OpenSSH config tricks

Secure network connections to remote hosts, plus some tricks

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Assumptions

- know about ssh key-based logins
- know about ssh agents

Project goals

- hosts know their peers by name
- don't expose host IPs in config
- single command to furthest remote
- ssh key agent control at each hop

~/.ssh/config globbing

Host config details collected in file order, where the supplied name matches the stanza glob

Config added until file is exhausted, if hostname parameter changes, config is reread (not sure how recent this feature is, tbh)

~/.ssh/config globbing (ctd)

```
host eeny
   user joeb
   identityfile ssh/keys/joeb

host meeny
   user root

host *
   user jbloggs
   identityfile ssh/keys/jbloggs
```

ssh proxycommand

- tunnel ssh over another protocol
- usually corkscrew for http tunnels
- netcat or socat preferred, 8bit clean
- some versions of telnet might work

ssh proxycommand (ctd)

general use with netcat:

```
proxycommand nc %h %p
```

- uses netcat to open TCP tunnel
- %h replaced with remote hostname
- %p replaced with remote port
- other substitutions available too

config stanza breakdown

- 'host' shortcuts call 'host-via-host'
- 'host-via-*' give access details
- '*-via-host' give forwarding details
- '*' stanza gives general defaults

config stanza breakdown (ctd)

```
host meeny
   hostname meeny-via-eeny

host meeny-via-*
   forwardagent yes

host *-via-meeny
   proxycommand ...
```

ssh-in-ssh tunnels

- (ab)use the proxycommand
- combine ssh+nc to advance tunnel
- pro: single local config for all hops
- con: local end multiply encrypted

ssh-in-ssh tunnels (ctd)

```
host jump
   ...

host remote
   proxycommand ssh jump nc %h %p
```

ssh agents and keys

- pre-load agent with all tunnel keys
- tag '*-via-host' with required key
- use identitiesonly in general config

ssh agents and keys (ctd)

```
host *
   user jbloggs
   identitiesonly true
   identityfile ssh/keys/jbloggs
```

ssh agent forwarding

- pro: useful to pass keys
- con: dangerous to pass keys
- use forwardagent config
- be selective about exposure

ssh agent forwarding (ctd)

```
host meeny
   forwardagent yes

host *
   forwardagent no
```

controlmaster shenanigans

- post-authenticed sub-channel
- used to spawn remote commands
- can't modify established connection
- accessed via local sockets
- sockets can be shared
- may be set to persist
- con: post-auth, needs securing!

controlmaster shenanigans (ctd)

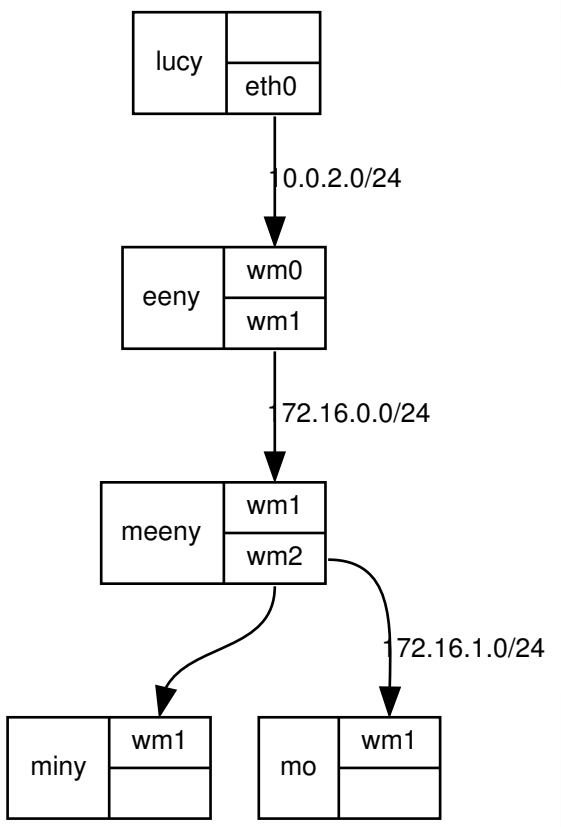
```
host *
   controlmaster auto
   controlpersist no
   controlpath run/%u@%L-%u@%n:%p
```

putting it all together

Our lab network:

- four VMs: eeny, meeny, miny and mo
- access to meeny only via eeny
- access to miny and mo only via meeny

putting it all together (ctd)



ssh/config

```
# eeny config

host eeny
  identityfile ssh/keys/joeb
  hostname localhost
  port 14710
  user joeb

host *-via-eeny
  identityfile ssh/keys/joeb
  proxycommand ssh -F ssh/config eeny /usr/pkg/sbin/nc \
    `echo %h | sed -e 's/-via.*//'` %p
```

ssh/config (ctd)

```
# meeny config

host meeny
  hostname meeny-via-eeny

host meeny-via-*
  forwardagent yes

host *-via-meeny
  proxycommand ssh -F ssh/config meeny /usr/pkg/sbin/nc \
    `echo %h | sed -e 's/-via.*//'` %p
```

ssh/config (ctd)

```
# miny config

host miny
  hostname miny-via-meeny

host miny-via-*
  forwardagent yes

host *-via-miny
# nop
```

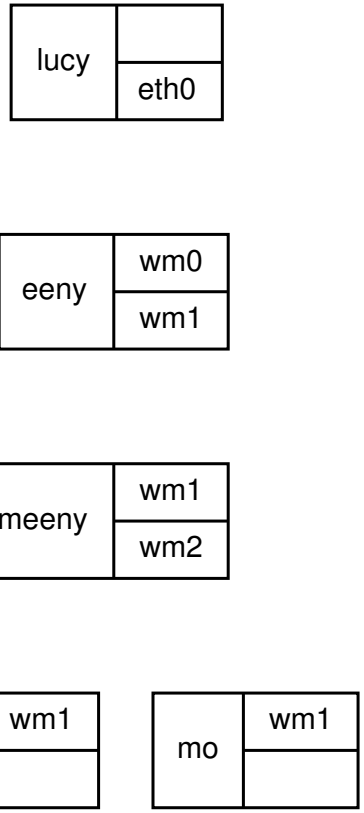
ssh/config (ctd)

```
# mo config

host mo
  hostname mo-via-meeny

host mo-via-*
  identityfile ssh/keys/sekret

host *-via-mo
# nop
```

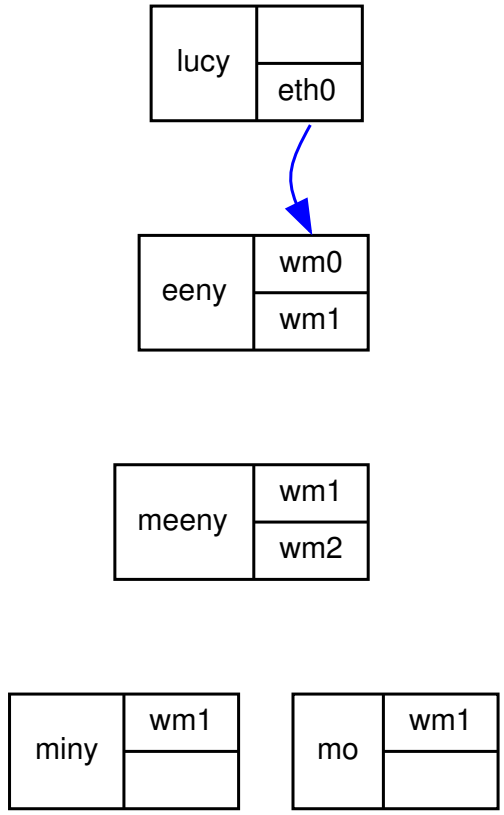
ssh/config (ctd)

```
# general config

host *
  user jbloggs
  identitiesonly true
  identityfile ssh/keys/jbloggs
  controlmaster auto
  controlpersist no
  controlpath run/%u@%L-%u@%n:%p
```

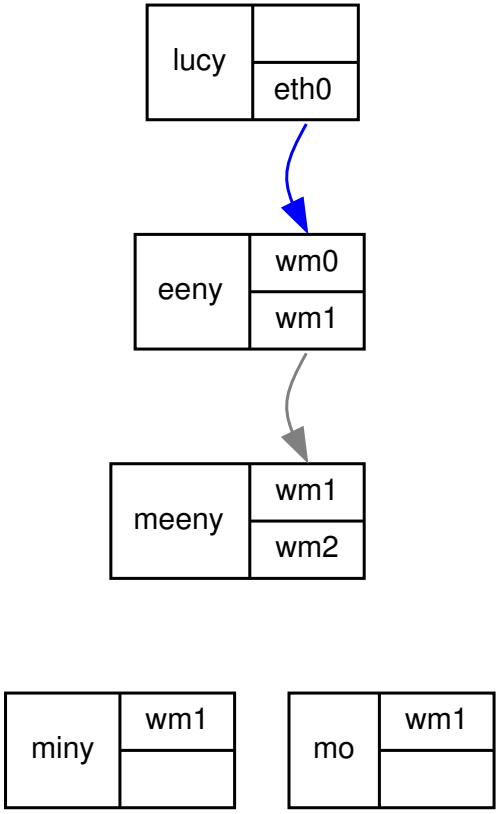
connection breakdown



connection breakdown



connection breakdown (ctd)



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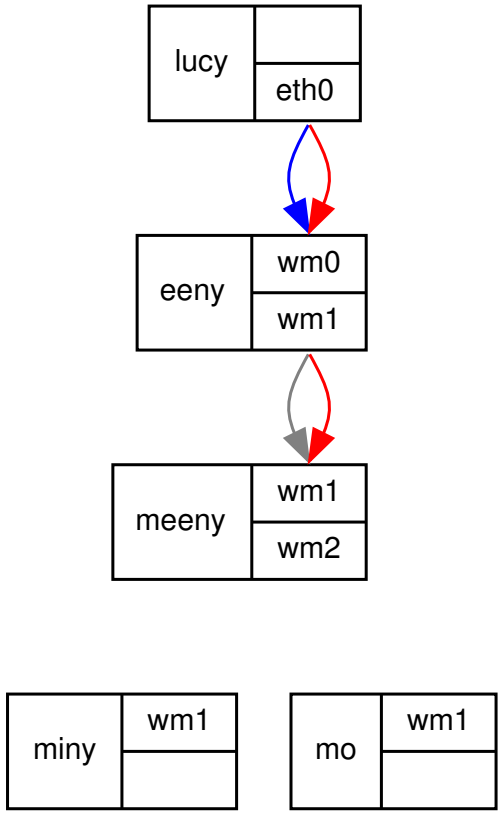

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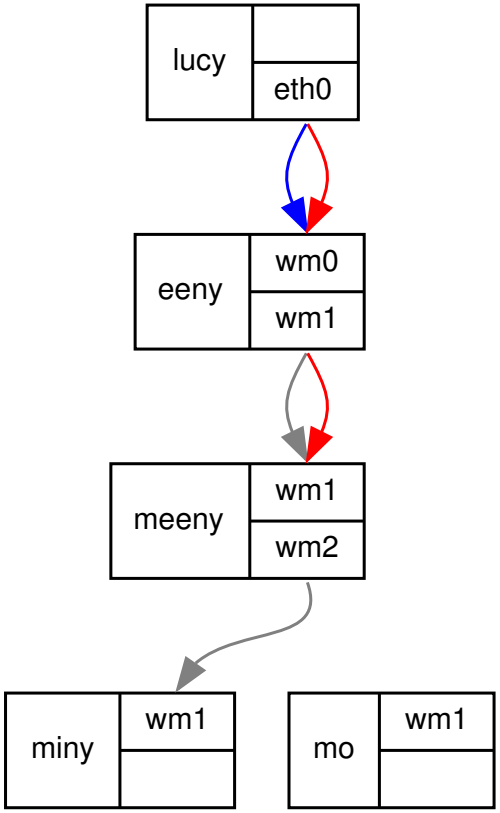

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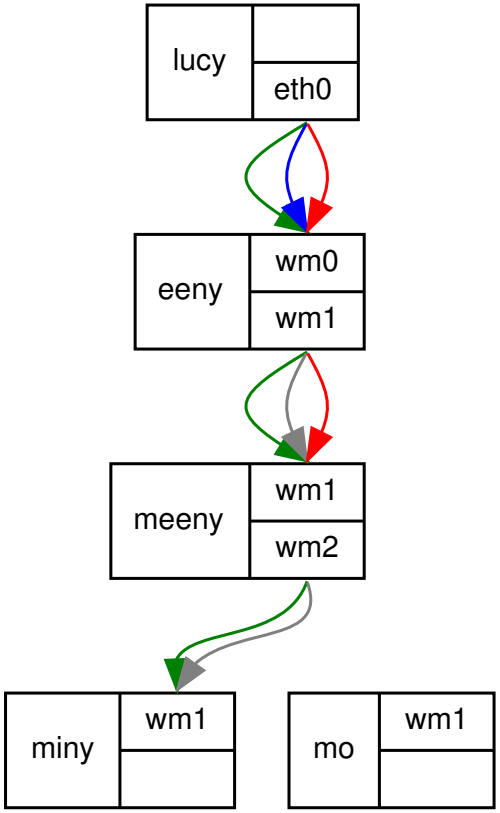

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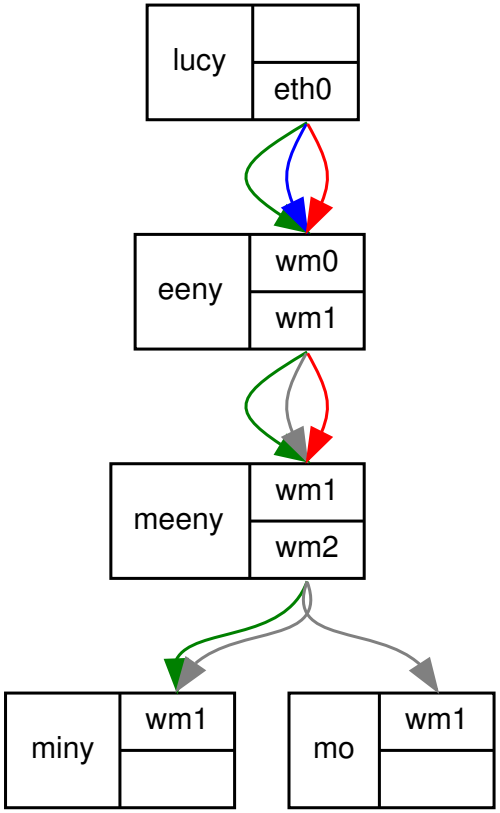
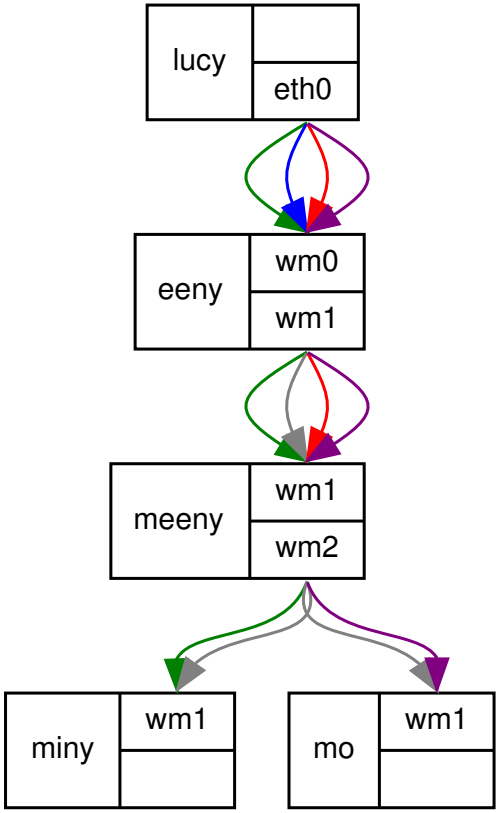


connection breakdown (ctd)



Live demo

crosses fingers

Comments, questions?

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