# hose

# Name

hose — Control all manner of rubberhoses

A command within the Marutukku encryption system

# **Synopsis**

hose [global-options] {command} [local-options] [args...]

# **GLOBAL OPTIONS**

```
    Disable wait for entropy (useful for batch tests)
    f
    Force through errors where possible
    L
    Disable memory locking
    -q
    Quiet
    Quick and quiet, enable -d0, -ELQTW and -P0 options
```

-T

Disable reseting file time stamps to epoch

-W

Disable memory wiping (useful for batch tests)

-d level

Set debug level to 'level'

-P level

Set self-psychoanalysis rigour to 'level'

# **COMMANDS**

# aspectinfo

Dump informative info about aspect

#### attachextent

Attach extent

# bindaspect

Binds aspect to device

#### changepass

Change keying for aspect

# decryptaspect

Decrypt from Aspect to output

# decryptfile

Conventional file decryption

#### dekeyaspect

Dekey aspect

#### detachextent

Detach previously attached extent

### encryptaspect

Encrypt from input to Aspect

#### encryptfile

Conventional file encryption

# example

Show example usage for command

#### help

General help or help on a particular command

#### info

Display configuration

# keyaspect

Key aspect (needs an attached extent)

#### list

List available ciphers, commands or remaps

#### newaspect

Create new aspect for keymap

#### newextent

Create new extent

### newkeymap

Create new keymap file

# psycho

Visit the psychiatrist

### remapinfo

Dump remap information

# speeds

Test cipher speeds

# sync

Sync hose daemon pending writes to disk

#### terminate

Terminate hose daemon

# unbindaspect

Unbind aspect from device

# wipe

Wipe file or extent

# **COMMAND DESCRIPTIONS**

# aspectinfo

```
aspectinfo [-a aspect] [keymap]
-a aspect
   Use aspect number 'aspect'

Dump informative info about aspect
```

#### **EXAMPLE**

#### Example 1. Example aspectinfo

\$ hose aspectinfo -a 0 maru.keymap

```
Agitating master key with cast-
cbc key generator over 123562 iterations...
Aspect 1 passphrase ("." to end):
Aspect 2 passphrase ("." to end):
Aspect 3 passphrase ("." to end):
Aspect 4 passphrase ("." to end):
Aspect 5 passphrase ("." to end):
Aspect 0:

Lattice Cipher: cast-cbc
Block Cipher: idea-cbc
Start:
0
Blocks:
64
```

# attachextent

```
attachextent [-B] [-a aspect] [-R path] [keymap [extent [device]]]

-B

Disable pro-active block reallocation (bmap)

-a aspect

Use aspect number 'aspect'

-R path

Rendezvous with hosed AF_UNIX socket at 'path'

Attach extent
```

# **EXAMPLE**

# **Example 2. Example attachextent**

\$ hose attachextent -a 0 -R /tmp/rendezvous

# bindaspect

```
bindaspect [-R] [-a aspect]

-R path
    Rendezvous with hosed AF_UNIX socket at 'path'
```

```
-a aspect
```

Use aspect number 'aspect'

Binds aspect to device

# **EXAMPLE**

### **Example 3. Example bindaspect**

\$ hose bindaspect -a 0 -R /tmp/rendezvous

# changepass

```
changepass [-a aspect] [keymap]
```

-a aspect

Use aspect number 'aspect'

Change keying for aspect

# **EXAMPLE**

# **Example 4. Example changepass**

\$ hose changepass -a 0 maru.keymap

# decryptaspect

```
decryptaspect [-a aspect] [-o file] [-s blocks] [keymap [extent
[output]]]

-a aspect
   Use aspect number 'aspect'

-o file
   Output operation to 'file'

-s blocks
   Size in 'blocks'
Decrypt from Aspect to output
```

# **EXAMPLE**

#### Example 5. Example decryptaspect

\$ hose decryptaspect -a 0 -o maru.out

```
Agitating master key with cast-
cbc key generator over 123562 iterations...

Aspect 1 passphrase ("." to end):
Aspect 2 passphrase ("." to end):
Aspect 3 passphrase ("." to end):
Aspect 4 passphrase ("." to end):
Aspect 5 passphrase ("." to end):
decrypted 64 blocks from maru.extent to maru.out
```

# decryptfile

```
decryptfile [-3 cipher] [-i file] [-0 file] [-V iv] [input [output]]

-3 cipher
    Cipher for block encryption/decryption

-i file
    Take input from 'file'

-0 file
    Output operation to 'file'

-V iv
    Use 'iv' (in hex) as the initialisation vector
Conventional file decryption
```

# **EXAMPLE**

# **Example 6. Example decryptfile**

\$ hose decryptfile -3 idea-cbc -i maru.ciphertext V 0xadeadfedbabecafe -o maru.out

Passphrase:

# dekeyaspect

```
dekeyaspect [-a aspect] [-R path]

-a aspect
    Use aspect number 'aspect'

-R path
    Rendezvous with hosed AF_UNIX socket at 'path'

Dekey aspect
```

# **EXAMPLE**

# Example 7. Example dekeyaspect

\$ hose dekeyaspect -a 0 -R /tmp/rendezvous

### detachextent

```
detachextent [-R path]

-R path

Rendezvous with hosed AF_UNIX socket at 'path'

Detach previously attached extent
```

### **Example 8. Example detachextent**

\$ hose detachextent -R /tmp/rendezvous

# encryptaspect

```
encryptaspect [-B][-a aspect][-i file][-s blocks][keymap [extent
[input]]]

-B
    Disable pro-active block reallocation (bmap)
```

- -a aspect
  Use aspect number 'aspect'
- -i file

  Take input from 'file'
- -s blocks
  Size in 'blocks'

Encrypt from input to Aspect

#### Example 9. Example encryptaspect

\$ hose encryptaspect -a 0 -i maru.plaintext maru.keymap

```
Agitating master key with cast-
cbc key generator over 123562 iterations...

Aspect 1 passphrase ("." to end):
Aspect 2 passphrase ("." to end):
Aspect 3 passphrase ("." to end):
Aspect 4 passphrase ("." to end):
Aspect 5 passphrase ("." to end):
encrypted 32 blocks from maru.plaintext to maru.extent
```

# encryptfile

```
encryptfile [-3 cipher] [-i file] [-0 file] [-V iv] [input [output]]

-3 cipher
    Cipher for block encryption/decryption

-i file
    Take input from 'file'

-0 file
    Output operation to 'file'

-V iv
    Use 'iv' (in hex) as the initialisation vector
```

Conventional file encryption

# **EXAMPLE**

# Example 10. Example encryptfile

\$ hose encryptfile -3 idea-cbc -i maru.plaintext o maru.ciphertext

Passphrase:

# example

**example** [-m] [command]

-m

Minimal output

Show example usage for command

### **EXAMPLE**

### Example 11. Example example

\$ hose example newaspect

Example:

```
../hose/hose newaspect -2 cast-cbc -3 idea-cbc -a 0 - s 64 -t 1 maru.keymap
```

# help

```
help [-S] [commands | options | command]
```

-S

SGML output

General help or help on a particular command

#### **EXAMPLE**

#### Example 12. Example help

\$ hose help newkeymap

```
Usage: ../hose/hose [-EfLqQTW] [-d level] [-
P level] newkeymap [-1 cipher] [-A aspects] [-b bytes] [-
c blocks] [-D depth] [-r remap] [-s blocks] [keymap]
Description:
        Create new keymap file
Local options:
1 cipher
                   Cipher for encryption/decryption of keys
                           Max number of usable aspects
        -A aspects
        -b bytes
                            Block size in bytes
        -c blocks
                            Largest aspect size in blocks
        -D depth
                           Depth of block key lattice
        -r remap
                           Use remap type 'remap'
```

```
-s blocks
                             Size in 'blocks'
Global options:
        -\mathbf{E}
                             Disable wait for entropy (use-
ful for batch tests)
        -f
                             Force through errors where possible
        -L
                             Disable memory locking
                             Quiet
        -q
                             Quick and quiet, enable -d0, -
        -0
ELQTW and -P0 options
Т
                   Disable reseting file time stamps to epoch
                             Disable memory wiping (use-
ful for batch tests)
        -d level
                             Set debug level to 'level'
        -P level
                             Set self-
psychoanalysis rigour to 'level'
Example:
        ../hose/hose newkeymap -1 cast-cbc -A 6 -b 8192 -c 32 -
r bmap -s 128 maru.keymap
```

#### info

info [-1 seconds][-I seconds][-x msec][keymap [extent [device]]]

-I seconds

Autodetach after 'seconds' of idleness

-1 seconds

Autodetach after 'seconds' since attach

-x msec

Use 'msec' miliseconds between cipher state xors

Display configuration

#### **EXAMPLE**

#### Example 13. Example info

#### \$ hose info maru.keymap

Major Version: 2 Minor Version: 1

Key Cipher:

name cast-cbc
 cipher\_num 1

key\_size 128 bits block\_size 64 bits state/ksch 132 bytes

Key Iterations: 123562
Blocks: 128
Block Size: 8192

Lattice Depth: 32 (4194304k addressable bytes)

Aspects: 6
Remap Type: bmap

Checksum: 0xabf0bfb5
Maru device: /dev/maru0
Maru extents: maru.extent
Maru IV/SALT: maru.keymap
Life time: 28800 (seconds)
Idle time: 1800 (seconds)
XOR cycle: 500 (mili seconds)

# keyaspect

```
keyaspect [-R][-a aspect]

-R path
    Rendezvous with hosed AF_UNIX socket at 'path'
-a aspect
    Use aspect number 'aspect'

Key aspect (needs an attached extent)
```

# **EXAMPLE**

# Example 14. Example keyaspect

\$ hose keyaspect -a 0 -R /tmp/rendezvous

#### list

```
list [-m] [ciphers | commands | remaps]
```

-m

Minimal output

List available ciphers, commands or remaps

#### Example 15. Example list

#### \$ hose list ciphers

```
name xor
  cipher_num
                16
                256 bits
  key_size
  block_size
                0 bits (stream cipher)
  state/ksch
                4 bytes
name bcopy
  cipher_num
                17
                256 bits
  key_size
  block size
                0 bits (stream cipher)
  state/ksch
                4 bytes
name idea-cbc
  cipher_num
                2
  key_size
                128 bits
  block_size
                64 bits
  state/ksch
                432 bytes
name cast-cbc
  cipher_num
                1
                128 bits
  key_size
                64 bits
  block_size
  state/ksch
                132 bytes
name ssl-blowfish-cbc
  cipher_num
  key_size
                448 bits
  block size
                64 bits
  state/ksch
                8196 bytes
name ssl-rc2-cbc
  cipher_num
                12
  key_size
                128 bits
  block_size
                64 bits
  state/ksch
                8196 bytes
name ssl-rc4
```

```
cipher_num
                13
  key_size
                256 bits
  block_size
                0 bits (stream cipher)
  state/ksch
                8196 bytes
name ssl-rc5-cbc
  cipher_num
                15
                128 bits
  key_size
  block_size
                64 bits
  state/ksch
                8196 bytes
name ssl-idea-cbc
  cipher_num
                11
  key_size
                128 bits
                64 bits
  block_size
  state/ksch
                8196 bytes
name ssl-des-cbc
  cipher_num
  key_size
                64 bits (56 bits real)
                64 bits
  block_size
  state/ksch
                8196 bytes
name ssl-des-ede-cbc
  cipher_num
  key_size
                128 bits (112 bits real)
  block_size
                64 bits
  state/ksch
                8196 bytes
name ssl-des-ede3-cbc
  cipher_num
  key_size
                192 bits (168 bits real)
  block size
                64 bits
  state/ksch
                8196 bytes
name ssl-desx-cbc
  cipher_num
  key_size
                192 bits (168 bits real)
  block_size
                64 bits
  state/ksch
                8196 bytes
name ssl-cast-cbc
  cipher_num
                14
  key_size
                128 bits
```

block\_size 64 bits
state/ksch 8196 bytes
name rc16
cipher\_num 4
key\_size 256 bits
block\_size 0 bits (stream cipher)
state/ksch 131080 bytes

### newaspect

newaspect [-2 cipher] [-3 cipher] [-a aspect] [-0 block] [-s blocks] [-t
time] [keymap]

-2 cipher

Cipher for generation of block keys

-3 cipher

Cipher for block encryption/decryption

-a aspect

Use aspect number 'aspect'

-O block

Start block range at offset 'block'

-s blocks

Size in 'blocks'

-t time

Use 'time' seconds of key cycle agitation

Create new aspect for keymap

#### **EXAMPLE**

#### Example 16. Example newaspect

\$ hose newaspect -2 cast-cbc -3 idea-cbc -a 0 -s 64 t 1 maru.keymap

Generating 11128 pseudo-

cryptographically random bytes for aspect 0 erasure

cryptographically random bytes for aspect 0 cycle .....

Generating 32 cryptographically random bytes for aspect 0 master key

.....

Generating 32 cryptographically random bytes for aspect 0 info  $\ensuremath{\mathsf{key}}$ 

.....

Generating 32 cryptographically random bytes for aspect 0 remap master key  $\,$ 

.....

Generating 104 pseudo-cryptographically random bytes for cycle salt

.....

Agitating cast-cbc key generator state for 1 second...

123562 cast-cbc agitations (123562 per second)

Generating 4 pseudocryptographically random bytes for aspect information salt

#### newextent

Create new extent

```
newextent [-1 cipher][-w rounds][-s blocks][-b bytes][keymap]
[extent]

-1 cipher
    Cipher for encryption/decryption of keys

-b bytes
    Block size in bytes

-s blocks
    Size in 'blocks'

-w rounds
    Apply 'rounds' worth of wiping
```

#### Example 17. Example newextent

\$ hose newextent -1 cast-cbc -w 0 -s 128 -b 8192

```
hose: Warning: creating extent using Unix file holes. Such extents are *not* crypto-deniable.

Extent creation complete (1048576 bytes)
```

# newkeymap

```
newkeymap [-1 cipher][-A aspects][-b bytes][-c blocks][-D depth]
[-r remap][-s blocks][keymap]
```

-1 cipher

Cipher for encryption/decryption of keys

-A aspects

Max number of usable aspects

-b bytes

Block size in bytes

-c blocks

Largest aspect size in blocks

-D depth

Depth of block key lattice

```
-r remap
    Use remap type 'remap'
-s blocks
    Size in 'blocks'
Create new keymap file
```

#### Example 18. Example newkeymap

hose newkeymap -1 cast-cbc -A 6 -b 8192 -c 32 -r bmap -

# psycho

#### psycho

Visit the psychiatrist

#### Example 19. Example psycho

#### \$ hose -d 9 -P 9 psycho

```
hose: psychoanalysis: checking that all command op-
tions have help...
hose: psychoanalysis: checking that all options have com-
mands that use them...
hose: psychoanalysis: sizeof (m_u64) == 8... passed
hose: psychoanalysis: sizeof (m u32) == 4... passed
hose: psychoanalysis: sizeof (m_u16) == 2... passed
hose: psychoanalysis: sizeof (m_u8) == 1... passed
hose: psychoanalysis: sizeof (int) >= 4... passed
hose: psychoanalysis: hton8(0x12) == 0x12... passed
hose: psychoanalysis: hton16(0x1234) == 0x3412... passed
hose: psychoanalysis: hton32(0x12345678) == 0x78563412... passed
hose: psychoanaly-
sis: hton64(0x1122334455667788) == 0x8877665544332211... passed
hose: psychoanalysis: MAX PASSPHRASE >= MIN PASSPHRASE... passed
hose: psychoanalysis: MAX_IV == MAX_CIPHER_BLOCK... passed
hose: psychoanalysis: MAX_CIPHER_BLOCK == 8... passed
hose: psychoanalysis: sizeof (maru-
Pass) == MAX PASSPHRASE... passed
hose: psychoanalysis: sizeof (maruKey) == MAX_KEY... passed
hose: psychoanalysis: sizeof (maruIV) == MAX IV... passed
hose: psychoanaly-
sis: sizeof (maruBlock) == MAX_CIPHER_BLOCK... passed
hose: psychoanalysis: blockAligned(maruCycle)... passed
hose: psychoanalysis: blockAligned(maruAspectInfo)... passed
hose: psychoanalysis: examining "/home/proff"... passed
hose: psychoanalysis: examining "/etc/mtab"... passed
hose: psychoanalysis: xor auto test vec-
tor in == out, ply = 1... passed
hose: psychoanalysis: xor auto test vec-
tor in != out, ply = 1... passed
```

```
hose: psychoanalysis: bcopy auto test vec-
tor in == out, ply = 1... passed
hose: psychoanalysis: bcopy auto test vec-
tor in != out, ply = 1... passed
hose: psychoanalysis: idea-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: idea-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: cast-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: cast-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-blowfish-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-blowfish-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-rc2-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-rc2-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-
rc4 auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-
rc4 auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-rc5-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-rc5-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-idea-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-idea-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-des-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-des-
cbc auto test vector in != out, ply = 1... passed
```

```
hose: psychoanalysis: ssl-des-ede-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-des-ede-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-des-ede3-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-des-ede3-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-desx-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-desx-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: ssl-cast-
cbc auto test vector in == out, ply = 1... passed
hose: psychoanalysis: ssl-cast-
cbc auto test vector in != out, ply = 1... passed
hose: psychoanalysis: rc16 auto test vec-
tor in == out, ply = 1... passed
hose: psychoanalysis: rc16 auto test vec-
tor in != out, ply = 1... passed
Passed the maru DSM, level 9
```

# remapinfo

remapinfo [keymap]

Dump remap information

#### Example 20. Example remapinfo

\$ hose remapinfo maru.keymap

# speeds

```
speeds [-eS][-a aspect][keymap [extent]]

-e
    Use entire maru encryption path for speed calculations
-S
    SGML output
-a aspect
    Use aspect number 'aspect'
```

Test cipher speeds

# **EXAMPLE**

# Example 21. Example speeds

# \$ hose speeds

_	setkey/s   512k/s   1024k/s   2048k/s   4096k/s   8192k/
xor	28395307   688120   735121   756022   769100   76662
bcopy	   28817071   453326   587886   685740   746232   77912
+idea-	
	1801295   4339   4193   4166   4196   4224
idea-cbc-	 31245   4272   4150   4136   4188   4168
+	
	462943   12883   13008   12980   13120   12888
ssl-blowf	 lsh-
	4048   14312   14369   14462   14444   14240
ssl-rc2-	124204   4211   4200   4226   4248   4248

```
______
ssl-
    | 117164 | 23569 | 29444 | 32970 | 35716 | 36976
rc4
-----
ssl-rc5-
    294663 | 10822 | 10803 | 10914 | 10812 | 10800
_____
ssl-rc5-cbc-
D | 294667 | 18364 | 18599 | 18600 | 18472 | 18592
______
_____
ssl-idea-
cbc | 1332064 | 5902 | 6203 | 6282 | 6324 | 6408
______
----+----
ssl-idea-cbc-
D | 31311 | 5863 | 6317 | 6390 | 6280 | 6216
______
ssl-des-
cbc | 455926 | 5507 | 5512 | 5536 | 5524 | 5504
----+----
ssl-des-ede-
cbc | 222911 | 1962 | 1954 | 1964 | 1956 | 1968
______
----+----
ssl-des-ede3-
cbc | 163273 | 1959 | 1948 | 1958 | 1928 | 1960
______
----+-----
ssl-desx-
cbc | 456771 | 5508 | 5384 | 5420 | 5424 | 5400
```

+							
ssl-cast-							
cbc	340860	9570	9515	9530	9624	9536	
						· <b></b>	
+	. – –						
rc16		424	30795	30680	30936	30864	3091
						· <b></b>	ļ
+							

# sync

sync [-R path]

-R path

Rendezvous with hosed AF\_UNIX socket at 'path'

Sync hose daemon pending writes to disk

# **EXAMPLE**

# Example 22. Example sync

hose sync -R /tmp/rendezvous

# terminate

```
terminate [-R path]
-R path
```

Rendezvous with hosed AF\_UNIX socket at 'path'

Terminate hose daemon

# **EXAMPLE**

### **Example 23. Example terminate**

\$ hose terminate -R /tmp/rendezvous

# unbindaspect

```
{\bf unbindaspect} \ [{\tt -a} \ {\it aspect}] \ [{\tt -R} \ {\it path}]
```

```
-a aspect
```

Use aspect number 'aspect'

-R path

Rendezvous with hosed AF\_UNIX socket at 'path'

Unbind aspect from device

### Example 24. Example unbindaspect

\$ hose unbindaspect -a 0 -R /tmp/rendezvous

# wipe

```
wipe [-1 cipher][-b bytes][extent]
```

-1 cipher

Cipher for encryption/decryption of keys

-b bytes

Block size in bytes

Wipe file or extent

### **EXAMPLE**

# Example 25. Example wipe

\$ hose wipe -1 rc16 maru.extent

Generating 32 cryptographically random bytes for rc16 erasure key

```
Erasing maru.extent (and mir-
rors) with rc16(/dev/random): pass 1 192512/1048576
Erasing maru.extent (and mir-
rors) with rc16(/dev/random): pass 1 522240/1048576
Erasing maru.extent (and mir-
rors) with rc16(/dev/random): pass 1 843776/1048576
Erasing maru.extent (and mir-
rors) with rc16(/dev/random): pass 1 1048576/1048576
```

# **ENVIROMENTAL VARIABLES**

#### MARU\_PASSPHRASE

Use the contents of this variable instead of ever prompting for a passphrase.

#### MARU\_PASSPHRASE\_n

Use the contents of this variable instead of prompting for a passphrase for aspect\_n. This variable is dominant over MARU\_PASSPHRASE

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