,2h,15m; F,4d,30m
```

Mail 가 , Domain . Domain  
 ; Retry Rule ,  
 . Remote Host Retry Rule Exim .  
 Host Rule , Mail Domain .  
 가 Error .

```
exim -brc retry.example.net example.net timeout_connect
```

"example.net Domain 가 Message , Host  
 retry.example.net Retry Rule 가?" .

### 13.9.5. Rewrite Rule Testing

Rewritign Rule Test -brw Option .

### 13.9.6. Filter File Testing

System Filter Testing -bf -bF Option .

[1] , verify\_only

[2] Mailing List 가 List Server

Mailing List 가 .

[3] Item .

[4] HELO EHLO SMTP .

[5] , DNS .

### 13.10. Debugging Option

Exim Program ,

. -d Option Exim Debugging Error

. Debuggin Option ;

. -d , -d1 , -v, -ov [1] Option

-d9 Option 가 가 ; -d10 가 Filter File

; -d11 가 DNS Debuggin Option .

Debuggin Exim 가 .  
 Administrator , **-bt** Option 가 ,  
 Message 가 Debugging Option , 가 Directors Routers  
 가 . SMTP 가 , SMTP Debugging .

**-dm** Option Error Error Message Memory  
 . Exim 가 .

### 13.10.1.

[13.9.2](#) **-bt, -bv** , Message .  
 Test 가 **-N** Option . Transport Message  
 Debugging Option . Option **-d1** Option . Option  
 Exim 가 , Message 가 . ,  
 . , Retry DB Update , Log Entry => 가  
 \*>

**-N** Option , ,  
**-N** Option .  
**-N** Option Mail , root Exim **-bd, -q, -R -M**  
 Message Incoming  
 Message .

[\[1\]](#) v verbose .

### 13.11. Terminating Option

Pseudo-Option Option Hyphen .  
 Item Hyphen Option .  
 가 , Hyphen email Local part .

```
exim -- -badlocalpart@bad.example.net
```

### 13.12. Embedded Perl Option

Embedded Perl Interpreter , **-pd, -ps** Option .

### 13.13. Sendmail

Exim Option Sendmail 가 . Exim Sendmail  
 , Option , . Sendmail  
 Option MUA Option Option .

- Option Exim : **-B, -h, -n, -m, -om, -oo, -x**
- **-e** Option **-oe**
- **-oep, -oew** **-oeq** **-oem**
- **-i, -oittrue** **-oi**
- **-r** **-f**
- **-qR, -qS** **-R, -S**

Sendmail **-bi** Option Alias File Rebuild [\[1\]](#)

Exim Alias File 가 ; **aliasfile** Director [\[2\]](#)  
 . Exim Alias File **DBM** **cdb** file **Rebuilding**

MySQL DB NIS **Rebuilding**

System Boot Scrip **newaliases** **-bi** Option **/usr/sbin/sendmail** . Exim  
**-bi** Option

```
bi_command = /the/path/to/some/command
```

Option Exim UID/GID **bi\_command**  
 가 , **-oA** Option

[\[1\]](#) Sendmail Alias File DB Rebuild **ndaliases**

[\[2\]](#) 가

### 13.14. Exim

가 Mail , MTA . Exim ,  
 Option , Option Shell Script  
 가 . Exim , Symbolic Link , Option  
 가 .

## mailq

Queue List, **-bp** Option 가 .

## rsmtplib

SMTP, **-bS** Option 가 .

## rmail

**-i**, **-oee** Option 가 . UUCP System .

## runq

Queue Runner Process, **-q** Option 가 .

Exim Scrip [\[1\]](#), Administrator 가 Symbolic

Link .

[\[1\]](#) Debian .

## 14 . Admin Exim

### 14.1. [Log Files](#)

### 14.2. [Log](#)

#### 14.2.1. [Syslog Log](#)

#### 14.2.2. [Log Level](#)

#### 14.2.3. [Log Option](#)

### 14.3. [Mail Log](#)

#### 14.3.1. [Message Log](#)

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#### 14.3.5. [Message](#)

#### 14.3.6. [Log](#)

### 14.4. [Exim Log File](#)

### 14.5. [Log File](#) 가

#### 14.5.1. [exigrep](#)

14.5.2. [eximstats](#)

14.6. [Exim](#)

14.6.1. [exiqsumm](#)

14.6.2. [exinext](#)

14.7. [Exim Monitor](#)

14.7.1. [Monitor](#)

14.7.2. [Stripchart](#)

14.7.3. [Main Button](#)

14.7.4. [Log Display](#)

14.7.5. [Queue Display](#)

14.7.6. [Queue Menu](#)

14.8. [Alias Datafile](#)

14.9. [DBM File](#)

14.10. [Hints Database](#)

14.11. [Mailbox](#)

Exim, Mail Service  
Mail 가 .

Administrator Exim, exiwhat Utility  
Exim Process, Log File Main Log Entry Monitor  
. **exigrep** Script Utility Log Entry

Log File 가 ; Log File [\[1\]](#), Log .  
OS Log File 가 ; Log File OS  
Exim **exicyclog** Script Utility .

, Exim Loggin Mechanism, Message 가 Log Entry, Log  
Option, Exim Monitor,  
Exim Process 가, Alias Datafile, Hints Database,  
Mailbox, .

[\[1\]](#)

### 14.1. Log Files

Exim **main, reject, panic** Logs, Log .

- Main Log Line Message . Log Log  
File 가 . Character Flag  
Line . Event Main Log ,  
Option .
- Reject Log Option [\[1\]](#) Message .  
Main Log Log , Message Header
- Error Error 가 Exim , Panic Log  
 , Panic Log . Error 가  
 , Panic Log . Panic Log  
 . [\[2\]](#) Exim Panic Log , System Log(Syslog)

Log File 가 , Message Log . Message  
Log Message ID . Spool Directory **msglog** Sub Directory .  
Message Log Message Main Log . Administrator 가  
Message . **preserve\_message\_logs** 가 ,  
Message Log Message 가 .

[\[1\]](#) Message .

[\[2\]](#) , Panic Log Cron job Administrator Mail

## 14.2. Log

Exim Log Local , Syslog . , Syslog 가 LocalHost 가  
Log Host Log , Syslog Log Log Host UDP  
 , SysLog Log Log Host Log 가 , Log  
Host Log 가 가 . [\[1\]](#)

Exim Log Binary 가 Build , **log\_file\_path** .  
 , Hostname .

```
log_file_path = /var/log/$primary_hostname/exim_%slog
```

Exim , Log Binary

Log



**log\_file\_path** Colon List , Item . [2] Item  
**Syslog** Syslog 가 ; Item **main, reject** **Panic** %s 가  
 , 가 . Option , Path Spool Directory  
**log/%slog** 가 . Path Option . 가 가

```
log_file_path=/usr/log/exim%s
log_file_path=syslog
log_file_path=:syslog
log_file_path=syslog : /usr/log/exim_%s
```

Log Data 가 , Syslog Log Data 가  
 . Paht Syslog 가 . Syslog  
 List 가 , Panic Log 가 .

#### 14.2.1. Syslog Log

Syslog Exim Log Log Format . Log File Syslog  
 . Syslog **LOG\_MAIL** Program Exim . System , **LOG\_PID**  
 Flag 가 , Syslog Log Hostname 가 PID 가 . Log  
 Stream Syslog Mapping .

1. Main Log **LOG\_INFO** Mapping .
2. Reject Log **LOG\_NOTICE** Mapping .
3. Panic Log **LOG\_ALERT** Mapping .

Log Line Main Reject Log , Syslog Log  
 Log . Exim Log , Reject Log  
 Header 가 Line . , Syslog Newline  
 가 Syslog , 1,000 .  
 Log . Component **[n/m]** **[n \ m]**  
 , n Component , m Component . Line  
 / ; Newline , \ .  
 , 1,000 70 , Main Log(**LOG\_INFO**)  
 Message , 가 Line Syslog 가 , Hostname Pid 가 .

```
[1/3] 1999-09-16 16:09:43 11RdAL-0006pc-00 rejected from [127.0.0.1] (ph10):
[2/3] syntax error in 'From' header when scanning for sender: missing or ma
[3/3] Iformed local part in "<>" (envelope sender is <ph10@cam.ac.uk>)
```

Error Reject Log(LOG\_NOTICE)

```
[1\14] 1999-09-16 16:09:43 11RdAL-0006pc-00 rejected from [127.0.0.1] (ph10):
[2\14] syntax error in 'From' header when scanning for sender: missing or ma
[3\14] lformed local part in "<>" (envelope sender is <ph10@cam.ac.uk>)
[4\14] Recipients: ph10@some.domain.cam.ac.uk
[5\14] P Received: from [127.0.0.1] (ident=ph10)
[6\14]     by xxxxx.cam.ac.uk with smtp (Exim 3.10 #27)
[7\14]     id 11RdAL-0006pc-00
[8\14]     for ph10@cam.ac.uk; Thu, 16 Sep 1999 16:09:43 +0100
[9\14] F From: <>
[10\14] Subject: this is a test header
[11\14] X-something: this is another header
[12\14] I Message-Id: <E11RdAL-0006pc-00@xxxxx.cam.ac.uk>
[13\14] B Bcc:
[14\14] Date: Thu, 16 Sep 1999 16:09:43 +0100
```

, Newline Log Line Syslog 가

1999-09-16 16:09:47 SMTP connection from [127.0.0.1] closed by QUIT

Syslog 가 Exim Timestamp ,

14.2.2. Log Level

Log\_level Option Main Log Data Data  
Zero Logging Level . Log .

14-1. Log Level

Level	Log
1	System Filter
2	Message Size
3	
4	SMTP
	SMTP , System Load 가
	SMTP
	log_smtp_connection , SMTP

	log_smtp_syntax_error가 , SMTP Error
	Load Level SMTP Message
5	가
	Spool File Lock ( Process가 Message .)
	Message Frozen
	Error Message
6	HELO EHLO

Log Level 6 가 Message . 6 Level . Log  
 Level 5 . Reject Log .

Log Level 5 , "Retry time not reached" Message Message Log  
 . Log Level 4 , Log .

#### 14.2.3. Log Option

Log Level Mechanism Administrator 가 Logging .  
 , Main Log Option . Option  
 Message Log Line . [Exim](#)

- [1] Log 10M , Log Log Host  
 System 가 , Syslog Modify 가 ;  
 Linux System , CPU Time 90% Syslog 가 .
- [2] Exim List Colon .  
 Option(log\_file\_path) . Colon .

#### 14.3. Mail Log

Main Log Line , Line . Data  
 Program Line . Line Timestamp

2003-09-01 01:07:31

Message                      Log Line                      가                      Timestamp                      flag                      가                      . flage

```
<=            Message
=>            Message
==            Message 가
**            Message
```

가 , -> \*>

### 14.3.1. Message            Log

TCP/IP                      Message                      Log                      .

```
2000-6-30 00:11:51 137nTL-0005br-00 <= holly@dwarf.example U=holly P=local S=811
id=Pine.SOL.3.96.1000630001852.21797A-100000@dwarf.example
```

```
<=            Address    Rewriting Rule                      Envelope Sender Address    . U Field            Exim
                 Process    Login                      .
```

```
Message 가            Host                      , Message                      , U Field            Message                      RFC 1413
                 H Feild            Message                      Host                      .
```

```
1995-10-31 08:57:53 0tACW1-0005MB-00 <= kryten@dwarf.example H=mailer.dwaft.example [123.123.123]
U=exim P=smtp S=5678 id=20000630091558.B12616@dwarf.example
```

```
Square bracket([ ])            Host    IP                      . H field                      ,            IP
                 [1]                      .                      ,            HELO            EHLO                      Host
                 .                      .                      HELO            EHLO                      ,
                 ,                      HELO            EHLO                      .            ,
```

Client    Fully Qualified Domain Name(FQDN)                      .

```
H=mm272.lucy.example (mm272) [192.168.215.229]
```

```
Host                      HELO            EHLO                      IP                      .                      Log
```

```
H=(10.21.32.43) [192.168.8.34]
H=([10.21.32.43]) [192.168.8.34]
```

Log Administrator 가 Square bracket([])

Message , P Field Message Protocol SMTP AUTH

Host Message asmtplib 가 ,

A Field server\_set\_id Option ,

Colon ,

A=fixed\_plain:ph10

Exim Version , Incoming Message Cipher X Field

X=TLSsv1:DES-CBC3-SHA:168

, tls\_log\_cipher False Exim Client

tls\_log\_peerdn Option , Distinguished DN Field

Log

Message Size S Field Byte Message 가 , Header

가 Message Size

ID Field Message-ID: Header Line Message 가 Line

Log Exim Message Message-ID 가

Error(Bounce) Message Sender Address <> Error Message ,

R Field Error Message Message ID 가

2000-06-30 00:49:27 137o3j-0005mU-00 <=> R=137o3e-0005mo-00 U=root P=local S=1239

Message ID 137o3e-0005mo-00 Bounce Message Log

Option 가 Data Message Log 가 log\_received\_sender 가 ,

from Message Sender 가 가 log\_received\_recipients 가 for

List 가 가 unqualified 가 qualified , rewriting [2]

log\_subject 가 , Header Line Subject: Log Line T Field [3] 가

가 , Envelope Sender 가 Rewriting Log 가

2000-06-30 00:11:51 137nTL-0005br-00 <= holly@dwarf.example U=holly P=local S=811

id=Pine.SOL.3.96.1000630001852.21797A-100000@dwarf.example

T="Testing subject" from <hc1009@mix.dwarf.example> for lister@dwarf.example hal@2001.example

14.3.2. Log

Log

```
1995-10-31 08:59:13 0tACW1-0005MB-00 = marv <marv@hitch.fict.book> D=localuser T=local_delivery
1995-10-31 09:00:10 0tACW1-0005MB-00 = monk@holistic.fict.book R=lookuphost T=smtp H=holistic.fict.book
[234.234.234.234]
```

**D, R, T Fields** Director, Router Transport H Field Remote Host

Director , => Field Local Part, File , Pipe  
 Line 가 Aliasing Forwarding  
 , 가 , 가  
 . **log\_all\_parents** 가 가 Log

Filter File Reply Message > . D T Item Director  
 Transport

```
2000-06-30 09:42:35 137wNf-0000ng-00 => >hermione@hws.thaum.example <harry@hws.thaum.example> D=userforward
T=address_reply
```

harry 가 hermione@hws.thaum.example Message Reply Filter File 가  
 . Log , Message Message Log

Directing Routing , Log Log

shadow , Log Line 가

```
ST=shadow transport name
```

shadow , Error Message  
 , 가 Router ,  
 .**log\_smtp\_confirmation** Option , Host Log Line  
 가 , Log C Field . Exim MTA  
 , Log Message

가 [4], => -> Flag 가 Mail  
 Program Message Log Line \* 가 IP Message 가  
 SMTP ,  
 Filter File **seen finish** Discard , Log

1998-12-10 00:50:49 0znuJc-0001UB-00 => discarded <low.club@trick4.bridge.example> D=userforward

System Filter File Discard , Log

1999-12-14 00:30:42 0znuKe-0001UB-00 => discarded (message\_filter)

-N Debugging Option , Log => -> \*> flag 가

### 14.3.3.

, Line Log .

1995-12-19 16:20:23 0tRiQz-0002Q5-00 == marvin@endrest.book T=smtp defer (146): Connection refused

, Error IP SMTP  
 Log , Log Line Log Line .

1995-12-19 16:20:23 0tRiQz-0002Q5-00 Failed to connect to endrest.book [239.239.239.239]: Connection refused

가 , log\_level Option 5 , Message Log

- "Retry Time not reached" 가 Direction Routing Temporary Error 가  
 , 가
- "Retry time not reached for any host" 가 Direction Routing Temporary  
 Error 가 , Route Host 가

### 14.3.4.

, Log 가 .

1995-12-19 16:20:23 0tRiQz-0002Q5-00 \*\* jim@trek99.film <jim@trek99.film>: unknown mail domain

log leve 5 , Error Message Log Line .

1995-12-19 16:20:25 0tRiQz-0002Q5-00 Error message sent to spock@vulcan.example

Message 가 가 , Exim 가 Bounce Message  
 , Log Line .

#### 14.3.5. Message

Message 가 Spool , Main Log .

1995-10-31 09:00:11 0tACW1-0005MB-00 Completed

0tACW1-0005MB-00 Log .

#### 14.3.6. Log

Log 가 . Log 가 . 가  
log 가 "Spool file is locked" . Exim Process 가 Message  
Message 가 Error 가 , Queue  
Runner process 가 , Log Message Log Level 5

, Log Message 가 Message , 가  
 . **exiwhat** Utility Exim Process 가 .

[\[1\]](#) Exim .

[\[2\]](#) SMTP rewriting

[\[3\]](#) **S size** , **topic** T 가

[\[4\]](#) , SMTP RCPT

### 14.4. Exim Log File

Exim log **syslog** local file , Main log Reject log  
 . Process Log File Rename Log File  
 . Cron Job . Cron  
Job . Log File Log 가 . Exim  
Process 가 Log 가 , Main Log File , Log  
File : , Message 가 .  
 , SMTP , Rename File .



, Exim File Main Log File , File  
 , Inode 가 , Log File Main Log File , Log  
 File Exim Process File Log  
 OS Log Script . Exim Exim Log  
**exicyclog** Script Utility . Utility Main Log Reject Log . Script  
 Cron Job Root .

```
1 0 * * * /usr/sbin/exicyclog
```

00:01 , Log File Exim , Exim  
 가 , Root . Exim Script  
 Cron Job .

```
1 0 * * * su exim -c /usr/sbin/exicyclog
```

, Main Reject Log , Script . **exicyclog** 가  
 , file . mainlog mainlog.01 , mainlog.01 mainlog.02 가 .  
 File . File Script . [\[1\]](#)  
 Log(mainlog.01) Disk .

[\[1\]](#) 10 .

## 14.5. Log File 가

Exim Perl Script 가 Main Log File 가 .  
 , 가 . 가

### 14.5.1. exigrep

**exigrep** Utility Log File .

```
exigrep 'H=orange\.csi\.example' /var/log/exim/mainlog
```

**H=orange.csi.example** Log , Entry 가  
 Message Log . Host Message Log

Message

Message

**exigrep** Mail , Host, Domain  
Script

```
exigrep [-l] <pattern> [<log file>] ...
```

-l flage "literal" Perl . Log File Text File ,  
File . **zcat** Utility Pipe .  
File , .

### 14.5.2. eximstats

Exim **eximstats** Perl Script . Script Exim Log File  
Exim ,  
Option . Option List  
Main Log File

```
eximstats -nr -ne /var/log/exim/mainlog
```

**eximstats** , Message Volume . Message Count  
Volume , 50 Host List .  
Message , 가 . Count, Error ,  
Message . **envelope**

[\[1\]](#)

[\[2\]](#) , **eximstats** Message

Message 가 , Error

Message

eximstats Volume, Message , Host  
eximstats , Message

```
Exim statistics from 2003-09-30 06:25:04 to 2003-10-01 06:23:02
```

```
Grand total summary
```

```
-----
```

```
At least one address
```

TOTAL	Volume	Messages	Hosts	Delayed	Failed
Received	204MB	1806	304	25 1.4%	152 8.4%
Delivered	347MB	3620	355		

Disable , Option Section .  
, Transport .

Deliveries by transport

```
-----
                Volume  Messages
**bypassed**                10MB          97
:blackhole:           15MB          282
local_delivery       140MB        2475
remote_smtp          187MB          604
```

Message 가 /dev/null , **\*\*bypassed\*\*** 가 . :blackhole Alias

File :blackhost: . -nt Option .

Message ,  
(dot) Message 가 Scale

Messages received per hour (each dot is 4 messages)

```
-----
00-01  30 .....
01-02  26 .....
02-03  19 ....
03-04  19 ....
04-05  21 .....
05-06  25 .....
06-07  39 .....
07-08  23 .....
08-09  14 ...
09-10  42 .....
10-11  95 .....
11-12  133 .....
12-13  63 .....
13-14  89 .....
14-15  121 .....
```

15-16	153	.....
16-17	220	.....
17-18	220	.....
18-19	160	.....
19-20	93	.....
20-21	113	.....
21-22	26	.....
22-23	33	.....
23-24	29	.....

Deliveries per hour (each dot is 14 deliveries)

-----

00-01	46	...
01-02	26	.
02-03	29	..
03-04	15	.
04-05	42	...
05-06	18	.
06-07	30	..
07-08	34	..
08-09	7	
09-10	51	...
10-11	199	.....
11-12	275	.....
12-13	96	.....
13-14	140	.....
14-15	374	.....
15-16	291	.....
16-17	712	.....
17-18	478	.....
18-19	291	.....
19-20	165	.....
20-21	183	.....
21-22	28	..
22-23	47	...
23-24	43	...

Option 가 , 1 . -h0 Option , : -h  
 30 . -h2 가

Section , Message 가 Queue . Message

Time spent on the queue: all messages

---

Under	1m	1775	98.3%	98.3%
	5m	11	0.6%	98.9%
	15m	2	0.1%	99.1%
	30m	3	0.2%	99.2%
	1h	1	0.1%	99.3%
	3h	10	0.6%	99.8%
	6h	1	0.1%	99.9%
	12h	1	0.1%	99.9%
	1d	1	0.1%	100.0%

Message 가 Queue

Time spent on the queue: messages with at least one remote delivery

---

Under	1m	247	92.2%	92.2%
	5m	8	3.0%	95.1%
	15m	2	0.7%	95.9%
	30m	3	1.1%	97.0%
	1h	1	0.4%	97.4%
	3h	6	2.2%	99.6%
	12h	1	0.4%	100.0%

-q0 Option Disable 가 . -q List 가  
 , (second) . 3 3\*60

-q 60,5\*60,10\*60

1 , 5 , 10 , 10 Queue Message

-nr Option , Section Local host Relay Message list 가

Relayed messages

-----

1 (aaa) [192.168.1.33] test01@example.com  
=> mail.test.example [192.168.2.11] webmaster@test.example  
...

Total: 532 (plus 0 unshown)

Relay	Relay	Message List	Relay Route	Host	IP	Message 가 Envelope Sender	Route
.	.	.	.	.	.	.	.
Relay	Relay	Message List	;	Message	Host		Host
.	.	.	.	.	.	.	.
Relay	Relay	.	.	.	.	.	, -nr Option
Relay	.	.	.	.	.	.	.

eximstats '-nr/busy\ .host\.name/' /var/spool/exim/log/mainlog.01

Option	Section	Relay	Line	Unshown Count
	Section	League Table	.	.

Top 50 sending hosts by message count

-----

267	6297274	localhost
191	1765892	hello.example
166	21540695	linux.example
112	11323801	bobby.example
86	438253	green.example
78	18013431	red.exampel
67	2759845	pink.example
44	751737	porche.example
44	581850	slash.example
36	2252575	cc.example
26	9353790	violet.example
26	6759010	(imelda.example)
21	39484	(murphy.example)

...

, Message Host List . Section Host List .

- Top 50 sending hosts by volume
- Top 50 local senders by message count; Local Host Message Local Part 가 List .
- Top 50 local senders by volume.
- Top 50 destinations by message count; Host List .
- Top 50 destinations by volume.
- Top 50 local destinations by message count; Local Part List .
- Top 50 local destinations by volume

-t Option 50 ; , -t10 Top 10 List . -t0

, ; -tnl , Local Sender

Section Error List .

#### List of errors

-----

1 1020@example1.com: unrouteable mail domain "example.com"

1 76bm13j5d@example02.com R=lookuphost T=remote\_smtp: SMTP  
 error from remote mailer after end of data: host mx.example02.com  
 [192.168.1.100]: 554 delivery error: dd This user doesn't  
 have a example02.com account (76bm13j5d@example.com) [0]  
 - mail.example02.com

...

Errors encountered: 335

-----

Error . -ne Option Disable .

[1] , RCPT 가 SMTP

[2] Message 가 가 .

## 14.6. Exim

Exim 가 . Exim Process  
 , Spool Directory Message File ,

### 14.6.1. exiqsumm

Exim 가 Message List . -bq  
 Option . exim -bp 가 ,  
**exiqsumm** Utility Scrip 가 .

```
exim -bp | exiqsumm
```

Count	Volume	Oldest	Newest	Domain
2	506KB	2h	76m	example.com
...				

Queue Message 가 example.com Domain .  
 506KByte ; Oldest 2 Queue 76 Queue .

### 14.6.2. exinext

Temporary Error 가 Message 가 , **exinext** Utility  
 . Utility Perl Exim Retry Database 가 . Mail Domain  
 가 , Utility Domain Host , Retry  
 Retry **exim\_dumpdb** . **exinext** .

```
$ exinext pcharley@bad.domain.com
mail1.bad.domain.com:192.168.1.4 error 146: Connection refused
first failed: 21-Feb-2003 14:57:34
last tried: 21-Feb-2003 14:57:34
next try at: 21-Feb-2003 15:02:34
mail2.bad.domain.com: 192.168.1.7 error 146: Connection refused
first failed: 20-Jan-2003 13:12:08
last tried: 21-Feb-2003 11:42:03
```



next try at: 21-Feb-2003 19:42:03

past final cutoff time

<b>past final cutoff time</b>	Error 가	Retry Rule		<b>.eximnext</b>
Domain	Local Part	.	Temporary Error 가	Retry
.	Message	Retry	Message ID	.
Message ID	Error	Host	Message 가	.

### 14.7. Exim Monitor

Exim Monitor X Application Exim Administrator **GUI**  
 Interface Message 가 ; Exim Monitor 가  
 가 , Exim Monitor Interface  
 , Exim Monitor Interface Fron end .

#### 14.7.1. Monitor

Monitor **eximon** Script . Script **eximon.bin** Binary  
 Window , Monitor . Exim  
 Built . Exim Compile , Compile  
**EXIMON\_**

```
EXIMON_LOG_DEPTH=400 eximon
```

Bourne Shell Shell LOG\_DEPTH .

**EXIMON\_LOG\_FILE\_PATH** 가 , Exim log file . **eximon**  
 Syslog Log Data 가 . syslog Data Log , Exim  
 monitor Log tail display . Syslog Message 가 Local Host Route Log Data  
 가 .

X resource window . Light  
 Gray eximon .

```
Eximon*background: gray94
```

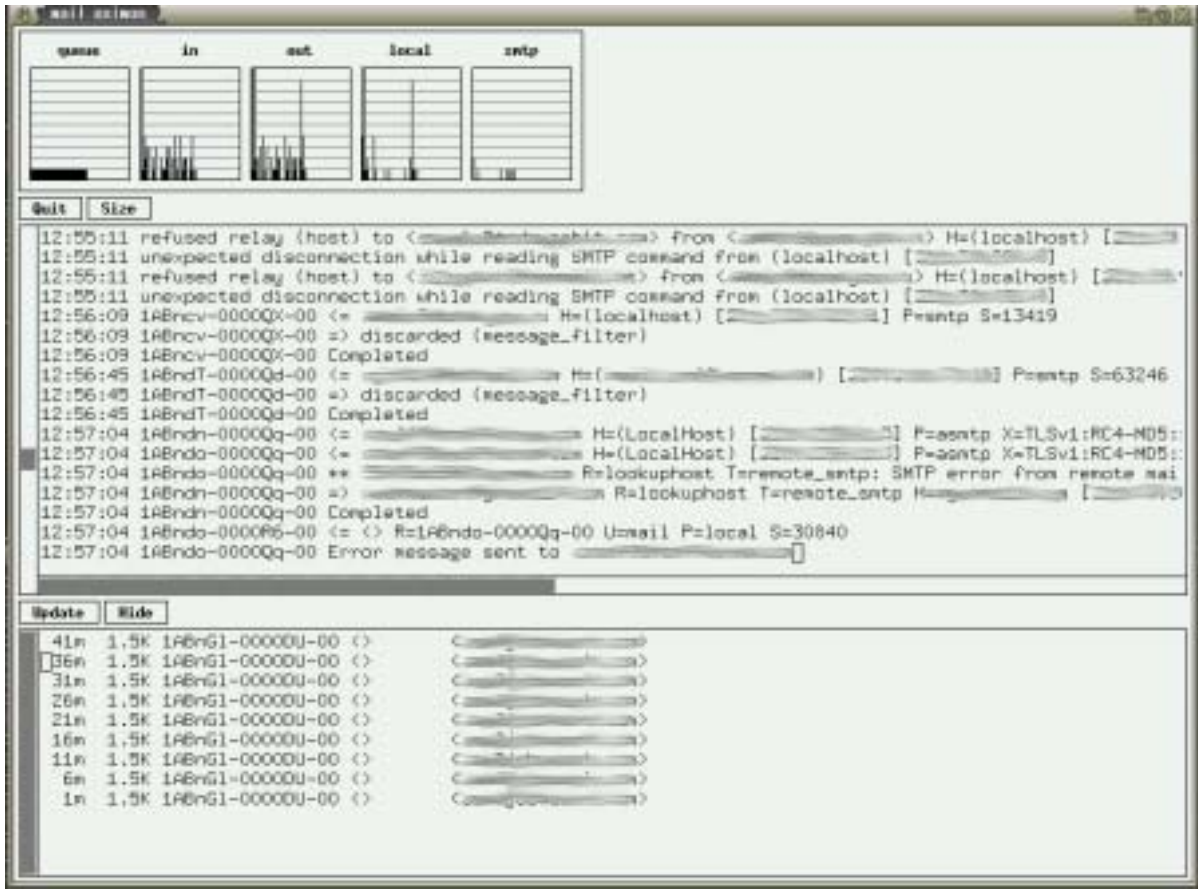
Stripchart Data Line Reference Line Black . Reference Line  
 . "highlight" Resource . X Server 가 Unix  
 , Resource Stripchart Reference Line 가 .

```
xrdb -merge <<END
Eximon*highlight: gray50
End
```

Spool Message, Eximon Administrator root

Monitor Window

### 14-1. Eximon



Stripchart

Main Log Data

Queue

Message

#### 14.7.2. Stripchart

Stripchart	Queue	Message	Script	Log File
Entry			Stripchart	가
	Message	Local	SMTP	Stripchart
Update	Stripchart	Display	Scale	Chart 10

Line . Title 10 가 . , x2  
2 .

Stripchart Disk Partition . Partition Local  
MailBox . Stripchar , Chart 100% , Scale  
x10% . 가 Stripchart Eximon 가 .

```
EXIMON_SIZE_STRIPCHART=/var/mail eximon
```

**/var/mail** Partition Monitor . Exim Source Build ,  
Build - time 가 . Chart 가 .  
EXIMON\_SIZE\_STRIPCHART\_NAME Stripchar 가 .

#### 14.7.3. Main Button

Stripchart Monitor Button . Button **Size** Button .  
Button Queue Count Stripchar Window . Size Button Toggle Button  
Button window 가 .

#### 14.7.4. Log Display

Window Main Log 가 . Log Data 가 Syslog  
Syslog Line EXIMON\_LOG\_FILE\_PATH Local File  
Route .

Log Window ScrollBar 가 .  
(上下) .

Log Window Log EXIMON\_LOG\_BUFFER Memory .  
가 , Log Data 50% . Log Window ScrollBar 가  
ScrollBar Log 가 . ScrollBar  
가 .

Log Window Log Data **CTRL-R** **CTRL-S** 가 . **CTRL-R** Reverse ,  
**CTRL-S** Forward . Log Window

#### 14.7.5. Queue Display

Monitor Window Queue Message [\[1\]](#) List . Window  
Update EXIMON\_QUEUE\_INTERVAL , 5 . Queue Scan

Queue Update , Queue Display Update Button  
 Host 가 , Mail Queue Message  
 , Hide Button . Hide Button , **Hide addresses ending**  
**with** Enter , Text text Chain 가 .  
 Message 가 text , Message Display .  
 가 text , Display . ,  
 , **foo.com.example** Domain , **xxx@foo.com.example**  
 . Hide 가 Display , Unhide Button 가 . Unhide  
 Hide . Message 가 1 Hide 가  
 .  
 가 Display , Button 가 .  
 Queue Message , Queue Display Message 가 Queue ,  
 Message , Message ID, Message Sender  
 . Queue Display Message 가 Error Message , Sender <> .  
 Message 가 가 , 가 Line  
 List . 가 가 Line (...) . Message  
 가 .  
 Queue Display Log Display 가 ScrollBar 가 가 .

#### 14.7.6. Queue Menu

Queue Window Message , Shift  
 가 Message Popup Menu 가 . 가  
 . **Shift + Mount Left Button** **CTRL + Mount Left Button**  
 가 .

```
EXIMON_MENU_EVENT='Ctrl<Btn1Down>' eximon
```

Popup Menu Title Message ID . Menu .

#### Message log

Message Message Log Window .

#### Headres

Envelope            Header                            Spool File                            Window                            .

**Body**

Message    Body                            Spool File                            Window                            .                            Data  
                          20KB                            .                            EXIMON\_BODY\_MAX                            가                            .

**Deliver message**

Message                            -M Option                            Exim                            . Message 가 Frozen                            ,  
                          . -v Option                            Exim                            Window                            .  
                          Exim Monitor 가 hold                            Process                            .

**Freeze message**

Message    Frozen                            -Mf Option                            Exim                            .

**Thaw message**

Frozen    Message                            -Mt Option                            Exim                            .

**Give up on msg**

                          Message                            -Mg Option                            Exim                            .  
Report 가                            .

**Remove message**

                          Error Report                            System                            Message                            -Mrm Option                            Exim

**Add recipient**

                          Dialog Box 가                            . Dialog Box                            Enter                            ,  
Dialog Box                            Message                            가                            -Mar Option                            Exim                            .  
Dialog Box 가                            .

**Mark Delivered**

                          Dialog Box 가                            . Dialog Box                            Enter                            ,  
Dialog Box                            -Mmd Option                            Exim                            .  
                          . Dialog Box 가                            .  
                          -Mmad Option                            Exim                            .

## Edit Sender

Sender Address Dialog Box 가 Sender Address  
 Enter , Sender Address Dialog Box Sender Address -  
 Mes Option Exim Dialog Box 가

## Edit Body

Message Body -Meb Option Exim , Message Body  
 Xterm Fork Body Line File  
 Queue Menu Exim Window  
**EXIMON\_ACTION\_OUTPUT=no** 가  
 Log  
 Queue Display Queue Display Freezing Thawing Update  
**EXIMON\_ACTION\_QUEUE\_UPDATE=no** Update 가  
 , Update Button Queue Display Update

[\[1\]](#)

Message, Message

## 14.8. Alias Datafile

Exim File , Data  
 File File , Exim 가 ;  
 Administrator 가 File , Exim Daemon  
 Procee **SIGHUP** Administrator root exim 가

```
kill -HUP `cat /var/run/exim.pid`
```

Daemon .Daemon  
 Log . Daemon Exim Process ,  
 Exim Process 가

## 14.9. DBM File

aliase                    Data                    DBM File                    , Data 가                    Source File                    Rebuild  
                                  . **exim\_dbmbuild**                    Program                    Source File                    DBM File                    .                    Program                    alias File  
                                  alias                    Data                                       DBM Database                    .  
                                  Zero                    Key String                    .                    **dbm** lookup type                    .  
                                  **exim\_dbmbuild** 가                    -nozero Option                    , Key String                    Data String                    Zero  
                                  File                    .                    **dbmz** lookup type                    DBM File

Program                    :                    File                    (                    Hyphen                    .)  
 Database                    .

                                 Key 가                    , Program                    .                    ,                    key                    Key                    ; **lsearch**  
 Lookup                    .                    -lastdup Option                                       Key                    Key 가                    .                    -nowarn  
 Option                                       Error                    Key                    .                    Key                    ,  
 1                    .                    -noduperr Option                                       Key                    0                    .                    Error  
                                  File                    , 2                    .

#### 14.10. Hints Database

Exim                    Hints Database                    Data                                       DBM File                    .                                       File  
                                  가                    .                    가                    ,                                       File                    가                    .                    File  
                                  가                                       가                    File                    가                    .  
                                  ,                                                                                                Site  
 Hint Database                    .                    **exim\_tidydb** Utility Program                    .  
 Hints database                    Dump                                       Utility                    .                                       Administrator  
                                  Program                                                                                                Program                    .  
**exim\_tidydb** Utility Program                                                          Exim                    Spool Directory  
                                  **exim\_tidydb** 가                    Database                    .                    Database

#### retry

가 Database

#### reject

Reject Message 가 Database

### wait-transport-name

Host, Transport Message 가 Database.  
 Remote Transport 가 wait-remote\_smtp  
 Database .

### serialize-transport-name

, Transport , 가  
 Database.

### serialize-etrn-runs

smtp\_etrn\_serialize 가 , ETRN Queue Run 가  
 Database.

exim\_tidydb 가 Option , Database 30  
 가 .

```
exim_tidydb /var/spool/exim retry
```

-t Option Cutoff date 가 . Retry Database  
 가 .

```
exim_tidydb -t 7d /var/spool/exim retry
```

Hint Database Message Data . -f Option 가  
 . Option Database Record Message ID 가 Queue Message  
 Message Hints .

exim\_tidydb Utility Database . exim\_tidydb  
 Database . Database Lock  
 . exim .

, Host ETRN serialization remote\_smtp Remote Transport  
 , .

```
exim_tidydb -f /var/spool/exim retry >/dev/null
exim_tidydb -f /var/spool/exim reject >/dev/null
exim_tidydb -f /var/spool/exim wait-remote_smtp >/dev/null
```



(/usr/local/bin/tidy\_alldb 가 ) root crontab  
. [11]

```
10 3 * * * su exim -c /usr/local/bin/tidy_alldb
```

[11] Debian GNU/LINUX /etc/cron.daily/exim exim\_tidydb .

### 14.11. Mailbox

Mailbox Message Mailbox Message ,  
가 . Message .  
가 Mailbox Lock  
. [11]

**exim\_lock** Utility Exim Algorithm Mailbox Lock . Exim  
Agent MailBox 가 Utility File .  
Lock , 가 가  
, **SHELL** ; 가 /bin/sh 가 ,  
Mailbox unlock Utility .

```
exim_lock /var/mail/pcharley
```

가 File Lock Shell .

```
exim_lock -q /var/mail/pcharley <<End  
some commands  
End
```

File Lock . -q Option Utility  
Message .

```
exim_lock -q /var/mail/pcharley "cp /var/spool/mail/pcharley /some/where"
```

-q Option , 가 Locking Process -v Option  
가 . **appendfile** Transport Mailbox Locking Option  
가 Option . **appendfile** Locking Option , Option 가 .

-fcntl

Mailbox **fcntl()** locking .

**-interval**

, 3 .

**-lockfile**

Mailbox Lock File .

**-mbx**

MBX rule Mailbox Lock .

**-retries**

retry . 10 .

**-timeout**

**fcntl()** locking Timeout .

-fcntl, -lockfile -mbx , Lockfile , Exim

Mailbox **fcntl()** locking . -fcntl 가 ; -lockfile

가 File Directory . Lock File Locking Lock

. Exim Lock file 30 가 . -mbx Option -fcntl

[\[11\]](#) Mailbox 가 Lock 가 , Mailbox

15 .

exim 가  
 2 가 , 가  
 1 Debian GNU/LINUX sid sarge  
 Exim4 가 Debian Package Exim3 가  
 Exim 3.3 Sarge 가 MTA  
 (^) exim4 ACL  
 . [\[1\]](#)  
 exim4

2004 1 8

[\[1\]](#) Exim . Exim 3.3 Message  
 All and Nothing 가 ACL 가 가  
 Exim 3.3 Filter  
 ACL 가 가

## A.

A.1. [exim.conf](#)

A.2. [remove.filter](#)

## A.1. exim.conf

/etc/exim/exim.conf

```
#####
#           MAIN CONFIGURATION SETTINGS           #
#####

qualify_domain = pcharley.net

# DBM      FILE
local_domains = localhost : pcharley.net : dbm;/etc/exim/virtual_dbm
local_domains_include_host = true
local_domains_include_host_literals = true
never_users = root

#      remote host      .      Option
#      가      .

host_lookup = *

#
host_accept_relay = 127.0.0.1 : :::1

#
host_auth_accept_relay = *
percent_hack_domains = *
trusted_users = mail
smtp_verify = true
gecos_pattern = ^([^,]*)
gecos_name = $1
freeze_tell_mailmaster = true
received_header_text = "Received: \
    ${if def:sender_rcvhost {from ${sender_rcvhost}\n\t}\
    ${if def:sender_ident {from ${sender_ident} }}\
    ${if def:sender_helo_name {(helo=${sender_helo_name})\n\t}}}\
    by ${primary_hostname} \
    ${if def:received_protocol {with ${received_protocol}}}\
    ${if def:tls_cipher {\n\t(Cipher ${tls_cipher}) }}\
    ${if def:tls_peerdn {(PeerDN ${tls_peerdn}) }}\
    (Exim ${version_number} #${compile_number} (Debian))\n\t"
```

```

    id ${message_id}\
    ${if def:received_for {\n\tfor <${received_for}>}}"

#                                     tls
auth_over_tls_hosts = *
tls_advertise_hosts = *

# exim-tls
tls_certificate = /etc/exim/exim.crt
tls_privatekey = /etc/exim/exim.key
tls_log_cipher = true
tls_log_peerdn = true

# Spool
split_spool_directory = true

#           가 10           incoming mail   queue
queue_only_load = 10

#           가 20           deliver
deliver_queue_load_max = 20

#           200M
check_spool_space = 200M

# remote           200
# 421 Too many concurrent SMTP connections; please try again later.
smtp_accept_max = 300

#           remote host           100
# 421 Too many concurrent SMTP connections from one IP address; please try again later.
smtp_accept_max_per_host = 100

# remote incoming
#           incoming           .           가           .
smtp_accept_max           가           .
smtp_accept_queue = 200

# remote           incoming

```

```

# incoming ( )
# 가
# exim
smtp_accept_queue_per_connection = 100

# incoming mail
message_size_limit = 10M

# sender 가 header reply-to, From 가
#
sender_verify_fixup

#
headers_check_syntax = true

# (DNS lookup )
sender_verify = true

# Incoming SMTP header Sender:, Reply-To:, or From:
headers_sender_verify = true

#
# sender_verify, headers_sender_verify
sender_verify_hosts = ! 192.168.1.0/24

#
smtp_banner = "${primary_hostname} Secure SMTP Server Ready.."

# frozen
ignore_errmsg_errors = true

#
message_filter = /etc/exim/remove.filter

### mailman ###
# home dir for mailman
MAILMAN_HOME=/var/lib/mailman
# wrapper script for mailman
MAILMAN_WRAP=MAILMAN_HOME/mail/wrapper

```

```

# user and group for mailman
MAILMAN_UID=list
MAILMAN_GID=daemon

end

#####
#                TRANSPORTS CONFIGURATION                #
#####
#                ORDER DOES NOT MATTER                    #
#    Only one appropriate transport is called for each delivery.  #
#####

local_delivery:
    driver = appendfile
    group = mail
    mode = 0660
    mode_fail_narrower = false
    envelope_to_add = true
    return_path_add = true
    file = /var/spool/mail/${local_part}
    #   가          ....:)
    headers_add = "\
        X-Organization: Debian GNU/Linux Network World\n\
        X-pcharley-say: Faith be to human being forever and ever..."
    # appendfile transport                quota
    # quota                                가
    quota_is_inclusive = false
    quota = 100M
    quota_warn_threshold = 95%
    # quota                                error message
    quota_warn_message = "\
        To: $local_part@$domain\n\
        Subject: Your mailbox exceed!!!\n\
        This message is automatically created by mail delivery software.\n\n\
        The size of your mailbox has exceeded a warning threshold that is\n\
        set by the system administrator.\n"

```

```

address_pipe:
    driver = pipe
    path = /usr/bin:/bin:/usr/local/bin
    return_output

address_file:
    driver = appendfile
    envelope_to_add = true
    return_path_add = true

address_directory:
    driver = appendfile
    no_from_hack
    prefix = ""
    suffix = ""
# maildir_format

address_reply:
    driver = autoreply

procmail_pipe:
    driver = pipe
    command = "/usr/bin/procmail"
    return_path_add
    delivery_date_add
    envelope_to_add
# check_string = "From "
# escape_string = ">From "
    suffix = ""

remote_smtp:
    driver = smtp
# authenticate_hosts = smarthost.isp.com
#   가      ....:)
    headers_add = "\
        X-Organization: Debian GNU/Linux Network World\n\
        X-pcharley-say: Faith be to human being forever and ever..."

### mailman ###

```



```

list_transport:
    driver = pipe
    command = MAILMAN_WRAP post ${lc:$local_part}
    current_directory = MAILMAN_HOME
    home_directory = MAILMAN_HOME
    user = MAILMAN_UID
    group = MAILMAN_GID

list_request_transport:
    driver = pipe
    command = MAILMAN_WRAP mailcmd ${lc:$local_part}
    current_directory = MAILMAN_HOME
    home_directory = MAILMAN_HOME
    user = MAILMAN_UID
    group = MAILMAN_GID

list_admin_transport:
    driver = pipe
    command = MAILMAN_WRAP mailowner ${lc:$local_part}
    current_directory = MAILMAN_HOME
    home_directory = MAILMAN_HOME
    user = MAILMAN_UID
    group = MAILMAN_GID

```

end

```

#####
#                DIRECTORS CONFIGURATION                #
#                Specifies how local addresses are handled        #
#####
#                ORDER DOES MATTER                #
#  A local address is passed to each in turn until it is accepted.  #
#####

```

```

real_local:
    prefix = real-
    driver = localuser
    transport = local_delivery

```

```
virtuals:
    driver = aliasfile
    domains = dbm;/etc/exim/virtual_dbm
    file = /etc/exim/exim_virtual/$domain.aliases
    search_type = lsearch
    no_more

system_aliases:
    driver = aliasfile
    file_transport = address_file
    pipe_transport = address_pipe
    file = /etc/aliases
    search_type = lsearch
# user = list
# Uncomment the above line if you are running smartlist

userforward:
    driver = forwardfile
    file_transport = address_file
    pipe_transport = address_pipe
    reply_transport = address_reply
    no_verify
    check_ancestor
    check_local_user
    file = .forward
    modemask = 002
    filter

procmail:
    driver = localuser
    transport = procmail_pipe
    require_files = ${local_part}:+${home}:+${home}/.procmailrc:+usr/bin/procmail
    no_verify

localuser:
    driver = localuser
    transport = local_delivery
```

```

### mailman ###

list_owner_director:
    driver = smartuser
    require_files = MAILMAN_HOME/lists/${lc:$local_part}/config.db
    suffix = "-owner"
    new_address = "${lc:$local_part}-admin@${domain}"

owner_list_director:
    driver = smartuser
    require_files = MAILMAN_HOME/lists/${lc:$local_part}/config.db
    prefix = "owner-"
    new_address = "${lc:$local_part}-admin@${domain}"

##
## Next 3 directors direct admin, request and list mail to the appropriate
## transport. List existence is checked as above.

list_admin_director:
    driver = smartuser
    suffix = -admin
    require_files = MAILMAN_HOME/lists/${lc:$local_part}/config.db
    transport = list_admin_transport

list_request_director:
    driver = smartuser
    suffix = -request
    require_files = MAILMAN_HOME/lists/${lc:$local_part}/config.db
    transport = list_request_transport

list_director:
    driver = smartuser
    require_files = MAILMAN_HOME/lists/${lc:$local_part}/config.db
    transport = list_transport

end

#####

```

```

#                ROUTERS CONFIGURATION                #
#                Specifies how remote addresses are handled        #
#####
#                ORDER DOES MATTER                #
# A remote address is passed to each in turn until it is accepted. #
#####

lookuphost:
  driver = lookuphost
  transport = remote_smtp

literal:
  driver = ipliteral
  transport = remote_smtp

end

#####
#                RETRY CONFIGURATION                #
#####

*                *                F,2h,15m; G,16h,2h,1.5; F,4d,8h

end

#####
#                REWRITE CONFIGURATION                #
#####

*@pcharley.net    ${lookup{$1}|search{/etc/email-addresses}\
                                {$value}fail} frFs

end

#####
#                AUTHENTICATION CONFIGURATION                #
#####

```

```

# PAM
plain:
    driver = plaintext
    public_name = PLAIN
    server_condition = "${if pam{$2:$3}{yes}{no}}"
    server_set_id = $2

login:
    driver = plaintext
    public_name = LOGIN
    server_prompts = "Username:: : Password::"
    server_condition = "${if pam{$1:$2}{1}{0}}"
    server_set_id = $1

end

```

## A.2. remove.filter

### /etc/exim/remove.filter

```

# Exim filter

#
# exim Router, Director Driver 가
#
if not first_delivery
then
    finish
endif

# 192.168.1.22 IP 가
# Sender Host MX
if $sender_helo_name contains "mail.pcharley.net" and $sender_fullhost does not match
"(192\.168\.1\.22|127\.0\.0\.1)"
then
    logfile /var/log/exim/filter.log
    logwrite "$tod_log $message_id virus(MX) detected in mail from host
$sender_host_name[$sender_host_address]"

```

```

    seen finish
endif

# Sender      pcharley.net
if $header_from: contains "@pcharley.net"
    and $sender_fullhost does not match "(192\.168\.1\.[1-126]|127\.0\.0\.1)"
    and $received_protocol does not match "(asmtpl|local)"
then
    logfile /var/log/exim/filter.log
    logwrite "$tod_log $message_id virus(Sender) detected in mail from host
$sender_host_name[$sender_host_address]"
    seen finish
endif

#           Sender
if $header_from: contains "support@microsoft.com"
    or $header_from: contains "security@microsoft.com"
    or $header_from: contains "@test.com"
    or $header_from: contains "@boss.com"
    or $header_from: contains "@webchore.net"
    or $header_from: contains "@test1.com"
then
    logfile /var/log/exim/filter.log
    logwrite "$tod_log $message_id virus(Bad domain) detected in mail from host
$sender_host_name[$sender_host_address]"
    seen finish
endif

# sobig.f filtering
if $message_body contains "A4fug4AtAnNlbgBTMOhVGhpcyBwcm9ncmFtIGNhbm5vdCBiZSBydW4ga"
    and $header_subject: matches "(^[Rr]e: [Yy]our
[Aa]pplication\\$|^[Rr]e: )?([Rr]e:|[Rr]e:[Mm]y|[Yy]our) [Dd]etails\\$|^[Rr]e: )?[Tt]hank
[Yy]ou!\\$|^[Rr]e: [Tt]hat [Mm]ovie\\$|^[Rr]e: [Ww]icked [Ss]creensaver\\$|^[Rr]e: [Aa]pproved\\$)"
then
    logfile /var/log/exim/sobig.f.log
    logwrite "$tod_log $message_id Sobig F worm(Body & Subject) detected in mail from host
$sender_host_name[$sender_host_address]"
    seen finish
endif

```

```

if $header_subject: contains "Re: Your Application"
  or $header_subject: contains "Re: My Details"
  or $header_subject: contains "Re: Your Details"
  or $header_subject: contains "Re: That movie"
  or $header_subject: contains "Re: Wicked screensaver"
  or $header_subject: contains "Re: Details"
  or $header_subject: contains "Re: Thank you!"
  or $header_subject: contains "Thank you!"
  or $header_subject: contains "Re: Approved"
then
  logfile /var/log/exim/sobig.f.log
  logwrite "$tod_log $message_id Sobig F worm(Subject) detected in mail from host
$sender_host_name[$sender_host_address]"
  seen finish
endif

# Mailing list
# Mailing list
if $header_to: contains "list@pcharley.net" and error_message
then
  logfile /var/log/exim/mailling.filter.log
  logwrite "$tod_log $message_id alliance Mailing filter(error_message) detected in mail from host
$sender_host_name[$sender_host_address]"
  seen finish
endif

```

## B. ,

B.1. \_\_\_\_\_

B.2. \_\_\_\_\_

B.1.

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가

0 . (前文)

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2 (二次構成部, secondary section)

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가 (變更不可部分, invariant section) 가 가

, 가

2

(表紙句節, cover texts) 가 가

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, ( )

가 . 가

(不透明, opaque)

ASCII

Texinfo , LaTeX ,

DTD

SGML XML,

HTML

PostScript PDF,

DTD 가 SGML XML ,

HTML .

(title page)

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가 가 가 가

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