Trusty, BROUILLON

unbound.conf(5) - page de man

Version : unbound 1.5.8

NAME

unbound.conf
: Unbound configuration file.

SYNOPSIS

unbound.conf

DESCRIPTION

unbound.conf is used to configure **unbound**(8). The file format has attributes and values. Some attributes have attributes inside them. The notation is: attribute: value.

Comments start with # and last to the end of line. Empty lines are ignored as is whitespace at the beginning of a line.

The utility **unbound-checkconf**(8) can be used to check unbound.conf prior to usage.

EXAMPLE

An example config file is shown below. Copy this to /etc/unbound/unbound.conf and start the server with:

```
$ unbound -c /etc/unbound/unbound.conf
```

Most settings are the defaults. Stop the server with:

```
$ kill `cat /etc/unbound/unbound.pid`
```

Below is a minimal config file. The source distribution contains an extensive example.conf file with all the options.

/etc/unbound/unbound.conf

```
# unbound.conf(5) config file for unbound(8).
```

```
server:
    directory: "/etc/unbound"
    username: unbound
    # make sure unbound can access entropy from inside the chroot.
    # e.g. on linux the use these commands (on BSD, devfs(8) is
used):
    #      mount --bind -n /dev/random /etc/unbound/dev/random
    # and  mount --bind -n /dev/log /etc/unbound/dev/log
    chroot: "/etc/unbound"
    # logfile: "/etc/unbound/unbound.log"  #uncomment to use
logfile.
    pidfile: "/etc/unbound/unbound.pid"
    # verbosity: 1      # uncomment and increase to get more
logging.
    # listen on all interfaces, answer queries from the local
subnet.
    interface: 0.0.0.0
    interface: ::0
    access-control: 10.0.0.0/8 allow
    access-control: 2001:DB8::/64 allow
```

FILE FORMAT

There must be whitespace between keywords. Attribute keywords end with a colon ':'. An attribute is followed by its containing attributes, or a value.

Files can be included using the include: directive. It can appear anywhere, it accepts a single file name as argument. Processing continues as if the text from the included file was copied into the config file at that point. If also using chroot, using full path names for the included files works, relative pathnames for the included names work if the directory where the daemon is started equals its chroot/working directory. Wildcards can be used to include multiple files, see glob(7).

Server Options

These options are part of the **server:** clause.

verbosity: <number>
The verbosity number

level 0
means no verbosity, only errors
Level 1 (Default)
gives operational information
Level 2
gives detailed operational information
Level 3
gives query level information output per query

Level 4
gives algorithm level information
Level 5
logs client identification for cache misses

```
       statistics-interval: <seconds>
              The number of seconds between printing statistics to the log
for
              every  thread.  Disable with value 0 or "". Default is
disabled.
              The histogram statistics are only printed if replies  were
sent
              during  the  statistics  interval,  requestlist  statistics
are
              printed for every interval (but can be 0).  This is because
the
              median calculation requires data to be present.

       statistics-cumulative: <yes or no>
              If  enabled,  statistics  are cumulative since starting
unbound,
              without clearing the statistics counters after logging the
sta-
              tistics. Default is no.

       extended-statistics: <yes or no>
              If  enabled,  extended  statistics are printed from unbound-
con-
              trol(8).  Default is off, because keeping track of more
statis-
              tics takes time.  The counters are listed in unbound-
control(8).

       num-threads: <number>
              The  number  of threads to create to serve clients. Use 1 for
no
              threading.

       port: <port number>
              The port number, default 53, on which  the  server  responds
to
              queries.

       interface: <ip address[@port]>
              Interface  to  use  to connect to the network. This interface
is
              listened to for queries from clients, and answers to clients
are
              given  from  it.  Can be given multiple times to work on
several
              interfaces. If none are given the default is to listen to
```

```
local-
              host.   The  interfaces  are not changed on a reload (kill -
HUP)
              but only on restart.  A port number can be specified with
@port
              (without spaces between interface and port number), if not
spec-
              ified the default port (from port) is used.

       ip-address: <ip address[@port]>
              Same as interface: (for easy of compatibility with nsd.conf).

       interface-automatic: <yes or no>
              Detect source interface on UDP queries and copy them to
replies.
              This  feature  is experimental, and needs support in your OS
for
              particular socket options.  Default value is no.

       outgoing-interface: <ip address>
              Interface to use to connect to the network.  This  interface
is
              used  to send queries to authoritative servers and receive
their
              replies. Can be given multiple times to work on  several
inter-
              faces.  If  none  are  given  the default (all) is used. You
can
              specify the same interfaces in  interface:  and  outgoing-
inter-
              face:  lines,  the  interfaces  are then used for both
purposes.
              Outgoing queries are sent via a  random  outgoing  interface
to
              counter spoofing.

       outgoing-range: <number>
              Number  of ports to open. This number of file descriptors can
be
              opened per thread. Must be at least 1. Default depends  on
com-
              pile options. Larger numbers need extra resources from the
oper-
              ating system.  For performance a a very large value is best,
use
              libevent to make this possible.

       outgoing-port-permit: <port number or range>
              Permit  unbound  to  open this port or range of ports for use
to
```

```
              send queries.  A  larger  number  of  permitted  outgoing
ports
              increases  resilience against spoofing attempts. Make sure
these
              ports are not needed by other daemons.  By  default  only
ports
              above 1024 that have not been assigned by IANA are used.  Give
a
              port number or a range of the form "low-high", without spaces.

              The outgoing-port-permit and outgoing-port-avoid statements
are
              processed  in the line order of the config file, adding the
per-
              mitted ports and subtracting the avoided ports from the  set
of
              allowed  ports.   The  processing starts with the non IANA
allo-
              cated ports above 1024 in the set of allowed ports.

       outgoing-port-avoid: <port number or range>
              Do not permit unbound to open this port or range  of  ports
for
              use to send queries. Use this to make sure unbound does not
grab
              a port that another daemon needs. The port  is  avoided  on
all
              outgoing  interfaces,  both  IP4 and IP6.  By default only
ports
              above 1024 that have not been assigned by IANA are used.  Give
a
              port number or a range of the form "low-high", without spaces.

       outgoing-num-tcp: <number>
              Number  of  outgoing TCP buffers to allocate per thread.
Default
              is 10. If set to 0, or if do-tcp is  "no",  no  TCP  queries
to
              authoritative   servers  are  done.   For  larger
installations
              increasing this value is a good idea.

       incoming-num-tcp: <number>
              Number of incoming TCP buffers to allocate per  thread.
Default
              is  10.  If  set to 0, or if do-tcp is "no", no TCP queries
from
              clients are accepted. For larger installations  increasing
this
              value is a good idea.
```

```
       edns-buffer-size: <number>
              Number  of bytes size to advertise as the EDNS reassembly
buffer
              size.  This is the value put into  datagrams  over  UDP
towards
              peers.   The actual buffer size is determined by msg-buffer-
size
              (both for TCP and UDP).  Do not  set  higher  than  that
value.
              Default  is 4096 which is RFC recommended.  If you have
fragmen-
              tation reassembly problems, usually seen  as  timeouts,  then
a
              value of 1480 can fix it.  Setting to 512 bypasses even the
most
              stringent path MTU problems, but is seen as extreme,  since
the
              amount of TCP fallback generated is excessive (probably also
for
              this resolver, consider tuning the outgoing tcp number).

       max-udp-size: <number>
              Maximum UDP response size (not applied to TCP response).
65536
              disables the udp response size maximum, and uses the choice
from
              the client, always.  Suggested values are 512 to  4096.
Default
              is 4096.

       msg-buffer-size: <number>
              Number  of  bytes  size of the message buffers. Default is
65552
              bytes, enough for 64 Kb packets, the maximum DNS  message
size.
              No  message  larger  than  this  can be sent or received. Can
be
              reduced to use less memory, but some requests for DNS data,
such
              as for huge resource records, will result in a SERVFAIL reply
to
              the client.

       msg-cache-size: <number>
              Number of  bytes  size  of  the  message  cache.  Default  is
4
              megabytes.   A  plain number is in bytes, append 'k', 'm' or
'g'
              for kilobytes, megabytes or  gigabytes  (1024*1024  bytes  in
a
```

```
              megabyte).

       msg-cache-slabs: <number>
              Number  of  slabs  in  the message cache. Slabs reduce lock
con-
              tention by threads.  Must be  set  to  a  power  of  2.
Setting
              (close) to the number of cpus is a reasonable guess.

       num-queries-per-thread: <number>
              The  number of queries that every thread will service
simultane-
              ously.  If more queries  arrive  that  need  servicing,  and
no
              queries  can  be  jostled  out  (see  jostle-timeout),  then
the
              queries are dropped. This forces the client to  resend  after
a
              timeout;  allowing  the  server  time  to  work  on the
existing
              queries. Default depends on compile options, 512 or 1024.

       jostle-timeout: <msec>
              Timeout used when the server is very busy.  Set to a value
that
              usually  results  in one roundtrip to the authority servers.
If
              too many queries arrive, then 50% of the queries are allowed
to
              run  to  completion, and the other 50% are replaced with the
new
              incoming query if  they  have  already  spent  more  than
their
              allowed  time.   This protects against denial of service by
slow
              queries or high query rates.   Default  200  milliseconds.
The
              effect  is  that the qps for long-lasting queries is about
(num-
              queriesperthread / 2) / (average time  for  such  long
queries)
              qps.   The  qps  for  short  queries  can  be about
(numqueries-
              perthread / 2)  /  (jostletimeout  in  whole  seconds)  qps
per
              thread, about (1024/2)*5 = 2560 qps by default.

       delay-close: <msec>
              Extra  delay  for timeouted UDP ports before they are closed,
in
              msec.  Default is 0, and that disables it.  This  prevents
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very
              delayed  answer  packets  from  the upstream (recursive)
servers
              from bouncing against closed ports and setting off all  sort
of
              close-port  counters,  with eg. 1500 msec.  When timeouts
happen
              you need extra sockets, it checks the ID and remote IP of
pack-
              ets,  and  unwanted  packets  are  added  to the unwanted
packet
              counter.

       so-rcvbuf: <number>
              If not 0, then set the SO_RCVBUF socket option to get more
buf-
              fer space on UDP port 53 incoming queries.  So that short
spikes
              on busy servers do not drop  packets  (see  counter  in
netstat
              -su).   Default  is 0 (use system value).  Otherwise, the
number
              of bytes to ask for, try "4m" on a busy server.  The OS caps
it
              at  a  maximum, on linux unbound needs root permission to
bypass
              the limit, or the admin can use  sysctl  net.core.rmem_max.
On
              BSD  change kern.ipc.maxsockbuf in /etc/sysctl.conf.  On
OpenBSD
              change header and recompile kernel. On Solaris ndd -set
/dev/udp
              udp_max_buf 8388608.

       so-sndbuf: <number>
              If  not 0, then set the SO_SNDBUF socket option to get more
buf-
              fer space on UDP port 53 outgoing queries.  This for  very
busy
              servers  handles  spikes  in  answer  traffic,  otherwise
'send:
              resource temporarily unavailable' can  get  logged,  the
buffer
              overrun  is also visible by netstat -su.  Default is 0 (use
sys-
              tem value).  Specify the number of bytes to ask for, try "4m"
on
              a  very  busy  server.   The  OS  caps it at a maximum, on
linux
              unbound needs root permission to bypass the limit, or the
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```
admin
              can  use  sysctl net.core.wmem_max.  On BSD, Solaris changes
are
              similar to so-rcvbuf.

       so-reuseport: <yes or no>
              If yes, then  open  dedicated  listening  sockets  for
incoming
              queries  for  each thread and try to set the SO_REUSEPORT
socket
              option on each  socket.   May  distribute  incoming  queries
to
              threads  more  evenly.  Default is no.  On Linux it is
supported
              in kernels >= 3.9.  On other systems, FreeBSD, OSX it  may
also
              work.   You  can enable it (on any platform and kernel), it
then
              attempts to open the port and passes the option if it was
avail-
              able  at compile time, if that works it is used, if it fails,
it
              continues silently (unless verbosity 3) without the option.

       ip-transparent: <yes or no>
              If yes, then use IP_TRANSPARENT socket option on  sockets
where
              unbound  is listening for incoming traffic.  Default no.
Allows
              you to bind to non-local interfaces.  For example for  non-
exis-
              tant  IP  addresses  that are going to exist later on, with
host
              failover configuration.  This is a lot like interface-
automatic,
              but  that  one  services all interfaces and with this option
you
              can select which (future) interfaces  unbound  provides
service
              on.   This  option needs unbound to be started with root
permis-
              sions on some systems.  The option uses  IP_BINDANY  on
FreeBSD
              systems.

       rrset-cache-size: <number>
              Number of bytes size of the RRset cache. Default is 4
megabytes.
              A plain number is in bytes, append 'k', 'm'  or  'g'  for
kilo-
              bytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).
```

```
       rrset-cache-slabs: <number>
              Number of slabs in the RRset cache. Slabs reduce lock
contention
              by threads.  Must be set to a power of 2.

       cache-max-ttl: <seconds>
              Time to live maximum for  RRsets  and  messages  in  the
cache.
              Default  is  86400  seconds  (1  day).  If the maximum kicks
in,
              responses to clients still get decrementing TTLs  based  on
the
              original  (larger)  values.   When the internal TTL expires,
the
              cache item has expired.  Can be set lower to force the
resolver
              to query for data often, and not trust (very large) TTL
values.

       cache-min-ttl: <seconds>
              Time  to  live  minimum  for  RRsets  and messages in the
cache.
              Default is 0.  If the minimum kicks in, the data is  cached
for
              longer than the domain owner intended, and thus less queries
are
              made to look up the data.  Zero makes sure the data in the
cache
              is  as the domain owner intended, higher values, especially
more
              than an hour or so, can lead to trouble as the data in the
cache
              does not match up with the actual data any more.

       cache-max-negative-ttl: <seconds>
              Time to live maximum for negative responses, these have a SOA
in
              the authority section that is limited in time.  Default is
3600.

       infra-host-ttl: <seconds>
              Time to live for entries in the host cache. The host cache
con-
              tains  roundtrip  timing, lameness and EDNS support
information.
              Default is 900.

       infra-cache-slabs: <number>
              Number of slabs in the infrastructure cache. Slabs  reduce
lock
```

```
              contention by threads. Must be set to a power of 2.

       infra-cache-numhosts: <number>
              Number  of  hosts  for  which  information is cached. Default
is
              10000.

       infra-cache-min-rtt: <msec>
              Lower limit for dynamic retransmit timeout calculation in
infra-
              structure cache. Default is 50 milliseconds. Increase this
value
              if using forwarders needing more time to do recursive name
reso-
              lution.

       do-ip4: <yes or no>
              Enable  or  disable  whether ip4 queries are answered or
issued.
              Default is yes.

       do-ip6: <yes or no>
              Enable or disable whether ip6 queries are  answered  or
issued.
              Default  is yes.  If disabled, queries are not answered on
IPv6,
              and queries are not sent on IPv6 to  the  internet
nameservers.
              With  this option you can disable the ipv6 transport for
sending
              DNS traffic, it does not impact the contents of the DNS
traffic,
              which may have ip4 and ip6 addresses in it.

       do-udp: <yes or no>
              Enable  or  disable  whether UDP queries are answered or
issued.
              Default is yes.

       do-tcp: <yes or no>
              Enable or disable whether TCP queries are  answered  or
issued.
              Default is yes.

       tcp-mss: <number>
              Maximum  segment  size  (MSS)  of TCP socket on which the
server
              responds to queries. Value lower than  common  MSS  on
Ethernet
              (1220 for example) will address path MTU problem.  Note that
not
```

```
              all platform supports socket option  to  set  MSS
(TCP_MAXSEG).
              Default  is  system  default MSS determined by interface MTU
and
              negotiation between server and client.

       outgoing-tcp-mss: <number>
              Maximum segment size (MSS) of TCP socket  for  outgoing
queries
              (from  Unbound to other servers). Value lower than common MSS
on
              Ethernet (1220 for example) will address path MTU problem.
Note
              that  not  all  platform  supports  socket  option  to  set
MSS
              (TCP_MAXSEG).  Default  is  system  default  MSS  determined
by
              interface MTU and negotiation between Unbound and other
servers.

       tcp-upstream: <yes or no>
              Enable  or disable whether the upstream queries use TCP only
for
              transport.  Default is no.  Useful in tunneling scenarios.

       ssl-upstream: <yes or no>
              Enabled or disable whether the upstream queries use SSL only
for
              transport.   Default is no.  Useful in tunneling scenarios.
The
              SSL contains plain DNS in TCP wireformat.  The other server
must
              support this (see ssl-service-key).

       ssl-service-key: <file>
              If  enabled, the server provider SSL service on its TCP
sockets.
              The clients have to use ssl-upstream: yes.  The file is the
pri-
              vate  key for the TLS session.  The public certificate is in
the
              ssl-service-pem file.  Default is "", turned  off.   Requires
a
              restart (a reload is not enough) if changed, because the
private
              key is read while root permissions are held  and  before
chroot
              (if  any).   Normal  DNS  TCP  service is not provided and
gives
              errors, this service is best run with a different  port:
```

```
config
              or @port suffixes in the interface config.

       ssl-service-pem: <file>
              The  public  key  certificate  pem  file  for  the  ssl
service.
              Default is "", turned off.

       ssl-port: <number>
              The port number on which to provide  TCP  SSL  service,
default
              853, only interfaces configured with that port number as
@number
              get the SSL service.

       do-daemonize: <yes or no>
              Enable or disable whether the  unbound  server  forks  into
the
              background as a daemon. Default is yes.

       access-control: <IP netblock> <action>
              The  netblock  is  given  as  an  IP4  or IP6 address with
/size
              appended for a classless network block. The action can be
deny,
              refuse,  allow, allow_snoop, deny_non_local or
refuse_non_local.
              The most specific netblock match is used, if none match deny
is
              used.

              The action deny stops queries from hosts from that netblock.

              The  action  refuse  stops  queries  too,  but sends a DNS
rcode
              REFUSED error message back.

              The action allow gives access to clients from that netblock.
It
              gives  only  access  for recursion clients (which is what
almost
              all clients need).  Nonrecursive queries are refused.

              The allow action does allow nonrecursive queries to  access
the
              local-data that is configured.  The reason is that this does
not
              involve the  unbound  server  recursive  lookup  algorithm,
and
              static data is served in the reply.  This supports normal
opera-
```

```
               tions where nonrecursive queries are made for the
authoritative
               data.   For  nonrecursive  queries  any replies from the
dynamic
               cache are refused.

               The action allow_snoop gives nonrecursive access too.  This
give
               both  recursive  and non recursive access.  The name
allow_snoop
               refers to  cache  snooping,  a  technique  to  use
nonrecursive
               queries  to  examine  the  cache  contents (for malicious
acts).
               However, nonrecursive queries can also be a  valuable
debugging
               tool (when you want to examine the cache contents). In that
case
               use allow_snoop for your administration host.

               By default only localhost is allowed, the rest is refused.
The
               default  is  refused, because that is protocol-friendly. The
DNS
               protocol is not designed to handle dropped packets due  to
pol-
               icy,  and  dropping  may  result in (possibly excessive)
retried
               queries.

               The deny_non_local and refuse_non_local settings are  for
hosts
               that are only allowed to query for the authoritative local-
data,
               they are not allowed full recursion but only  the  static
data.
               With  deny_non_local,  messages that are disallowed are
dropped,
               with refuse_non_local they receive error code REFUSED.

       chroot: <directory>
               If chroot is enabled, you should pass the configfile  (from
the
               commandline)  as  a  full path from the original root. After
the
               chroot has been performed the now defunct portion of the
config
               file  path  is  removed  to be able to reread the config after
a
               reload.
```

```
              All other file paths (working dir, logfile, roothints,  and
key
              files)  can  be  specified  in several ways: as an absolute
path
              relative to the new root, as a  relative  path  to  the
working
              directory, or as an absolute path relative to the original
root.
              In the last case the path is adjusted to remove the unused
por-
              tion.

              The  pidfile can be either a relative path to the working
direc-
              tory, or an absolute path relative to the original root.  It
is
              written  just  prior  to  chroot  and dropping permissions.
This
              allows the pidfile to be /var/run/unbound.pid and the chroot
to
              be /var/unbound, for example.

              Additionally,  unbound  may  need  to  access  /dev/random
(for
              entropy) from inside the chroot.

              If given a chroot is done to the given directory. The default
is
              "/usr/local/etc/unbound". If you give "" no chroot is
performed.

       username: <name>
              If  given,  after  binding  the  port  the  user  privileges
are
              dropped. Default is "unbound". If you give username: "" no
user
              change is performed.

              If  this  user  is  not capable of binding the port, reloads
(by
              signal HUP) will still retain the opened ports.  If  you
change
              the  port  number  in  the config file, and that new port
number
              requires privileges, then a  reload  will  fail;  a  restart
is
              needed.

       directory: <directory>
              Sets   the   working  directory  for  the  program.  Default
is
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               "/usr/local/etc/unbound".  On Windows the string
"%EXECUTABLE%"
               tries to change to the directory that unbound.exe resides in.

       logfile: <filename>
               If  ""  is given, logging goes to stderr, or nowhere once
daemo-
               nized.  The logfile is appended to, in the following format:
               [seconds since 1970] unbound[pid:tid]: type: message.
               If this option is given, the use-syslog  is  option  is  set
to
               "no".  The logfile is reopened (for append) when the config
file
               is reread, on SIGHUP.

       use-syslog: <yes or no>
               Sets unbound to send log messages to  the  syslogd,  using
sys-
               log(3).   The  log  facility  LOG_DAEMON  is used, with
identity
               "unbound".  The logfile setting is overridden when use-syslog
is
               turned on.  The default is to log to syslog.

       log-time-ascii: <yes or no>
               Sets  logfile  lines to use a timestamp in UTC ascii. Default
is
               no, which prints the seconds since 1970 in brackets.  No
effect
               if  using  syslog,  in  that  case  syslog formats the
timestamp
               printed into the log files.

       log-queries: <yes or no>
               Prints one line per query to the log, with the log timestamp
and
               IP  address, name, type and class.  Default is no.  Note that
it
               takes time to print these lines which makes the server
(signifi-
               cantly)  slower.   Odd  (nonprintable)  characters  in names
are
               printed as '?'.

       pidfile: <filename>
               The  process  id  is   written   to   the   file.   Default
is
               "/usr/local/etc/unbound/unbound.pid".  So,
               kill -HUP `cat /usr/local/etc/unbound/unbound.pid`
               triggers a reload,
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              kill -TERM `cat /usr/local/etc/unbound/unbound.pid`
              gracefully terminates.

       root-hints: <filename>
              Read  the  root  hints from this file. Default is nothing,
using
              builtin hints for the IN class. The file has the format of
zone
              files,  with  root  nameserver  names  and  addresses  only.
The
              default may become outdated, when servers change,  therefore
it
              is good practice to use a root-hints file.

       hide-identity: <yes or no>
              If enabled id.server and hostname.bind queries are refused.

       identity: <string>
              Set  the identity to report. If set to "", the default, then
the
              hostname of the server is returned.

       hide-version: <yes or no>
              If enabled version.server and version.bind queries are
refused.

       version: <string>
              Set the version to report. If set to "", the default,  then
the
              package version is returned.

       target-fetch-policy: <"list of numbers">
              Set  the  target fetch policy used by unbound to determine if
it
              should fetch nameserver target addresses opportunistically.
The
              policy is described per dependency depth.

              The  number  of  values  determines the maximum dependency
depth
              that unbound will pursue in answering a query.  A  value  of
-1
              means to fetch all targets opportunistically for that
dependency
              depth. A value of 0 means to fetch on demand  only.  A
positive
              value fetches that many targets opportunistically.

              Enclose the list between quotes ("") and put spaces between
num-
              bers.  The default is "3 2 1 0 0". Setting all zeroes, "0 0 0
```

```
0
              0"  gives  behaviour closer to that of BIND 9, while setting
"-1
              -1 -1 -1 -1" gives behaviour rumoured to be closer  to  that
of
              BIND 8.

       harden-short-bufsize: <yes or no>
              Very  small  EDNS buffer sizes from queries are ignored.
Default
              is off, since it is legal  protocol  wise  to  send  these,
and
              unbound tries to give very small answers to these queries,
where
              possible.

       harden-large-queries: <yes or no>
              Very large queries are ignored. Default  is  off,  since  it
is
              legal  protocol  wise  to send these, and could be necessary
for
              operation if TSIG or EDNS payload is very large.

       harden-glue: <yes or no>
              Will trust glue only if it  is  within  the  servers
authority.
              Default is on.

       harden-dnssec-stripped: <yes or no>
              Require  DNSSEC  data  for trust-anchored zones, if such data
is
              absent, the zone becomes bogus. If turned  off,  and  no
DNSSEC
              data  is  received  (or the DNSKEY data fails to validate),
then
              the zone is made insecure, this behaves like there is  no
trust
              anchor.  You  could turn this off if you are sometimes behind
an
              intrusive firewall (of some sort) that removes DNSSEC data
from
              packets,  or  a  zone  changes  from signed to unsigned to
badly
              signed often. If turned off you run  the  risk  of  a
downgrade
              attack that disables security for a zone. Default is on.

       harden-below-nxdomain: <yes or no>
              From  draft-vixie-dnsext-resimprove, returns nxdomain to
queries
```

```
              for a name below another name that is already known to be
nxdo-
              main.   DNSSEC  mandates  noerror  for empty nonterminals,
hence
              this is possible.  Very old software might return  nxdomain
for
              empty  nonterminals  (that usually happen for reverse IP
address
              lookups), and thus may be incompatible with  this.   To  try
to
              avoid  this  only  DNSSEC-secure nxdomains are used, because
the
              old software does not have DNSSEC.  Default is off.

       harden-referral-path: <yes or no>
              Harden the referral path by performing  additional  queries
for
              infrastructure data.  Validates the replies if trust anchors
are
              configured and the zones are signed.  This enforces DNSSEC
vali-
              dation  on  nameserver NS sets and the nameserver addresses
that
              are encountered on the referral path  to  the  answer.
Default
              off, because it burdens the authority servers, and it is not
RFC
              standard, and could lead to performance problems because of
the
              extra  query  load  that is generated.  Experimental option.
If
              you enable it  consider  adding  more  numbers  after  the
tar-
              get-fetch-policy to increase the max depth that is checked to.

       harden-algo-downgrade: <yes or no>
              Harden  against algorithm downgrade when multiple algorithms
are
              advertised in the DS record.  If no, allows  the  weakest
algo-
              rithm  to  validate the zone.  Default is no.  Zone signers
must
              produce zones that allow this feature  to  work,  but
sometimes
              they  do not, and turning this option off avoids that
validation
              failure.

       use-caps-for-id: <yes or no>
              Use  0x20-encoded  random  bits  in  the  query  to  foil
spoof
```

```
              attempts.   This  perturbs  the lowercase and uppercase of
query
              names sent to authority servers and checks if  the  reply
still
              has  the  correct casing.  Disabled by default.  This feature
is
              an experimental implementation of draft dns-0x20.

       caps-whitelist: <domain>
              Whitelist the domain so that it  does  not  receive  caps-for-
id
              perturbed  queries.   For  domains  that do not support 0x20
and
              also fail with fallback  because  they  keep  sending
different
              answers, like some load balancers.  Can be given multiple
times,
              for different domains.

       qname-minimisation: <yes or no>
              Send minimum  amount  of  information  to  upstream  servers
to
              enhance privacy.  Only sent minimum required labels of the
QNAME
              and set QTYPE to NS when possible. Best  effort  approach,
full
              QNAME and original QTYPE will be sent when upstream replies
with
              a RCODE other than NOERROR. Default is off.

       private-address: <IP address or subnet>
              Give IPv4 of IPv6 addresses  or  classless  subnets.  These
are
              addresses  on  your  private  network, and are not allowed to
be
              returned for public internet  names.   Any  occurrence  of
such
              addresses are removed from DNS answers. Additionally, the
DNSSEC
              validator may mark the  answers  bogus.  This  protects
against
              so-called  DNS  Rebinding, where a user browser is turned into
a
              network proxy, allowing remote access  through  the  browser
to
              other  parts of your private network.  Some names can be
allowed
              to contain your private addresses, by default all the local-
data
              that  you  configured  is  allowed to, and you can specify
```

```
addi-
              tional names using private-domain.   No  private  addresses
are
              enabled  by default.  We consider to enable this for the
RFC1918
              private IP address space by  default  in  later  releases.
That
              would  enable  private  addresses  for  10.0.0.0/8
172.16.0.0/12
              192.168.0.0/16 169.254.0.0/16 fd00::/8 and fe80::/10, since
the
              RFC  standards  say these addresses should not be visible on
the
              public internet.  Turning on 127.0.0.0/8 would hinder many
spam-
              blocklists   as  they  use  that.   Adding  ::ffff:0:0/96
stops
              IPv4-mapped IPv6 addresses from bypassing the filter.

       private-domain: <domain name>
              Allow this domain, and all its  subdomains  to  contain
private
              addresses.   Give  multiple times to allow multiple domain
names
              to contain private addresses. Default is none.

       unwanted-reply-threshold: <number>
              If set, a total number of unwanted replies is kept track  of
in
              every thread.  When it reaches the threshold, a defensive
action
              is taken and a warning is printed to  the  log.   The
defensive
              action  is  to  clear  the  rrset  and message caches,
hopefully
              flushing away any poison.  A value of 10 million  is
suggested.
              Default is 0 (turned off).

       do-not-query-address: <IP address>
              Do  not  query  the  given IP address. Can be IP4 or IP6.
Append
              /num to indicate a classless delegation  netblock,  for
example
              like 10.2.3.4/24 or 2001::11/64.

       do-not-query-localhost: <yes or no>
              If  yes, localhost is added to the do-not-query-address
entries,
              both IP6 ::1 and IP4 127.0.0.1/8. If no, then localhost  can
be
```

```
              used to send queries to. Default is yes.

       prefetch: <yes or no>
              If yes, message cache elements are prefetched before they
expire
              to keep the cache up to date.  Default is  no.   Turning  it
on
              gives about 10 percent more traffic and load on the machine,
but
              popular items do not expire from the cache.

       prefetch-key: <yes or no>
              If yes, fetch the DNSKEYs earlier  in  the  validation
process,
              when  a  DS  record  is encountered.  This lowers the latency
of
              requests.  It does use a little more CPU.  Also if the cache
is
              set to 0, it is no use. Default is no.

       rrset-roundrobin: <yes or no>
              If yes, Unbound rotates RRSet order in response (the random
num-
              ber is taken from the query ID, for speed  and  thread
safety).
              Default is no.

       minimal-responses: <yes or no>
              If  yes,  Unbound  doesn't  insert authority/additional
sections
              into response messages when those  sections  are  not
required.
              This  reduces  response  size  significantly,  and may avoid
TCP
              fallback for some responses.  This may cause a  slight
speedup.
              The  default  is no, because the DNS protocol RFCs mandate
these
              sections, and the additional content could be of  use  and
save
              roundtrips for clients.

       module-config: <"module names">
              Module  configuration,  a list of module names separated by
spa-
              ces, surround the string with quotes (""). The  modules  can
be
              validator,  iterator.  Setting this to "iterator" will result
in
              a non-validating server.  Setting this to  "validator
```

```
iterator"
              will  turn on DNSSEC validation.  The ordering of the modules
is
              important.  You must also set trust-anchors for validation to
be
              useful.

       trust-anchor-file: <filename>
              File  with  trusted  keys  for  validation.  Both  DS and
DNSKEY
              entries can appear in the file. The format of the  file  is
the
              standard  DNS  Zone  file  format.   Default  is "", or no
trust
              anchor file.

       auto-trust-anchor-file: <filename>
              File with trust anchor for  one  zone,  which  is  tracked
with
              RFC5011  probes.   The  probes are several times per month,
thus
              the machine must be online frequently.  The initial file can
be
              one  with  contents as described in trust-anchor-file.  The
file
              is written to when the anchor is updated, so  the  unbound
user
              must have write permission.

       trust-anchor: <"Resource Record">
              A  DS  or  DNSKEY  RR  for a key to use for validation.
Multiple
              entries can be given to specify multiple trusted keys, in
addi-
              tion  to the trust-anchor-files.  The resource record is
entered
              in the same format as 'dig' or 'drill'  prints  them,  the
same
              format  as in the zone file. Has to be on a single line, with
""
              around it. A TTL can be specified for ease of cut and paste,
but
              is ignored.  A class can be specified, but class IN is
default.

       trusted-keys-file: <filename>
              File  with  trusted  keys  for validation. Specify more than
one
              file  with  several  entries,   one   file   per   entry.
Like
              trust-anchor-file  but  has  a  different file format. Format
```

```
is
              BIND-9 style format, the trusted-keys {  name  flag  proto
algo
              "key";  };  clauses  are  read.  It is possible to use
wildcards
              with this statement, the wildcard is expanded on  start  and
on
              reload.

       dlv-anchor-file: <filename>
              This option was used during early days DNSSEC deployment when
no
              parent-side  DS  record  registrations  were  easily
available.
              Nowadays, it is best to have DS records registered with the
par-
              ent zone (many top level zones are signed).  File  with
trusted
              keys  for  DLV (DNSSEC Lookaside Validation). Both DS and
DNSKEY
              entries can be used in the file,  in  the  same  format  as
for
              trust-anchor-file:  statements.  Only one DLV can be
configured,
              more would be slow. The DLV configured is used as a root
trusted
              DLV,  this means that it is a lookaside for the root. Default
is
              "", or no dlv anchor file.  DLV is going to  be
decommissioned.
              Please do not use it any more.

       dlv-anchor: <"Resource Record">
              Much  like  trust-anchor,  this  is  a DLV anchor with the DS
or
              DNSKEY inline.  DLV is going to be  decommissioned.   Please
do
              not use it any more.

       domain-insecure: <domain name>
              Sets  domain  name  to  be  insecure,  DNSSEC  chain of trust
is
              ignored towards the domain name.  So a trust  anchor  above
the
              domain  name  can  not  make the domain secure with a DS
record,
              such a DS record is  then  ignored.   Also  keys  from  DLV
are
              ignored  for the domain.  Can be given multiple times to
specify
```

```
              multiple domains that are treated as if unsigned.   If  you
set
              trust anchors for the domain they override this setting (and
the
              domain is secured).

              This can be useful if you want to make sure a trust  anchor
for
              external  lookups does not affect an (unsigned) internal
domain.
              A DS record externally can create validation failures  for
that
              internal domain.

       val-override-date: <rrsig-style date spec>
              Default  is "" or "0", which disables this debugging feature.
If
              enabled by giving a RRSIG style date, that date is used for
ver-
              ifying RRSIG inception and expiration dates, instead of the
cur-
              rent date. Do not set this unless you  are  debugging
signature
              inception  and  expiration.  The value -1 ignores the date
alto-
              gether, useful for some special applications.

       val-sig-skew-min: <seconds>
              Minimum number of seconds of clock skew to  apply  to
validated
              signatures.   A  value of 10% of the signature lifetime
(expira-
              tion - inception) is used, capped by this setting.   Default
is
              3600  (1  hour)  which  allows for daylight savings
differences.
              Lower this value for more strict checking of short lived
signa-
              tures.

       val-sig-skew-max: <seconds>
              Maximum  number  of  seconds of clock skew to apply to
validated
              signatures.  A value of 10% of the signature  lifetime
(expira-
              tion  -  inception) is used, capped by this setting.  Default
is
              86400 (24 hours) which allows for timezone setting  problems
in
              stable  domains.  Setting both min and max very low disables
the
```

```
              clock skew allowances.  Setting both min and max very high
makes
              the validator check the signature timestamps less strictly.

       val-bogus-ttl: <number>
              The  time  to  live for bogus data. This is data that has
failed
              validation; due to invalid signatures or other checks.  The
TTL
              from  that  data  cannot  be  trusted,  and  this  value is
used
              instead. The value is in seconds, default 60.  The time
interval
              prevents repeated revalidation of bogus data.

       val-clean-additional: <yes or no>
              Instruct  the  validator to remove data from the additional
sec-
              tion of secure messages that are not signed  properly.
Messages
              that  are  insecure,  bogus,  indeterminate or unchecked are
not
              affected. Default is yes. Use this setting to protect the
users
              that  rely on this validator for authentication from
potentially
              bad data in the additional section.

       val-log-level: <number>
              Have  the  validator  print  validation  failures  to  the
log.
              Regardless  of the verbosity setting.  Default is 0, off.  At
1,
              for every user query that fails a line is printed to  the
logs.
              This  way  you  can monitor what happens with validation.  Use
a
              diagnosis tool, such as dig or drill, to find out why
validation
              is  failing  for  these  queries.  At 2, not only the query
that
              failed is printed but also the reason why unbound thought it
was
              wrong and which server sent the faulty data.

       val-permissive-mode: <yes or no>
              Instruct  the validator to mark bogus messages as
indeterminate.
              The security checks are performed, but if the  result  is
bogus
```

```
              (failed  security),  the  reply  is not withheld from the
client
              with SERVFAIL as usual. The client receives the bogus data.
For
              messages  that  are  found  to  be  secure  the AD bit is set
in
              replies. Also logging is performed as for full validation.
The
              default value is "no".

       ignore-cd-flag: <yes or no>
              Instruct  unbound  to ignore the CD flag from clients and
refuse
              to return bogus answers to them.  Thus, the  CD  (Checking
Dis-
              abled)  flag does not disable checking any more.  This is
useful
              if legacy (w2008) servers that set the CD flag but cannot
vali-
              date  DNSSEC  themselves  are the clients, and then unbound
pro-
              vides them with DNSSEC protection.  The default value is "no".

       val-nsec3-keysize-iterations: <"list of values">
              List of keysize and iteration count values, separated by
spaces,
              surrounded  by quotes. Default is "1024 150 2048 500 4096
2500".
              This determines the maximum allowed NSEC3 iteration count
before
              a  message  is  simply marked insecure instead of performing
the
              many hashing iterations. The list must be in ascending order
and
              have  at least one entry. If you set it to "1024 65535" there
is
              no restriction to NSEC3 iteration values.  This  table  must
be
              kept short; a very long list could cause slower operation.

       add-holddown: <seconds>
              Instruct  the auto-trust-anchor-file probe mechanism for
RFC5011
              autotrust updates to add new trust anchors only after they
have
              been visible for this time.  Default is 30 days as per the
RFC.

       del-holddown: <seconds>
              Instruct  the auto-trust-anchor-file probe mechanism for
RFC5011
```

```
              autotrust updates to remove revoked  trust  anchors  after
they
              have been kept in the revoked list for this long.  Default is
30
              days as per the RFC.

       keep-missing: <seconds>
              Instruct the auto-trust-anchor-file probe mechanism for
RFC5011
              autotrust  updates  to  remove  missing trust anchors after
they
              have been unseen for this long.  This cleans up the  state
file
              if  the target zone does not perform trust anchor revocation,
so
              this makes the auto probe mechanism work with zones that
perform
              regular  (non-5011)  rollovers.   The  default is 366 days.
The
              value 0 does not remove missing anchors, as per the RFC.

       permit-small-holddown: <yes or no>
              Debug option that allows the autotrust 5011 rollover  timers
to
              assume very small values.  Default is no.

       key-cache-size: <number>
              Number  of  bytes size of the key cache. Default is 4
megabytes.
              A plain number is in bytes, append 'k', 'm'  or  'g'  for
kilo-
              bytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).

       key-cache-slabs: <number>
              Number  of  slabs in the key cache. Slabs reduce lock
contention
              by threads.  Must be set to a power of 2. Setting (close) to
the
              number of cpus is a reasonable guess.

       neg-cache-size: <number>
              Number  of  bytes size of the aggressive negative cache.
Default
              is 1 megabyte.  A plain number is in bytes, append 'k',  'm'
or
              'g'  for kilobytes, megabytes or gigabytes (1024*1024 bytes in
a
              megabyte).

       unblock-lan-zones: <yesno>
```

```
              Default is disabled.   If  enabled,  then  for  private
address
              space,  the reverse lookups are no longer filtered.  This
allows
              unbound when running as dns service on a host where it
provides
              service  for  that  host,  to put out all of the queries for
the
              'lan' upstream.  When enabled, only localhost, 127.0.0.1
reverse
              and  ::1  reverse zones are configured with default local
zones.
              Disable the option when unbound is running as a (DHCP-) DNS
net-
              work resolver for a group of machines, where such lookups
should
              be filtered (RFC compliance), this  also  stops  potential
data
              leakage about the local network to the upstream DNS servers.

       insecure-lan-zones: <yesno>
              Default  is  disabled.  If enabled, then reverse lookups in
pri-
              vate address space are not validated.  This is usually
required
              whenever unblock-lan-zones is used.
```

local-zone

local-zone: <zone> <type>

Configure a local zone. The type determines the answer to give if there is no match from local-data. The types are deny, refuse, static, transparent, redirect, nodefault, typetransparent, inform, inform_deny, and are explained below. After that the default settings are listed. Use local-data: to enter data into the local zone. Answers for local zones are authoritative DNS answers. By default the zones are class IN.
If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below.

deny

Do not send an answer, drop the query. If there is a match from local data, the query is answered.

refuse

Send an error message reply, with rcode REFUSED. If there is a match from local data, the query is answered.

static

If there is a match from local data, the query is answered. Otherwise, the query is answered with nodata or nxdomain. For a negative answer a SOA is included in the answer if present as local-data for the zone apex domain.

transparent
: If there is a match from local data, the query is answered. Otherwise if the query has a different name, the query is resolved normally. If the query is for a name given in localdata but no such type of data is given in localdata, then a noerror nodata answer is returned. If no local-zone is given local-data causes a transparent zone to be created by default.

typetransparent
: If there is a match from local data, the query is answered. If the query is for a different name, or for the same name but for a different type, the query is resolved normally. So, similar to transparent but types that are not listed in local data are resolved normally, so if an A record is in the local data that does not cause a nodata reply for AAAA queries.

redirect
: The query is answered from the local data for the zone name. There may be no local data beneath the zone name. This answers queries for the zone, and all subdomains of the zone with the local data for the zone. It can be used to redirect a domain to return a different address record to the end user, with local-zone: “example.com.” redirect and local-data: “example.com. A 127.0.0.1” queries for www.example.com and www.foo.example.com are redirected, so that users with web browsers cannot access sites with suffix example.com.

inform
: The query is answered normally. The client IP address (@portnumber) is printed to the logfile. The log message is: timestamp, unbound-pid, info: zonename inform IP@port query-name type class. This option can be used for normal resolution, but machines looking up infected names are logged, eg. to run antivirus on them.

inform_deny
: The query is dropped, like 'deny', and logged, like 'inform'. Ie. find infected machines without answering the queries.

nodefault
: Used to turn off default contents for AS112 zones. The other types also turn off default contents for the zone. The 'nodefault' option has no other effect than turning off default contents for the given zone. Use nodefault if you use exactly that zone, if you want to use a subzone, use transparent.

The default zones are localhost, reverse 127.0.0.1 and ::1, the onion and the AS112 zones. The AS112 zones are reverse DNS zones for private use and reserved IP addresses for which the servers on the internet cannot provide correct answers. They are configured by default to give nxdomain (no reverse information) answers. The defaults can be turned off by specifying your own local-zone of that name, or using the 'nodefault' type. Below is a list of the default zone contents.

localhost
: The IP4 and IP6 localhost information is given. NS and SOA records are provided for completeness and to satisfy some DNS update tools. Default content:

```
    local-zone: "localhost." static
    local-data: "localhost. 10800 IN NS localhost."
    local-data: "localhost. 10800 IN SOA localhost.
```

```
nobody.invalid. 1 3600 1200 604800 10800"
    local-data: "localhost. 10800 IN A 127.0.0.1"
    local-data: "localhost. 10800 IN AAAA ::1"
```

reverse IPv4 loopback

Default content:

```
    local-zone: "127.in-addr.arpa." static
    local-data: "127.in-addr.arpa. 10800 IN NS
localhost."
    local-data: "127.in-addr.arpa. 10800 IN SOA
localhost. nobody.invalid. 1 3600 1200 604800 10800"
    local-data: "1.0.0.127.in-addr.arpa. 10800 IN PTR
localhost."
```

reverse IPv6 loopback

Default content:

```
    local-zone: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa." static
    local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                    NS localhost."
    local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                    SOA localhost. nobody.invalid. 1
3600 1200 604800 10800"
    local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                    PTR localhost."
```

onion (RFC 7686)

Default content:

```
    local-zone: "onion." static
    local-data: "onion. 10800 IN NS localhost."
    local-data: "onion. 10800 IN
                    SOA localhost. nobody.invalid. 1
3600 1200 604800 10800"
```

reverse RFC1918 local use zones

Reverse data for zones 10.in-addr.arpa, 16.172.in-addr.arpa to 31.172.in-addr.arpa, 168.192.in-addr.arpa. The local-zone: is set static and as local-data: SOA and NS records are provided.

reverse RFC3330 IP4 this, link-local, testnet and broadcast Reverse data for zones 0.in-addr.arpa, 254.169.in-addr.arpa, 2.0.192.in-addr.arpa (TEST NET 1), 100.51.198.in-addr.arpa TEST NET 2), 113.0.203.in-addr.arpa (TEST NET 3), 255.255.255.255.in-addr.arpa. And from 64.100.in-addr.arpa to 127.100.in-addr.arpa (Shared Address Space).

reverse RFC4291 IP6 unspecified

Reverse data for zone

```
                    0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa.
```

reverse RFC4193 IPv6 Locally Assigned Local Addresses
: Reverse data for zone D.F.ip6.arpa.

reverse RFC4291 IPv6 Link Local Addresses
: Reverse data for zones 8.E.F.ip6.arpa to B.E.F.ip6.arpa.

reverse IPv6 Example Prefix
: Reverse data for zone 8.B.D.0.1.0.0.2.ip6.arpa. This zone is used for tutorials and examples. You can remove the block on this zone with:

```
    local-zone: 8.B.D.0.1.0.0.2.ip6.arpa. nodefault
```

You can also selectively unblock a part of the zone by making that part transparent with a local-zone statement. This also works with the other default zones.

local-data

local-data: “<resource record string>”
: Configure local data, which is served in reply to queries for it. The query has to match exactly unless you configure the local-zone as redirect. If not matched exactly, the local-zone type determines further processing. If local-data is configured that is not a subdomain of a local-zone, a transparent local-zone is configured. For record types such as TXT, use single quotes, as in

```
            local-data: 'example. TXT "text"'.
```

If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below.

local-data-ptr: “IPaddr name”
: Configure local data shorthand for a PTR record with the reversed IPv4 or IPv6 address and the host name. For example “192.0.2.4 www.example.com”. TTL can be inserted like this: 2001:DB8::4 7200 www.example.com“

```
       ratelimit: <number or 0>
            Enable ratelimiting of queries sent to nameserver  for
performing
            recursion.   If  0,  the  default, it is disabled.  This option
is
            experimental at this time.  The ratelimit is in queries per
second
            that  are  allowed.   More  queries  are turned away with an
error
            (servfail).  This stops recursive floods, eg. random query
names,
            but not spoofed reflection floods.  Cached responses are not
rate-
```

```
            limited by this setting.  The zone of the query is  determined
by
            examining  the  nameservers  for it, the zone name is used to
keep
            track of the rate.  For example, 1000 may be a suitable  value
to
            stop the server from being overloaded with random names, and
keeps
            unbound from sending traffic to the nameservers for those zones.

       ratelimit-size: <memory size>
            Give the size of the data structure in which the  current
ongoing
            rates  are  kept  track in.  Default 4m.  In bytes or use
m(mega),
            k(kilo), g(giga).  The ratelimit structure is small, so this
data
            structure likely does not need to be large.

       ratelimit-slabs: <number>
            Give  power of 2 number of slabs, this is used to reduce lock
con-
            tention in the ratelimit tracking data structure.   Close  to
the
            number of cpus is a fairly good setting.

       ratelimit-factor: <number>
            Set  the  amount  of  queries  to  rate  limit  when  the limit
is
            exceeded.  If set to 0, all queries are dropped for domains
where
            the  limit is exceeded.  If set to another value, 1 in that
number
            is allowed through to complete.   Default  is  10,  allowing
1/10
            traffic to flow normally.  This can make ordinary queries
complete
            (if repeatedly queried for), and enter the cache, whilst also
mit-
            igating the traffic flow by the factor given.

       ratelimit-for-domain: <domain> <number qps>
            Override  the global ratelimit for an exact match domain name
with
            the listed number.  You can give this for  any  number  of
names.
            For  example, for a top-level-domain you may want to have a
higher
            limit than other names.

       ratelimit-below-domain: <domain> <number qps>
```

```
            Override the global ratelimit for a domain name that ends in
this
            name.  You can give this multiple times, it then describes
differ-
            ent settings in different parts of  the  namespace.   The
closest
            matching  suffix is used to determine the qps limit.  The rate
for
            the  exact  matching  domain  name  is  not  changed,  use
rate-
            limit-for-domain to set that, you might want to use different
set-
            tings for a top-level-domain and subdomains.
```

Remote Control Options

Stub Zone Options

Forward Zone Options

Python Module Options

DNS64 Module Options

MEMORY CONTROL EXAMPLE

FILES

SEE ALSO

AUTHORS

Server Options

These options are part of the server: clause.

verbosity: <number>
The verbosity number, level 0 means no verbosity, only errors.

- Level 1 gives operational information.

- Level 2 gives detailed operational information.
- Level 3 gives query level information, output per query.
- Level 4 gives algorithm level information.
- Level 5 logs client identification for cache misses.
- Default is level 1. The verbosity can also be increased from the command-line, see unbound(8).

statistics-interval: <seconds>

The number of seconds between printing statistics to the log for every thread. Disable with value 0 or ””. Default is disabled.
The histogram statistics are only printed if replies were sent during the statistics interval, requestlist statistics are printed for every interval (but can be 0). This is because the median calculation requires data to be present.

statistics-cumulative: <yes or no> If enabled, statistics are cumulative since starting unbound, without clearing the statistics counters after logging the sta- tistics. Default is no. extended-statistics: <yes or no> If enabled, extended statistics are printed from unbound-con- trol(8). Default is off, because keeping track of more statis- tics takes time. The counters are listed in unbound-control(8). num-threads: <number> The number of threads to create to serve clients. Use 1 for no threading. port: <port number> The port number, default 53, on which the server responds to queries. interface: <ip address[@port]> Interface to use to connect to the network. This interface is listened to for queries from clients, and answers to clients are given from it. Can be given multiple times to work on several interfaces. If none are given the default is to listen to local- host. The interfaces are not changed on a reload (kill -HUP) but only on restart. A port number can be specified with @port (without spaces between interface and port number), if not spec- ified the default port (from port) is used. ip-address: <ip address[@port]> Same as interface: (for easy of compatibility with nsd.conf). interface-automatic: <yes or no> Detect source interface on UDP queries and copy them to replies. This feature is experimental, and needs support in your OS for particular socket options. Default value is no. outgoing-interface: <ip address> Interface to use to connect to the network. This interface is used to send queries to authoritative servers and receive their replies. Can be given multiple times to work on several inter- faces. If none are given the default (all) is used. You can specify the same interfaces in interface: and outgoing-inter- face: lines, the interfaces are then used for both purposes. Outgoing queries are sent via a random outgoing interface to counter spoofing. outgoing-range: <number> Number of ports to open. This number of file descriptors can be opened per thread. Must be at least 1. Default depends on com- pile options. Larger numbers need extra resources from the oper- ating system. For performance a a very large value is best, use libevent to make this possible. outgoing-port-permit: <port number or range> Permit unbound to open this port or range of ports for use to send queries. A larger number of permitted outgoing ports increases resilience against spoofing attempts. Make sure these ports are not needed by other daemons. By default only ports above 1024 that have not been assigned by IANA are used. Give a port number or a range of the form "low-high", without spaces. The outgoing-port-permit and outgoing-port-avoid statements are processed in the line order of the config file, adding the per- mitted ports and subtracting the avoided ports from the set of allowed ports. The processing starts with the non IANA allo- cated ports above 1024 in the set of allowed ports. outgoing-port-avoid: <port number or range> Do not permit unbound to open this port or range of ports for use to send queries. Use this to make sure unbound does not grab a port that another daemon needs. The port is avoided on all outgoing interfaces, both IP4 and IP6. By default only ports above 1024 that have not been assigned by IANA are used. Give a port number or a range of the form "low-high", without spaces. outgoing-num-tcp: <number> Number of outgoing TCP buffers to allocate per thread. Default is 10. If set to 0, or if do-tcp is "no", no TCP

queries to authoritative servers are done. For larger installations increasing this value is a good idea. incoming-num-tcp: <number> Number of incoming TCP buffers to allocate per thread. Default is 10. If set to 0, or if do-tcp is "no", no TCP queries from clients are accepted. For larger installations increasing this value is a good idea. edns-buffer-size: <number> Number of bytes size to advertise as the EDNS reassembly buffer size. This is the value put into datagrams over UDP towards peers. The actual buffer size is determined by msg-buffer-size (both for TCP and UDP). Do not set higher than that value. Default is 4096 which is RFC recommended. If you have fragmen- tation reassembly problems, usually seen as timeouts, then a value of 1480 can fix it. Setting to 512 bypasses even the most stringent path MTU problems, but is seen as extreme, since the amount of TCP fallback generated is excessive (probably also for this resolver, consider tuning the outgoing tcp number). max-udp-size: <number> Maximum UDP response size (not applied to TCP response). 65536 disables the udp response size maximum, and uses the choice from the client, always. Suggested values are 512 to 4096. Default is 4096. msg-buffer-size: <number> Number of bytes size of the message buffers. Default is 65552 bytes, enough for 64 Kb packets, the maximum DNS message size. No message larger than this can be sent or received. Can be reduced to use less memory, but some requests for DNS data, such as for huge resource records, will result in a SERVFAIL reply to the client. msg-cache-size: <number> Number of bytes size of the message cache. Default is 4 megabytes. A plain number is in bytes, append 'k', 'm' or 'g' for kilobytes, megabytes or gigabytes (1024*1024 bytes in a megabyte). msg-cache-slabs: <number> Number of slabs in the message cache. Slabs reduce lock con- tention by threads. Must be set to a power of 2. Setting (close) to the number of cpus is a reasonable guess. num-queries-per-thread: <number> The number of queries that every thread will service simultane- ously. If more queries arrive that need servicing, and no queries can be jostled out (see jostle-timeout), then the queries are dropped. This forces the client to resend after a timeout; allowing the server time to work on the existing queries. Default depends on compile options, 512 or 1024. jostle-timeout: <msec> Timeout used when the server is very busy. Set to a value that usually results in one roundtrip to the authority servers. If too many queries arrive, then 50% of the queries are allowed to run to completion, and the other 50% are replaced with the new incoming query if they have already spent more than their allowed time. This protects against denial of service by slow queries or high query rates. Default 200 milliseconds. The effect is that the qps for long-lasting queries is about (num- queriesperthread / 2) / (average time for such long queries) qps. The qps for short queries can be about (numqueries- perthread / 2) / (jostletimeout in whole seconds) qps per thread, about (1024/2)*5 = 2560 qps by default. delay-close: <msec> Extra delay for timeouted UDP ports before they are closed, in msec. Default is 0, and that disables it. This prevents very delayed answer packets from the upstream (recursive) servers from bouncing against closed ports and setting off all sort of close-port counters, with eg. 1500 msec. When timeouts happen you need extra sockets, it checks the ID and remote IP of pack- ets, and unwanted packets are added to the unwanted packet counter. so-rcvbuf: <number> If not 0, then set the SO_RCVBUF socket option to get more buf- fer space on UDP port 53 incoming queries. So that short spikes on busy servers do not drop packets (see counter in netstat -su). Default is 0 (use system value). Otherwise, the number of bytes to ask for, try "4m" on a busy server. The OS caps it at a maximum, on linux unbound needs root permission to bypass the limit, or the admin can use sysctl net.core.rmem_max. On BSD change kern.ipc.maxsockbuf in /etc/sysctl.conf. On OpenBSD change header and recompile kernel. On Solaris ndd -set /dev/udp udp_max_buf 8388608. so-sndbuf: <number> If not 0, then set the SO_SNDBUF socket option to get more buf- fer space on UDP port 53 outgoing queries. This for very busy servers handles spikes in answer traffic, otherwise 'send: resource temporarily unavailable' can get logged, the buffer overrun is also visible by netstat -su. Default is 0 (use sys- tem value). Specify the number of bytes to ask for, try "4m" on a very busy server. The OS caps it at a maximum, on linux unbound needs root permission to bypass the limit, or the admin can use sysctl net.core.wmem_max. On BSD, Solaris changes are similar to so-rcvbuf. so-reuseport: <yes or no> If yes, then open dedicated listening sockets for incoming queries for each thread and try to set the SO_REUSEPORT socket option

on each socket. May distribute incoming queries to threads more evenly. Default is no. On Linux it is supported in kernels >= 3.9. On other systems, FreeBSD, OSX it may also work. You can enable it (on any platform and kernel), it then attempts to open the port and passes the option if it was avail- able at compile time, if that works it is used, if it fails, it continues silently (unless verbosity 3) without the option. ip-transparent: <yes or no> If yes, then use IP_TRANSPARENT socket option on sockets where unbound is listening for incoming traffic. Default no. Allows you to bind to non-local interfaces. For example for non-exis- tant IP addresses that are going to exist later on, with host failover configuration. This is a lot like interface-automatic, but that one services all interfaces and with this option you can select which (future) interfaces unbound provides service on. This option needs unbound to be started with root permis- sions on some systems. The option uses IP_BINDANY on FreeBSD systems. rrset-cache-size: <number> Number of bytes size of the RRset cache. Default is 4 megabytes. A plain number is in bytes, append 'k', 'm' or 'g' for kilo- bytes, megabytes or gigabytes (1024*1024 bytes in a megabyte). rrset-cache-slabs: <number> Number of slabs in the RRset cache. Slabs reduce lock contention by threads. Must be set to a power of 2. cache-max-ttl: <seconds> Time to live maximum for RRsets and messages in the cache. Default is 86400 seconds (1 day). If the maximum kicks in, responses to clients still get decrementing TTLs based on the original (larger) values. When the internal TTL expires, the cache item has expired. Can be set lower to force the resolver to query for data often, and not trust (very large) TTL values. cache-min-ttl: <seconds> Time to live minimum for RRsets and messages in the cache. Default is 0. If the minimum kicks in, the data is cached for longer than the domain owner intended, and thus less queries are made to look up the data. Zero makes sure the data in the cache is as the domain owner intended, higher values, especially more than an hour or so, can lead to trouble as the data in the cache does not match up with the actual data any more. cache-max-negative-ttl: <seconds> Time to live maximum for negative responses, these have a SOA in the authority section that is limited in time. Default is 3600. infra-host-ttl: <seconds> Time to live for entries in the host cache. The host cache con- tains roundtrip timing, lameness and EDNS support information. Default is 900. infra-cache-slabs: <number> Number of slabs in the infrastructure cache. Slabs reduce lock contention by threads. Must be set to a power of 2. infra-cache-numhosts: <number> Number of hosts for which information is cached. Default is 10000. infra-cache-min-rtt: <msec> Lower limit for dynamic retransmit timeout calculation in infra- structure cache. Default is 50 milliseconds. Increase this value if using forwarders needing more time to do recursive name reso- lution. do-ip4: <yes or no> Enable or disable whether ip4 queries are answered or issued. Default is yes. do-ip6: <yes or no> Enable or disable whether ip6 queries are answered or issued. Default is yes. If disabled, queries are not answered on IPv6, and queries are not sent on IPv6 to the internet nameservers. With this option you can disable the ipv6 transport for sending DNS traffic, it does not impact the contents of the DNS traffic, which may have ip4 and ip6 addresses in it. do-udp: <yes or no> Enable or disable whether UDP queries are answered or issued. Default is yes. do-tcp: <yes or no> Enable or disable whether TCP queries are answered or issued. Default is yes. tcp-mss: <number> Maximum segment size (MSS) of TCP socket on which the server responds to queries. Value lower than common MSS on Ethernet (1220 for example) will address path MTU problem. Note that not all platform supports socket option to set MSS (TCP_MAXSEG). Default is system default MSS determined by interface MTU and negotiation between server and client. outgoing-tcp-mss: <number> Maximum segment size (MSS) of TCP socket for outgoing queries (from Unbound to other servers). Value lower than common MSS on Ethernet (1220 for example) will address path MTU problem. Note that not all platform supports socket option to set MSS (TCP_MAXSEG). Default is system default MSS determined by interface MTU and negotiation between Unbound and other servers. tcp-upstream: <yes or no> Enable or disable whether the upstream queries use TCP only for transport. Default is no. Useful in tunneling scenarios. ssl-upstream: <yes or no> Enabled or disable whether the upstream queries use SSL only for transport. Default is no. Useful in tunneling scenarios. The SSL contains plain DNS in TCP wireformat. The other server must support this (see ssl-service-key). ssl-service-key: <file> If enabled, the server provider SSL service on its TCP sockets. The clients have to use ssl-upstream: yes. The file is the pri- vate key

for the TLS session. The public certificate is in the ssl-service-pem file. Default is "", turned off. Requires a restart (a reload is not enough) if changed, because the private key is read while root permissions are held and before chroot (if any). Normal DNS TCP service is not provided and gives errors, this service is best run with a different port: config or @port suffixes in the interface config. ssl-service-pem: <file> The public key certificate pem file for the ssl service. Default is "", turned off. ssl-port: <number> The port number on which to provide TCP SSL service, default 853, only interfaces configured with that port number as @number get the SSL service. do-daemonize: <yes or no> Enable or disable whether the unbound server forks into the background as a daemon. Default is yes. access-control: <IP netblock> <action> The netblock is given as an IP4 or IP6 address with /size appended for a classless network block. The action can be deny, refuse, allow, allow_snoop, deny_non_local or refuse_non_local. The most specific netblock match is used, if none match deny is used. The action deny stops queries from hosts from that netblock. The action refuse stops queries too, but sends a DNS rcode REFUSED error message back. The action allow gives access to clients from that netblock. It gives only access for recursion clients (which is what almost all clients need). Nonrecursive queries are refused. The allow action does allow nonrecursive queries to access the local-data that is configured. The reason is that this does not involve the unbound server recursive lookup algorithm, and static data is served in the reply. This supports normal opera- tions where nonrecursive queries are made for the authoritative data. For nonrecursive queries any replies from the dynamic cache are refused. The action allow_snoop gives nonrecursive access too. This give both recursive and non recursive access. The name allow_snoop refers to cache snooping, a technique to use nonrecursive queries to examine the cache contents (for malicious acts). However, nonrecursive queries can also be a valuable debugging tool (when you want to examine the cache contents). In that case use allow_snoop for your administration host. By default only localhost is allowed, the rest is refused. The default is refused, because that is protocol-friendly. The DNS protocol is not designed to handle dropped packets due to pol- icy, and dropping may result in (possibly excessive) retried queries. The deny_non_local and refuse_non_local settings are for hosts that are only allowed to query for the authoritative local-data, they are not allowed full recursion but only the static data. With deny_non_local, messages that are disallowed are dropped, with refuse_non_local they receive error code REFUSED. chroot: <directory> If chroot is enabled, you should pass the configfile (from the commandline) as a full path from the original root. After the chroot has been performed the now defunct portion of the config file path is removed to be able to reread the config after a reload. All other file paths (working dir, logfile, roothints, and key files) can be specified in several ways: as an absolute path relative to the new root, as a relative path to the working directory, or as an absolute path relative to the original root. In the last case the path is adjusted to remove the unused por- tion. The pidfile can be either a relative path to the working direc- tory, or an absolute path relative to the original root. It is written just prior to chroot and dropping permissions. This allows the pidfile to be /var/run/unbound.pid and the chroot to be /var/unbound, for example. Additionally, unbound may need to access /dev/random (for entropy) from inside the chroot. If given a chroot is done to the given directory. The default is "/usr/local/etc/unbound". If you give "" no chroot is performed. username: <name> If given, after binding the port the user privileges are dropped. Default is "unbound". If you give username: "" no user change is performed. If this user is not capable of binding the port, reloads (by signal HUP) will still retain the opened ports. If you change the port number in the config file, and that new port number requires privileges, then a reload will fail; a restart is needed. directory: <directory> Sets the working directory for the program. Default is "/usr/local/etc/unbound". On Windows the string "%EXECUTABLE%" tries to change to the directory that unbound.exe resides in. logfile: <filename> If "" is given, logging goes to stderr, or nowhere once daemo- nized. The logfile is appended to, in the following format: [seconds since 1970] unbound[pid:tid]: type: message. If this option is given, the use-syslog is option is set to "no". The logfile is reopened (for append) when the config file is reread, on SIGHUP. use-syslog: <yes or no> Sets unbound to send log messages to the syslogd, using sys- log(3). The log facility LOG_DAEMON is used, with identity "unbound". The logfile

setting is overridden when use-syslog is turned on. The default is to log to syslog. log-time-ascii: <yes or no> Sets logfile lines to use a timestamp in UTC ascii. Default is no, which prints the seconds since 1970 in brackets. No effect if using syslog, in that case syslog formats the timestamp printed into the log files. log-queries: <yes or no> Prints one line per query to the log, with the log timestamp and IP address, name, type and class. Default is no. Note that it takes time to print these lines which makes the server (signifi- cantly) slower. Odd (nonprintable) characters in names are printed as '?'. pidfile: <filename> The process id is written to the file. Default is "/usr/local/etc/unbound/unbound.pid". So, kill -HUP `cat /usr/local/etc/unbound/unbound.pid` triggers a reload, kill -TERM `cat /usr/local/etc/unbound/unbound.pid` gracefully terminates. root-hints: <filename> Read the root hints from this file. Default is nothing, using builtin hints for the IN class. The file has the format of zone files, with root nameserver names and addresses only. The default may become outdated, when servers change, therefore it is good practice to use a root-hints file. hide-identity: <yes or no> If enabled id.server and hostname.bind queries are refused. identity: <string> Set the identity to report. If set to "", the default, then the hostname of the server is returned. hide-version: <yes or no> If enabled version.server and version.bind queries are refused. version: <string> Set the version to report. If set to "", the default, then the package version is returned. target-fetch-policy: <"list of numbers"> Set the target fetch policy used by unbound to determine if it should fetch nameserver target addresses opportunistically. The policy is described per dependency depth. The number of values determines the maximum dependency depth that unbound will pursue in answering a query. A value of -1 means to fetch all targets opportunistically for that dependency depth. A value of 0 means to fetch on demand only. A positive value fetches that many targets opportunistically. Enclose the list between quotes ("") and put spaces between num- bers. The default is "3 2 1 0 0". Setting all zeroes, "0 0 0 0 0" gives behaviour closer to that of BIND 9, while setting "-1 -1 -1 -1 -1" gives behaviour rumoured to be closer to that of BIND 8. harden-short-bufsize: <yes or no> Very small EDNS buffer sizes from queries are ignored. Default is off, since it is legal protocol wise to send these, and unbound tries to give very small answers to these queries, where possible. harden-large-queries: <yes or no> Very large queries are ignored. Default is off, since it is legal protocol wise to send these, and could be necessary for operation if TSIG or EDNS payload is very large. harden-glue: <yes or no> Will trust glue only if it is within the servers authority. Default is on. harden-dnssec-stripped: <yes or no> Require DNSSEC data for trust-anchored zones, if such data is absent, the zone becomes bogus. If turned off, and no DNSSEC data is received (or the DNSKEY data fails to validate), then the zone is made insecure, this behaves like there is no trust anchor. You could turn this off if you are sometimes behind an intrusive firewall (of some sort) that removes DNSSEC data from packets, or a zone changes from signed to unsigned to badly signed often. If turned off you run the risk of a downgrade attack that disables security for a zone. Default is on. harden-below-nxdomain: <yes or no> From draft-vixie-dnsext-resimprove, returns nxdomain to queries for a name below another name that is already known to be nxdo- main. DNSSEC mandates noerror for empty nonterminals, hence this is possible. Very old software might return nxdomain for empty nonterminals (that usually happen for reverse IP address lookups), and thus may be incompatible with this. To try to avoid this only DNSSEC-secure nxdomains are used, because the old software does not have DNSSEC. Default is off. harden-referral-path: <yes or no> Harden the referral path by performing additional queries for infrastructure data. Validates the replies if trust anchors are configured and the zones are signed. This enforces DNSSEC vali- dation on nameserver NS sets and the nameserver addresses that are encountered on the referral path to the answer. Default off, because it burdens the authority servers, and it is not RFC standard, and could lead to performance problems because of the extra query load that is generated. Experimental option. If you enable it consider adding more numbers after the tar- get-fetch-policy to increase the max depth that is checked to. harden-algo-downgrade: <yes or no> Harden against algorithm downgrade when multiple algorithms are advertised in the DS record. If no, allows the weakest algo- rithm to validate the zone. Default is no. Zone signers must produce zones that allow this feature to work, but sometimes they do not, and turning this option off avoids that validation failure. use-caps-for-id: <yes or no> Use 0x20-encoded random bits in the query to foil

spoof attempts. This perturbs the lowercase and uppercase of query names sent to authority servers and checks if the reply still has the correct casing. Disabled by default. This feature is an experimental implementation of draft dns-0x20. caps-whitelist: <domain> Whitelist the domain so that it does not receive caps-for-id perturbed queries. For domains that do not support 0x20 and also fail with fallback because they keep sending different answers, like some load balancers. Can be given multiple times, for different domains. qname-minimisation: <yes or no> Send minimum amount of information to upstream servers to enhance privacy. Only sent minimum required labels of the QNAME and set QTYPE to NS when possible. Best effort approach, full QNAME and original QTYPE will be sent when upstream replies with a RCODE other than NOERROR. Default is off. private-address: <IP address or subnet> Give IPv4 of IPv6 addresses or classless subnets. These are addresses on your private network, and are not allowed to be returned for public internet names. Any occurrence of such addresses are removed from DNS answers. Additionally, the DNSSEC validator may mark the answers bogus. This protects against so-called DNS Rebinding, where a user browser is turned into a network proxy, allowing remote access through the browser to other parts of your private network. Some names can be allowed to contain your private addresses, by default all the local-data that you configured is allowed to, and you can specify addi- tional names using private-domain. No private addresses are enabled by default. We consider to enable this for the RFC1918 private IP address space by default in later releases. That would enable private addresses for 10.0.0.0/8 172.16.0.0/12 192.168.0.0/16 169.254.0.0/16 fd00::/8 and fe80::/10, since the RFC standards say these addresses should not be visible on the public internet. Turning on 127.0.0.0/8 would hinder many spam-blocklists as they use that. Adding ::ffff:0:0/96 stops IPv4-mapped IPv6 addresses from bypassing the filter. private-domain: <domain name> Allow this domain, and all its subdomains to contain private addresses. Give multiple times to allow multiple domain names to contain private addresses. Default is none. unwanted-reply-threshold: <number> If set, a total number of unwanted replies is kept track of in every thread. When it reaches the threshold, a defensive action is taken and a warning is printed to the log. The defensive action is to clear the rrset and message caches, hopefully flushing away any poison. A value of 10 million is suggested. Default is 0 (turned off). do-not-query-address: <IP address> Do not query the given IP address. Can be IP4 or IP6. Append /num to indicate a classless delegation netblock, for example like 10.2.3.4/24 or 2001::11/64. do-not-query-localhost: <yes or no> If yes, localhost is added to the do-not-query-address entries, both IP6 ::1 and IP4 127.0.0.1/8. If no, then localhost can be used to send queries to. Default is yes. prefetch: <yes or no> If yes, message cache elements are prefetched before they expire to keep the cache up to date. Default is no. Turning it on gives about 10 percent more traffic and load on the machine, but popular items do not expire from the cache. prefetch-key: <yes or no> If yes, fetch the DNSKEYs earlier in the validation process, when a DS record is encountered. This lowers the latency of requests. It does use a little more CPU. Also if the cache is set to 0, it is no use. Default is no. rrset-roundrobin: <yes or no> If yes, Unbound rotates RRSet order in response (the random num- ber is taken from the query ID, for speed and thread safety). Default is no. minimal-responses: <yes or no> If yes, Unbound doesn't insert authority/additional sections into response messages when those sections are not required. This reduces response size significantly, and may avoid TCP fallback for some responses. This may cause a slight speedup. The default is no, because the DNS protocol RFCs mandate these sections, and the additional content could be of use and save roundtrips for clients. module-config: <"module names"> Module configuration, a list of module names separated by spa- ces, surround the string with quotes (""). The modules can be validator, iterator. Setting this to "iterator" will result in a non-validating server. Setting this to "validator iterator" will turn on DNSSEC validation. The ordering of the modules is important. You must also set trust-anchors for validation to be useful. trust-anchor-file: <filename> File with trusted keys for validation. Both DS and DNSKEY entries can appear in the file. The format of the file is the standard DNS Zone file format. Default is "", or no trust anchor file. auto-trust-anchor-file: <filename> File with trust anchor for one zone, which is tracked with RFC5011 probes. The probes are several times per month, thus the machine must be online frequently. The initial file can

be one with contents as described in trust-anchor-file. The file is written to when the anchor is updated, so the unbound user must have write permission. trust-anchor: <"Resource Record"> A DS or DNSKEY RR for a key to use for validation. Multiple entries can be given to specify multiple trusted keys, in addi- tion to the trust-anchor-files. The resource record is entered in the same format as 'dig' or 'drill' prints them, the same format as in the zone file. Has to be on a single line, with "" around it. A TTL can be specified for ease of cut and paste, but is ignored. A class can be specified, but class IN is default. trusted-keys-file: <filename> File with trusted keys for validation. Specify more than one file with several entries, one file per entry. Like trust-anchor-file but has a different file format. Format is BIND-9 style format, the trusted-keys { name flag proto algo "key"; }; clauses are read. It is possible to use wildcards with this statement, the wildcard is expanded on start and on reload. dlv-anchor-file: <filename> This option was used during early days DNSSEC deployment when no parent-side DS record registrations were easily available. Nowadays, it is best to have DS records registered with the par- ent zone (many top level zones are signed). File with trusted keys for DLV (DNSSEC Lookaside Validation). Both DS and DNSKEY entries can be used in the file, in the same format as for trust-anchor-file: statements. Only one DLV can be configured, more would be slow. The DLV configured is used as a root trusted DLV, this means that it is a lookaside for the root. Default is "", or no dlv anchor file. DLV is going to be decommissioned. Please do not use it any more. dlv-anchor: <"Resource Record"> Much like trust-anchor, this is a DLV anchor with the DS or DNSKEY inline. DLV is going to be decommissioned. Please do not use it any more. domain-insecure: <domain name> Sets domain name to be insecure, DNSSEC chain of trust is ignored towards the domain name. So a trust anchor above the domain name can not make the domain secure with a DS record, such a DS record is then ignored. Also keys from DLV are ignored for the domain. Can be given multiple times to specify multiple domains that are treated as if unsigned. If you set trust anchors for the domain they override this setting (and the domain is secured). This can be useful if you want to make sure a trust anchor for external lookups does not affect an (unsigned) internal domain. A DS record externally can create validation failures for that internal domain. val-override-date: <rrsig-style date spec> Default is "" or "0", which disables this debugging feature. If enabled by giving a RRSIG style date, that date is used for ver- ifying RRSIG inception and expiration dates, instead of the cur- rent date. Do not set this unless you are debugging signature inception and expiration. The value -1 ignores the date alto-gether, useful for some special applications. val-sig-skew-min: <seconds> Minimum number of seconds of clock skew to apply to validated signatures. A value of 10% of the signature lifetime (expira- tion - inception) is used, capped by this setting. Default is 3600 (1 hour) which allows for daylight savings differences. Lower this value for more strict checking of short lived signa- tures. val-sig-skew-max: <seconds> Maximum number of seconds of clock skew to apply to validated signatures. A value of 10% of the signature lifetime (expira- tion - inception) is used, capped by this setting. Default is 86400 (24 hours) which allows for timezone setting problems in stable domains. Setting both min and max very low disables the clock skew allowances. Setting both min and max very high makes the validator check the signature timestamps less strictly. val-bogus-ttl: <number> The time to live for bogus data. This is data that has failed validation; due to invalid signatures or other checks. The TTL from that data cannot be trusted, and this value is used instead. The value is in seconds, default 60. The time interval prevents repeated revalidation of bogus data. val-clean-additional: <yes or no> Instruct the validator to remove data from the additional sec- tion of secure messages that are not signed properly. Messages that are insecure, bogus, indeterminate or unchecked are not affected. Default is yes. Use this setting to protect the users that rely on this validator for authentication from potentially bad data in the additional section. val-log-level: <number> Have the validator print validation failures to the log. Regardless of the verbosity setting. Default is 0, off. At 1, for every user query that fails a line is printed to the logs. This way you can monitor what happens with validation. Use a diagnosis tool, such as dig or drill, to find out why validation is failing for these queries. At 2, not only the query that failed is printed but also the reason why unbound thought it was wrong and which server sent the faulty data. val-permissive-mode: <yes or no> Instruct the validator to mark bogus messages as indeterminate. The security checks are

performed, but if the result is bogus (failed security), the reply is not withheld from the client with SERVFAIL as usual. The client receives the bogus data. For messages that are found to be secure the AD bit is set in replies. Also logging is performed as for full validation. The default value is "no". ignore-cd-flag: <yes or no> Instruct unbound to ignore the CD flag from clients and refuse to return bogus answers to them. Thus, the CD (Checking Dis- abled) flag does not disable checking any more. This is useful if legacy (w2008) servers that set the CD flag but cannot vali- date DNSSEC themselves are the clients, and then unbound pro- vides them with DNSSEC protection. The default value is "no". val-nsec3-keysize-iterations: <"list of values"> List of keysize and iteration count values, separated by spaces, surrounded by quotes. Default is "1024 150 2048 500 4096 2500". This determines the maximum allowed NSEC3 iteration count before a message is simply marked insecure instead of performing the many hashing iterations. The list must be in ascending order and have at least one entry. If you set it to "1024 65535" there is no restriction to NSEC3 iteration values. This table must be kept short; a very long list could cause slower operation. add-holddown: <seconds> Instruct the auto-trust-anchor-file probe mechanism for RFC5011 autotrust updates to add new trust anchors only after they have been visible for this time. Default is 30 days as per the RFC. del-holddown: <seconds> Instruct the auto-trust-anchor-file probe mechanism for RFC5011 autotrust updates to remove revoked trust anchors after they have been kept in the revoked list for this long. Default is 30 days as per the RFC. keep-missing: <seconds> Instruct the auto-trust-anchor-file probe mechanism for RFC5011 autotrust updates to remove missing trust anchors after they have been unseen for this long. This cleans up the state file if the target zone does not perform trust anchor revocation, so this makes the auto probe mechanism work with zones that perform regular (non-5011) rollovers. The default is 366 days. The value 0 does not remove missing anchors, as per the RFC. permit-small-holddown: <yes or no> Debug option that allows the autotrust 5011 rollover timers to assume very small values. Default is no. key-cache-size: <number> Number of bytes size of the key cache. Default is 4 megabytes. A plain number is in bytes, append 'k', 'm' or 'g' for kilo- bytes, megabytes or gigabytes (1024*1024 bytes in a megabyte). key-cache-slabs: <number> Number of slabs in the key cache. Slabs reduce lock contention by threads. Must be set to a power of 2. Setting (close) to the number of cpus is a reasonable guess. neg-cache-size: <number> Number of bytes size of the aggressive negative cache. Default is 1 megabyte. A plain number is in bytes, append 'k', 'm' or 'g' for kilobytes, megabytes or gigabytes (1024*1024 bytes in a megabyte). unblock-lan-zones: <yesno> Default is disabled. If enabled, then for private address space, the reverse lookups are no longer filtered. This allows unbound when running as dns service on a host where it provides service for that host, to put out all of the queries for the 'lan' upstream. When enabled, only localhost, 127.0.0.1 reverse and ::1 reverse zones are configured with default local zones. Disable the option when unbound is running as a (DHCP-) DNS net- work resolver for a group of machines, where such lookups should be filtered (RFC compliance), this also stops potential data leakage about the local network to the upstream DNS servers. insecure-lan-zones: <yesno> Default is disabled. If enabled, then reverse lookups in pri- vate address space are not validated. This is usually required whenever unblock-lan-zones is used. local-zone: <zone> <type> Configure a local zone. The type determines the answer to give if there is no match from local-data. The types are deny, refuse, static, transparent, redirect, nodefault, typetranspar- ent, inform, inform_deny, and are explained below. After that the default settings are listed. Use local-data: to enter data into the local zone. Answers for local zones are authoritative DNS answers. By default the zones are class IN. If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below. deny Do not send an answer, drop the query. If there is a match from local data, the query is answered. refuse Send an error message reply, with rcode REFUSED. If there is a match from local data, the query is answered. static If there is a match from local data, the query is answered. Otherwise, the query is answered with nodata or nxdomain. For a negative answer a SOA is included in the answer if present as local-data for the zone apex domain. transparent If there is a match from local data, the query is answered. Otherwise if the

query has a different name, the query is resolved normally. If the query is for a name given in localdata but no such type of data is given in localdata, then a noerror nodata answer is returned. If no local-zone is given local-data causes a transparent zone to be created by default. typetransparent If there is a match from local data, the query is answered. If the query is for a different name, or for the same name but for a different type, the query is resolved normally. So, similar to transparent but types that are not listed in local data are resolved normally, so if an A record is in the local data that does not cause a nodata reply for AAAA queries. redirect The query is answered from the local data for the zone name. There may be no local data beneath the zone name. This answers queries for the zone, and all subdomains of the zone with the local data for the zone. It can be used to redirect a domain to return a different address record to the end user, with local-zone: "example.com." redirect and local-data: "example.com. A 127.0.0.1" queries for www.exam- ple.com and www.foo.example.com are redirected, so that users with web browsers cannot access sites with suffix exam- ple.com. inform The query is answered normally. The client IP address (@portnumber) is printed to the logfile. The log message is: timestamp, unbound-pid, info: zonename inform IP@port query- name type class. This option can be used for normal resolu- tion, but machines looking up infected names are logged, eg. to run antivirus on them. inform_deny The query is dropped, like 'deny', and logged, like 'inform'. Ie. find infected machines without answering the queries. nodefault Used to turn off default contents for AS112 zones. The other types also turn off default contents for the zone. The 'node- fault' option has no other effect than turning off default contents for the given zone. Use nodefault if you use exactly that zone, if you want to use a subzone, use trans- parent. The default zones are localhost, reverse 127.0.0.1 and ::1, the onion and the AS112 zones. The AS112 zones are reverse DNS zones for private use and reserved IP addresses for which the servers on the internet cannot provide correct answers. They are configured by default to give nxdomain (no reverse information) answers. The defaults can be turned off by specifying your own local-zone of that name, or using the 'node- fault' type. Below is a list of the default zone contents. localhost The IP4 and IP6 localhost information is given. NS and SOA records are provided for completeness and to satisfy some DNS update tools. Default content: local-zone: "localhost." static local-data: "localhost. 10800 IN NS localhost." local-data: "localhost. 10800 IN SOA localhost. nobody.invalid. 1 3600 1200 604800 10800" local-data: "localhost. 10800 IN A 127.0.0.1" local-data: "localhost. 10800 IN AAAA ::1" reverse IPv4 loopback Default content: local-zone: "127.in-addr.arpa." static local-data: "127.in-addr.arpa. 10800 IN NS localhost." local-data: "127.in-addr.arpa. 10800 IN SOA localhost. nobody.invalid. 1 3600 1200 604800 10800" local-data: "1.0.0.127.in-addr.arpa. 10800 IN PTR localhost." reverse IPv6 loopback Default content: local-zone: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0. 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa." static local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0. 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN NS localhost." local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0. 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN SOA localhost. nobody.invalid. 1 3600 1200 604800 10800" local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0. 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN PTR localhost." onion (RFC 7686) Default content: local-zone: "onion." static local-data: "onion. 10800 IN NS localhost." local-data: "onion. 10800 IN SOA localhost. nobody.invalid. 1 3600 1200 604800 10800" reverse RFC1918 local use zones Reverse data for zones 10.in-addr.arpa, 16.172.in-addr.arpa to 31.172.in-addr.arpa, 168.192.in-addr.arpa. The local-zone: is set static and as local-data: SOA and NS records are provided. reverse RFC3330 IP4 this, link-local, testnet and broadcast Reverse data for zones 0.in-addr.arpa, 254.169.in-addr.arpa, 2.0.192.in-addr.arpa (TEST NET 1), 100.51.198.in-addr.arpa (TEST NET 2), 113.0.203.in-addr.arpa (TEST NET 3), 255.255.255.255.in-addr.arpa. And from 64.100.in-addr.arpa to 127.100.in-addr.arpa (Shared Address Space). reverse RFC4291 IP6 unspecified Reverse data for zone 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0. 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. reverse RFC4193 IPv6 Locally Assigned Local Addresses Reverse data for zone D.F.ip6.arpa. reverse RFC4291 IPv6 Link Local Addresses Reverse data for zones 8.E.F.ip6.arpa to B.E.F.ip6.arpa. reverse IPv6 Example Prefix Reverse data for zone 8.B.D.0.1.0.0.2.ip6.arpa. This zone is used for tutorials and examples. You can remove the block on this zone with: local-zone: 8.B.D.0.1.0.0.2.ip6.arpa. nodefault You can also

selectively unblock a part of the zone by making that part transparent with a local-zone statement. This also works with the other default zones. local-data: "<resource record string>" Configure local data, which is served in reply to queries for it. The query has to match exactly unless you configure the local-zone as redirect. If not matched exactly, the local-zone type deter- mines further processing. If local-data is configured that is not a subdomain of a local-zone, a transparent local-zone is config- ured. For record types such as TXT, use single quotes, as in local-data: 'example. TXT "text"'. If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below. local-data-ptr: "IPaddr name" Configure local data shorthand for a PTR record with the reversed IPv4 or IPv6 address and the host name. For example "192.0.2.4 www.example.com". TTL can be inserted like this: "2001:DB8::4 7200 www.example.com" ratelimit: <number or 0> Enable ratelimiting of queries sent to nameserver for performing recursion. If 0, the default, it is disabled. This option is experimental at this time. The ratelimit is in queries per second that are allowed. More queries are turned away with an error (servfail). This stops recursive floods, eg. random query names, but not spoofed reflection floods. Cached responses are not rate- limited by this setting. The zone of the query is determined by examining the nameservers for it, the zone name is used to keep track of the rate. For example, 1000 may be a suitable value to stop the server from being overloaded with random names, and keeps unbound from sending traffic to the nameservers for those zones. ratelimit-size: <memory size> Give the size of the data structure in which the current ongoing rates are kept track in. Default 4m. In bytes or use m(mega), k(kilo), g(giga). The ratelimit structure is small, so this data structure likely does not need to be large. ratelimit-slabs: <number> Give power of 2 number of slabs, this is used to reduce lock con- tention in the ratelimit tracking data structure. Close to the number of cpus is a fairly good setting. ratelimit-factor: <number> Set the amount of queries to rate limit when the limit is exceeded. If set to 0, all queries are dropped for domains where the limit is exceeded. If set to another value, 1 in that number is allowed through to complete. Default is 10, allowing 1/10 traffic to flow normally. This can make ordinary queries complete (if repeatedly queried for), and enter the cache, whilst also mit- igating the traffic flow by the factor given. ratelimit-for-domain: <domain> <number qps> Override the global ratelimit for an exact match domain name with the listed number. You can give this for any number of names. For example, for a top-level-domain you may want to have a higher limit than other names. ratelimit-below-domain: <domain> <number qps> Override the global ratelimit for a domain name that ends in this name. You can give this multiple times, it then describes differ- ent settings in different parts of the namespace. The closest matching suffix is used to determine the qps limit. The rate for the exact matching domain name is not changed, use rate- limit-for-domain to set that, you might want to use different set- tings for a top-level-domain and subdomains.

(ancien fr)

Voir aussi Exemple de fichier unbound.conf

Le fichier **unbound.conf** est utilisé pour configurer **unbound**. Le format de fichier a des attributs et des valeurs. Certains attributs contiennent des attributs.

La notation est :

```
attribut: valeur
```

.

Les commentaires commencent par # et se terminent à la fin de la ligne.

Les lignes vides sont ignorées tout comme les espaces en début de ligne.

L'utilitaire **unbound-checkconf** peut être utilisé pour vérifier **unbound.conf** avant l'utilisation.

Exemple

Un exemple de fichier de configuration est illustré ci-dessous.

Copiez-le en **/etc/unbound/unbound.conf** et démarrer le serveur avec :

- `unbound -c /etc/unbound/unbound.conf`

La plupart des réglages sont les valeurs par défaut. Arrêtez le serveur avec :

- `kill `cat /etc/unbound/unbound.pid``

Voici ci-dessous un fichier de configuration minimal. La distribution source contient un gros fichier **example.conf** avec toutes les options.

unbound.conf

```
# fichier de configuration unbound.conf pour unbound.
server:
    directory: "/etc/unbound"
    username: unbound
    # make sure unbound can access entropy from inside the chroot.
    # e.g. on linux the use these commands (on BSD, devfs(8) is
used):
    #      mount --bind -n /dev/random /etc/unbound/dev/random
    # and  mount --bind -n /dev/log /etc/unbound/dev/log
    chroot: "/etc/unbound"
    # logfile: "/etc/unbound/unbound.log"  #uncomment to use
logfile.
    pidfile: "/etc/unbound/unbound.pid"
    # verbosity: 1      # uncomment and increase to get more
logging.
    # listen on all interfaces, answer queries from the local
subnet.
    interface: 0.0.0.0
    interface: ::0
    access-control: 10.0.0.0/8 allow
    access-control: 2001:DB8::/64 allow
```

Format du fichier

Il doit y avoir des espaces entre les mots clés.

Les attributs terminent par deux-points (:)

Un attribut est suivi par ses attributs ou par une valeur.

Les fichiers peuvent être inclus en utilisant la directive **include:**.

Elle peut apparaître n'importe où, et accepte un nom de fichier unique comme argument.

Le traitement se poursuit comme si le texte à partir du fichier inclus avait été copié dans le fichier de configuration à cet endroit.

Si vous utilisez également chroot, avec des noms de chemin complets pour les fichiers inclus, les chemins relatifs pour les noms inclus fonctionnent si le répertoire où le démon est lancé est le réperoire chroot/de travail.

Les jokers peuvent être utilisés pour inclure des fichiers multiples.

Options de la clause server:

Options courantes

? verbosity: <number> :: The verbosity number
level 0 means no verbosity, only errors
Level 1 gives operational information
Level 2 gives detailed operational information
Level 3 gives query level information, output per query
Level 4 gives algorithm level information
Level 5 logs client identification for cache misses.
Default is level 1. !!
? interface: <ip address[@port]> :: Interface to use to connect to the network. This interface is listened to for queries from clients, and answers to clients are given from it. Can be given multiple times to work on several interfaces. If none are given the default is to listen to localhost. The interfaces are not changed on a reload (kill -HUP) but only on restart. A port number can be specified with @port (without spaces between interface and port number), if not specified the default port (from port) is used. !!
? port: <port number> :: The port number, default 53, on which the server responds to queries. !!
? access-control: <IP netblock> <action> :: The netblock is given as an IP4 or IP6 address with /size appended for a classless network block. The action can be deny, refuse, allow, allow_snoop, deny_non_local or refuse_non_local. The most specific netblock match is used, if none match deny is used.
The action deny stops queries from hosts from that netblock.
The action refuse stops queries too, but sends a DNS rcode REFUSED error message back.
The action allow gives access to clients from that netblock. It gives only access for recursion clients (which is what almost all clients need). Nonrecursive queries are refused.

The allow action does allow nonrecursive queries to access the local-data that is configured. The reason is that this does not involve the unbound server recursive lookup algorithm, and static data is served in the reply. This supports normal operations where nonrecursive queries are made for the authoritative data. For nonrecursive queries any replies from the dynamic cache are refused.
The action allow_snoop gives nonrecursive access too. This give both recursive and non recursive access. The name allow_snoop refers to cache snooping, a technique to use nonrecursive queries to examine the cache contents (for malicious acts). However, nonrecursive queries can also be a valuable debugging tool (when you want to examine the cache contents). In that case use allow_snoop for your administration host.
By default only localhost is allowed, the rest is refused. The default is refused, because that is protocol-friendly. The DNS protocol is not designed to handle dropped packets due to policy, and dropping may result in (possibly excessive) retried queries.
The deny_non_local and refuse_non_local settings are for hosts that are only allowed to query for the authoritative local-data, they are not allowed full recursion but only the static data. With deny_non_local, messages that are disallowed are dropped, with refuse_non_local they receive error code REFUSED. !!
? chroot: <directory> :: If chroot is enabled, you should pass the configfile (from the commandline) as a full path from the original root. After the chroot has been performed the now defunct portion of the config file path is removed to be able to reread the config after a reload.
All other file paths (working dir, logfile, roothints, and key files) can be specified in several ways: as an absolute path relative to the new root, as a relative path to the working directory, or as an absolute path relative to the original root. In the last case the path is adjusted to remove the unused portion.
The pidfile can be either a relative path to the working directory, or an absolute path relative to the original root. It is written just prior to chroot and dropping permissions. This allows the pidfile to be /var/run/unbound.pid and the chroot to be /var/unbound, for example.
Additionally, unbound may need to access /dev/random (for entropy) from inside the chroot.
If given a chroot is done to the given directory. The default is ”/usr/local/etc/unbound“. If you give ”“ no chroot is performed. !!
? logfile: <filename> :: If ”“ is given, logging goes to stderr, or nowhere once daemonized. The logfile is appended to, in the following format: [seconds since 1970] unbound[pid:tid]: type: message. If this option is given, the use-syslog is option is set to “no”. The logfile is reopened (for append) when the config file is reread, on SIGHUP.
? use-syslog: <yes or no> :: Sets unbound to send log messages to the syslogd, using syslog(3). The log facility LOG_DAEMON is used, with identity “unbound”. The logfile setting is overridden when use-syslog is turned on. The default is to log to syslog. !!
? local-zone: <zone> <type> :: Configure a local zone. The type determines the answer to give if there is no match from local-data. The types are deny, refuse, static, transparent, redirect, nodefault, typetransparent, inform, inform_deny, and are explained below. After that the default settings are listed. Use local-data: to enter data into the local zone. Answers for local zones are authoritative DNS answers. By default the zones are class IN.
If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below. !!

? deny :: Do not send an answer, drop the query. If there is a match from local data, the query is answered. !!
? refuse :: Send an error message reply, with rcode REFUSED. If there is a match from local data, the query is answered. !!
? static :: If there is a match from local data, the query is answered. Otherwise, the query is answered with nodata or nxdomain. For a negative answer a SOA is included in the answer if present as local-data for the zone apex domain. !!
? transparent :: If there is a match from local data, the query is answered. Otherwise if the query has

a different name, the query is resolved normally. If the query is for a name given in localdata but no such type of data is given in localdata, then a noerror nodata answer is returned. If no local-zone is given local-data causes a transparent zone to be created by default. !!
? typetransparent :: If there is a match from local data, the query is answered. If the query is for a different name, or for the same name but for a different type, the query is resolved normally. So, similar to transparent but types that are not listed in local data are resolved normally, so if an A record is in the local data that does not cause a nodata reply for AAAA queries. !!
? redirect :: The query is answered from the local data for the zone name. There may be no local data beneath the zone name. This answers queries for the zone, and all subdomains of the zone with the local data for the zone. It can be used to redirect a domain to return a different address record to the end user, with local-zone: “example.com.” redirect and local-data: “example.com. A 127.0.0.1” queries for www.example.com and www.foo.example.com are redirected, so that users with web browsers cannot access sites with suffix example.com. !!
? inform ::The query is answered normally. The client IP address (@portnumber) is printed to the logfile. The log message is: timestamp, unbound-pid, info: zonename inform IP@port queryname type class. This option can be used for normal resolution, but machines looking up infected names are logged, eg. to run antivirus on them. !!
? inform_deny :: The query is dropped, like 'deny', and logged, like 'inform'. Ie. find infected machines without answering the queries. !!
? nodefault :: Used to turn off default contents for AS112 zones. The other types also turn off default contents for the zone. The 'nodefault' option has no other effect than turning off default contents for the given zone. Use nodefault if you use exactly that zone, if you want to use a subzone, use transparent. !!

? <zone> :: The default zones are localhost, reverse 127.0.0.1 and ::1, and the AS112 zones. The AS112 zones are reverse DNS zones for private use and reserved IP addresses for which the servers on the internet cannot provide correct answers. They are configured by default to give nxdomain (no reverse information) answers. The defaults can be turned off by specifying your own local-zone of that name, or using the 'nodefault' type. Below is a list of the default zone contents. !!

? localhost :: The IP4 and IP6 localhost information is given. NS and SOA records are provided for completeness and to satisfy some DNS update tools. Default content:

```
                local-zone: "localhost." static
                local-data: "localhost. 10800 IN NS localhost."
                local-data: "localhost. 10800 IN
                    SOA localhost. nobody.invalid. 1 3600 1200 604800
10800"
                local-data: "localhost. 10800 IN A 127.0.0.1"
                local-data: "localhost. 10800 IN AAAA ::1"
```

!!

? reverse IPv4 loopback :: Default content:

```
                local-zone: "127.in-addr.arpa." static
                local-data: "127.in-addr.arpa. 10800 IN NS localhost."
                local-data: "127.in-addr.arpa. 10800 IN
                    SOA localhost. nobody.invalid. 1 3600 1200 604800
10800"
                local-data: "1.0.0.127.in-addr.arpa. 10800 IN
```

```
                        PTR localhost."
```

!!

? reverse IPv6 loopback :: Default content:

```
                    local-zone: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                        0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa." static
                    local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                        0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                        NS localhost."
                    local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                        0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                        SOA localhost. nobody.invalid. 1 3600 1200 604800
10800"
                    local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                        0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                        PTR localhost."
```

:!

? reverse RFC1918 local use zones :: Reverse data for zones 10.in-addr.arpa, 16.172.in-addr.arpa to 31.172.in-addr.arpa, 168.192.in-addr.arpa. The local-zone: is set static and as local-data: SOA and NS records are provided. !!
? reverse RFC3330 IP4 this, link-local, testnet and broadcast :: Reverse data for zones 0.in-addr.arpa, 254.169.in-addr.arpa, 2.0.192.in-addr.arpa (TEST NET 1), 100.51.198.in-addr.arpa (TEST NET 2), 113.0.203.in-addr.arpa (TEST NET 3), 255.255.255.255.in-addr.arpa. And from 64.100.in-addr.arpa to 127.100.in-addr.arpa (Shared Address Space). !!
? reverse RFC4291 IP6 unspecified :: Reverse data for zone
0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. !!
? reverse RFC4193 IPv6 Locally Assigned Local Addresses :: Reverse data for zone D.F.ip6.arpa. !!
? reverse RFC4291 IPv6 Link Local Addresses :: Reverse data for zones 8.E.F.ip6.arpa to B.E.F.ip6.arpa. !!
? reverse IPv6 Example Prefix :: Reverse data for zone 8.B.D.0.1.0.0.2.ip6.arpa. This zone is used for tutorials and examples. You can remove the block on this zone with:

```
local-zone: 8.B.D.0.1.0.0.2.ip6.arpa. nodefault
```

You can also selectively unblock a part of the zone by making that part transparent with a local-zone statement. This also works with the other default zones. !!

? local-data: ”<resource record string>“ :: Configure local data, which is served in reply to queries for it. The query has to match exactly unless you configure the local-zone as redirect. If not matched exactly, the local-zone type determines further processing. If local-data is configured that is not a subdomain of a local-zone, a transparent local-zone is configured. For record types such as TXT, use single quotes, as in

```
local-data: 'example. TXT "text"'.
```

If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or

DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below. !!

Server Options

These options are part of the **server:** clause.

? verbosity: <number> :: Niveau de verbosité Valeur par défaut : **1** !!

? 0 :: pas de verbosité , seulement les erreurs. !!
? 1 :: operational information. !!
? 2 :: detailed operational information. !!
? 3 :: gives query level information, output per query. !!
? 4 :: gives algorithm level information. !!
? 5 :: logs client identification for cache misses. !!

? interface: <ip address[@port]> :: Interface à utiliser pour se connecter au réseau. :: Cette interface est écoutée pour les requêtes des clients, et les réponses aux clients viennent d'elle. :: Peut être donné plusieurs fois pour travailler sur plusieurs interfaces. :: Si aucune n'est fournie, la valeur par défaut est d'écouter sur localhost. :: Les interfaces ne sont pas modifiés par un reload (**kill -HUP**) mais seulement au redémarrage. :: Un numéro de port peut être spécifié avec **@port** (sans espace entre l'interface et le numéro de port), :: si non spécifié le port par défaut (défini par **port**) est utilisé. !!

? access-control: <IP netblock> <action> :: The netblock is given as an IP4 or IP6 address with /size appended for a classless network block. :: The action can be deny, refuse, allow or allow_snoop. :: By default only localhost is allowed, the rest is refused. :: The default is refused, because that is protocol-friendly. :: The DNS protocol is not designed to handle dropped packets due to policy, and dropping may result in (possibly excessive) retried queries.!!

? deny :: stops queries from hosts from that netblock. !!
? refuse :: stops queries too, but sends a DNS rcode REFUSED error message back. !!
? allow :: gives access to clients from that netblock. It gives only access for recursion clients (which is what almost all clients need). Nonrecursive queries are refused. :: allow action does allow nonrecursive queries to access the local-data that is configured. :: The reason is that this does not involve the unbound server recursive lookup algorithm, and static data is served in the reply. :: This supports normal operations where nonrecursive queries are made for the authoritative data. :: For nonrecursive queries any replies from the dynamic cache are refused. !!

? allow_snoop :: gives nonrecursive access too. This give both recursive and non recursive access. :: The name allow_snoop refers to cache snooping, a technique to use nonrecursive queries to examine the cache contents (for malicious acts). :: However, nonrecursive queries can also be a valuable debugging tool (when you want to examine the cache contents). :: In that case use allow_snoop for your administration host. !!

? chroot: <directory> :: If chroot is enabled, you should pass the configfile (from the commandline) as a full path from the original root. :: After the chroot has been performed the now defunct portion of the config file path is removed to be able to reread the config after a reload. :: All other file paths (working dir, logfile, roothints, and key files) can be specified in several ways: as an absolute path

relative to the new root, as a relative path to the working directory, or as an absolute path relative to the original root. :: In the last case the path is adjusted to remove the unused portion. :: The pidfile can be either a relative path to the working directory, or an absolute path relative to the original root. :: It is written just prior to chroot and dropping permissions. :: This allows the pidfile to be /var/run/unbound.pid and the chroot to be /var/unbound, for example. :: Additionally, unbound may need to access /dev/random (for entropy) from inside the chroot. :: If given a chroot is done to the given directory. :: The default is ”/etc/unbound“. :: If you give ”“ no chroot is performed. !!

? logfile: <filename> :: If ”“ is given, logging goes to stderr, or nowhere once daemonized. :: The logfile is appended to, in the following format:**[seconds since 1970] unbound[pid:tid]: type: message.** :: If this option is given, the use-syslog is option is set to “no”. The logfile is reopened (for append) when the config file is reread, on SIGHUP. !!

? use-syslog: <yes or no> :: Sets unbound to send log messages to the syslogd, using syslog(3). :: The log facility LOG_DAEMON is used, with identity “unbound”. :: The logfile setting is overridden when use-syslog is turned on. :: The default is to log to syslog.!!

? local-zone: <zone> <type> ::Configure a local zone. :: The type determines the answer to give if there is no match from local-data. :: The types are deny, refuse, static, transparent, redirect, nodefault, and are explained below. :: After that the default settings are listed. :: Use local-data: to enter data into the local zone. :: Answers for local zones are authoritative DNS answers. :: By default the zones are class IN. ::If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below.

? deny :: Do not send an answer, drop the query. :: If there is a match from local data, the query is answered. !!

? refuse :: Send an error message reply, with rcode REFUSED. :: If there is a match from local data, the query is answered. !!

? static :: If there is a match from local data, the query is answered. :: Otherwise, the query is answered with nodata or nxdomain. :: For a negative answer a SOA is included in the answer if present as local-data for the zone apex domain. !!

? transparent :: If there is a match from local data, the query is answered. :: Otherwise if the query has a different name, the query is resolved normally. :: If the query is for a name given in localdata but no such type of data is given in localdata, then a noerror nodata answer is returned. :: If no local-zone is given local-data causes a transparent zone to be created by default. !!

? redirect :: The query is answered from the local data for the zone name. :: There may be no local data beneath the zone name. :: This answers queries for the zone, and all subdomains of the zone with the local data for the zone. :: It can be used to redirect a domain to return a different address record to the end user, with **local-zone: "example.com." redirect** and **local-data: "example.com. A 127.0.0.1"** queries for www.example.com and www.foo.example.com are redirected, so that users with web browsers cannot access sites with suffix example.com. !!

? nodefault :: Used to turn off default contents for AS112 zones. :: The other types also turn off default contents for the zone. :: The 'nodefault' option has no other effect than turning off default contents for

the given zone. :: The default zones are localhost, reverse 127.0.0.1 and ::1, and the AS112 zones. :: The AS112 zones are reverse DNS zones for private use and reserved IP addresses for which the servers on the internet cannot provide correct answers. :: They are configured by default to give nxdomain (no reverse information) answers. :: The defaults can be turned off by specifying your own local-zone of that name, or using the 'nodefault' type. :: Below is a list of the default zone contents. !!

? localhost ::The IP4 and IP6 localhost information is given. NS and SOA records are provided for completeness and to satisfy some DNS update tools. Default content:

```
     local-zone: "localhost." static
     local-data: "localhost. 10800 IN NS localhost."
     local-data: "localhost. 10800 IN
         SOA localhost. nobody.invalid. 1 3600 1200 604800 10800"
     local-data: "localhost. 10800 IN A 127.0.0.1"
     local-data: "localhost. 10800 IN AAAA ::1"
```

!!

?reverse IPv4 loopback::Default content:

```
     local-zone: "127.in-addr.arpa." static
     local-data: "127.in-addr.arpa. 10800 IN NS localhost."
     local-data: "127.in-addr.arpa. 10800 IN
         SOA localhost. nobody.invalid. 1 3600 1200 604800 10800"
     local-data: "1.0.0.127.in-addr.arpa. 10800 IN
         PTR localhost."
```

!!

?reverse IPv6 loopback::Default content:

```
     local-zone: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
         0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa." static
     local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
         0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
         NS localhost."
     local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
         0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
         SOA localhost. nobody.invalid. 1 3600 1200 604800 10800"
     local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
         0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
         PTR localhost."
```

!!

? reverse RFC1918 local use zones :: Reverse data for zones 10.in-addr.arpa, 16.172.in-addr.arpa to 31.172.in-addr.arpa, 168.192.in-addr.arpa. :: The local-zone: is set static and as local-data: SOA and NS records are provided. !!

? reverse RFC3330 IP4 this, link-local, testnet and broadcast :: Reverse data for zones 0.in-addr.arpa,

254.169.in-addr.arpa, 2.0.192.in-addr.arpa (TEST NET 1), 100.51.198.in-addr.arpa (TEST NET 2), 113.0.203.in-addr.arpa (TEST NET 3), 255.255.255.255.in-addr.arpa. !!

? reverse RFC4291 IP6 unspecified :: Reverse data for zone

```
      0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
      0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa.
```

!!

? reverse RFC4193 IPv6 Locally Assigned Local Addresses :: Reverse data for zone D.F.ip6.arpa. !!

? reverse RFC4291 IPv6 Link Local Addresses :: Reverse data for zones 8.E.F.ip6.arpa to B.E.F.ip6.arpa. !!

? reverse RFC4843 Orchid Prefix :: Reverse data for zone 0.1.1.0.0.2.ip6.arpa. !!

? reverse IPv6 Example Prefix :: Reverse data for zone 8.B.D.0.1.0.0.2.ip6.arpa. :: This zone is used for tutorials and examples. :: You can remove the block on this zone with:

```
       local-zone: 8.B.D.0.1.0.0.2.ip6.arpa. nodefault
```

You can also selectively unblock a part of the zone by making that part transparent with a local-zone statement. :: This also works with the other default zones.!!

? local-data: <resource record string> :: Configure local data, which is served in reply to queries for it. :: The query has to match exactly unless you configure the local-zone as redirect. :: If not matched exactly, the local-zone type determines further processing. :: If local-data is configured that is not a subdomain of a local-zone, a transparent local-zone is configured. :: For record types such as TXT, use single quotes, as in local-data: 'example. TXT "text"'. !!

If you need more complicated authoritative data, with referrals, wildcards, CNAME/DNAME support, or DNSSEC authoritative service, setup a stub-zone for it as detailed in the stub zone section below.

? local-data-ptr: IPaddr name ::Configure local data shorthand for a PTR record with the reversed IPv4 or IPv6 address and the host name. :: For example **192.0.2.4 www.example.com**. TTL can be inserted like this: **2001:DB8::4 7200 www.example.com** !!

?statistics-interval: <seconds>::The number of seconds between printing statistics to the log for every thread. Disable with value 0 or ””. Default is disabled.!!
?statistics-cumulative: <yes or no>::If enabled, statistics are cumulative since starting unbound, without clearing the statistics counters after logging the statistics. Default is no.!!
?extended-statistics: <yes or no>::If enabled, extended statistics are printed from unbound-control(8). Default is off, because keeping track of more statistics takes time. The counters are listed in unbound-control(8).!!
?num-threads: <number>::The number of threads to create to serve clients. Use 1 for no threading.!!
?port: <port number>::The port number, default 53, on which the server responds to queries.!!
?interface-automatic: <yes or no>::Detect source interface on UDP queries and copy them to replies. This feature is experimental, and needs support in your OS for IPv6 (and its socket options) and IPv4

(and have source-interface socket options). Default value is no.!!
?outgoing-interface: <ip address>::Interface to use to connect to the network. This interface is used to send queries to authoritative servers and receive their replies. Can be given multiple times to work on several interfaces. If none are given the default (all) is used. You can specify the same interfaces in interface: and outgoing-interface: lines, the interfaces are then used for both purposes. Outgoing queries are sent via a random outgoing interface to counter spoofing.!!
?outgoing-range: <number>::Number of ports to open. This number of file descriptors can be opened per thread. Must be at least 1. Default is 256. Larger numbers need extra resources from the operating system.!!
?outgoing-port-permit: <port number or range>::Permit unbound to open this port or range of ports for use to send queries. A larger number of permitted outgoing ports increases resilience against spoofing attempts. Make sure these ports are not needed by other daemons. By default only ports above 1024 that have not been assigned by IANA are used. Give a port number or a range of the form “low-high”, without spaces.::The outgoing-port-permit and outgoing-port-avoid statements are processed in the line order of the config file, adding the permitted ports and subtracting the avoided ports from the set of allowed ports. The processing starts with the non IANA allocated ports above 1024 in the set of allowed ports.!!
?outgoing-port-avoid: <port number or range>::Do not permit unbound to open this port or range of ports for use to send queries. Use this to make sure unbound does not grab a port that another daemon needs. The port is avoided on all outgoing interfaces, both IP4 and IP6. By default only ports above 1024 that have not been assigned by IANA are used. Give a port number or a range of the form “low-high”, without spaces.!!
?outgoing-num-tcp: <number>::Number of outgoing TCP buffers to allocate per thread. Default is 10. If set to 0, or if do_tcp is “no”, no TCP queries to authoritative servers are done.!!
?incoming-num-tcp: <number>::Number of incoming TCP buffers to allocate per thread. Default is 10. If set to 0, or if do_tcp is “no”, no TCP queries from clients are accepted.!!
?edns-buffer-size: <number>::Number of bytes size to advertise as the EDNS reassembly buffer size. This is the value put into datagrams over UDP towards peers. The actual buffer size is determined by msg-buffer-size (both for TCP and UDP). Do not set lower than that value. Default is 4096 which is RFC recommended. If you have fragmentation reassembly problems, usually seen as timeouts, then a value of 1480 can fix it. Setting to 512 bypasses even the most stringent path MTU problems, but is seen as extreme, since the amount of TCP fallback generated is excessive (probably also for this resolver, consider tuning the outgoing tcp number).!!
?msg-buffer-size: <number>::Number of bytes size of the message buffers. Default is 65552 bytes, enough for 64 Kb packets, the maximum DNS message size. No message larger than this can be sent or received. Can be reduced to use less memory, but some requests for DNS data, such as for huge resource records, will result in a SERVFAIL reply to the client.!!
?msg-cache-size: <number>::Number of bytes size of the message cache. Default is 4 megabytes. A plain number is in bytes, append 'k', 'm' or 'g' for kilobytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).!!
?msg-cache-slabs: <number>::Number of slabs in the message cache. Slabs reduce lock contention by threads. Must be set to a power of 2. Setting (close) to the number of cpus is a reasonable guess.!!
?num-queries-per-thread: <number>::The number of queries that every thread will service simultaneously. If more queries arrive that need servicing, and no queries can be jostled out (see jostle-timeout), then the queries are dropped. This forces the client to resend after a timeout; allowing the server time to work on the existing queries. Default 1024.!!
?jostle-timeout: <msec>::Timeout used when the server is very busy. Set to a value that usually results in one roundtrip to the authority servers. If too many queries arrive, then 50% of the queries are allowed to run to completion, and the other 50% are replaced with the new incoming query if they have already spent more than their allowed time. This protects against denial of service by slow

queries or high query rates. Default 200 milliseconds.!!
?so-rcvbuf: <number>::If not 0, then set the SO_RCVBUF socket option to get more buffer space on UDP port 53 incoming queries. So that short spikes on busy servers do not drop packets (see counter in netstat -su). Default is 0 (use system value). Otherwise, the number of bytes to ask for, try “4m” on a busy server. The OS caps it at a maximum, on linux unbound needs root permission to bypass the limit, or the admin can use sysctl net.core.rmem_max. On BSD change kern.ipc.maxsockbuf in /etc/sysctl.conf. On OpenBSD change header and recompile kernel. On Solaris ndd -set /dev/udp udp_max_buf 8388608.!!
?rrset-cache-size: <number>::Number of bytes size of the RRset cache. Default is 4 megabytes. A plain number is in bytes, append 'k', 'm' or 'g' for kilobytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).!!
?rrset-cache-slabs: <number>::Number of slabs in the RRset cache. Slabs reduce lock contention by threads. Must be set to a power of 2.!!
?cache-max-ttl: <seconds>::Time to live maximum for RRsets and messages in the cache. Default is 86400 seconds (1 day). If the maximum kicks in, responses to clients still get decrementing TTLs based on the original (larger) values. When the internal TTL expires, the cache item has expired. Can be set lower to force the resolver to query for data often, and not trust (very large) TTL values.!!
?cache-min-ttl: <seconds>::Time to live minimum for RRsets and messages in the cache. Default is 0. If the the minimum kicks in, the data is cached for longer than the domain owner intended, and thus less queries are made to look up the data. Zero makes sure the data in the cache is as the domain owner intended, higher values, especially more than an hour or so, can lead to trouble as the data in the cache does not match up with the actual data any more.!!
?infra-host-ttl: <seconds>::Time to live for entries in the host cache. The host cache contains roundtrip timing and EDNS support information. Default is 900.!!
?infra-lame-ttl: <seconds>::The time to live when a delegation is discovered to be lame. Default is 900.!!
?infra-cache-slabs: <number>::Number of slabs in the infrastructure cache. Slabs reduce lock contention by threads. Must be set to a power of 2.!!
?infra-cache-numhosts: <number>::Number of hosts for which information is cached. Default is 10000.!!
?infra-cache-lame-size: <number>::Number of bytes that the lameness cache per host is allowed to use. Default is 10 kb, which gives maximum storage for a couple score zones, depending on the lame zone name lengths.!!
?do-ip4: <yes or no>::Enable or disable whether ip4 queries are answered or issued. Default is yes.!!
?do-ip6: <yes or no>::Enable or disable whether ip6 queries are answered or issued. Default is yes. If disabled, queries are not answered on IPv6, and queries are not sent on IPv6 to the internet nameservers.!!
?do-udp: <yes or no>::Enable or disable whether UDP queries are answered or issued. Default is yes.!!
?do-tcp: <yes or no>::Enable or disable whether TCP queries are answered or issued. Default is yes.!!
?do-daemonize: <yes or no>::Enable or disable whether the unbound server forks into the background as a daemon. Default is yes.!!
?username: <name>::If given, after binding the port the user privileges are dropped. Default is “unbound”. If you give username: ”“ no user change is performed. ::If this user is not capable of binding the port, reloads (by signal HUP) will still retain the opened ports. If you change the port number in the config file, and that new port number requires privileges, then a reload will fail; a restart is needed.!!

?directory: <directory>::Sets the working directory for the program. Default is ”/etc/unbound“.!!
?log-time-ascii: <yes or no>::Sets logfile lines to use a timestamp in UTC ascii. Default is no, which prints the seconds since 1970 in brackets. No effect if using syslog, in that case syslog formats the

timestamp printed into the log files.!!
?pidfile: <filename>::The process id is written to the file. Default is ”/var/run/unbound/unbound.pid“. So,

```
kill -HUP `cat /var/run/unbound/unbound.pid`
```

triggers a reload,

```
kill -QUIT `cat /var/run/unbound/unbound.pid`
```

gracefully terminates.!!

?root-hints: <filename>::Read the root hints from this file. Default is nothing, using builtin hints for the IN class. The file has the format of zone files, with root nameserver names and addresses only. The default may become outdated, when servers change, therefore it is good practice to use a root-hints file.!!
?hide-identity: <yes or no>::If enabled id.server and hostname.bind queries are refused.!!
?identity: <string>::Set the identity to report. If set to ”“, the default, then the hostname of the server is returned.!!
?hide-version: <yes or no>::If enabled version.server and version.bind queries are refused.!!
?version: <string>::Set the version to report. If set to ”“, the default, then the package version is returned.!!
?target-fetch-policy: <list of numbers>::Set the target fetch policy used by unbound to determine if it should fetch nameserver target addresses opportunistically. The policy is described per dependency depth. ::The number of values determines the maximum dependency depth that unbound will pursue in answering a query. A value of -1 means to fetch all targets opportunistically for that dependency depth. A value of 0 means to fetch on demand only. A positive value fetches that many targets opportunistically. ::Enclose the list between quotes (”“) and put spaces between numbers. The default is “3 2 1 0 0”. Setting all zeroes, “0 0 0 0 0” gives behaviour closer to that of BIND 9, while setting ”-1 -1 -1 -1 -1“ gives behaviour rumoured to be closer to that of BIND 8.!!

?harden-short-bufsize: <yes or no>::Very small EDNS buffer sizes from queries are ignored. Default is off, since it is legal protocol wise to send these, and unbound tries to give very small answers to these queries, where possible.!!
?harden-large-queries: <yes or no>::Very large queries are ignored. Default is off, since it is legal protocol wise to send these, and could be necessary for operation if TSIG or EDNS payload is very large.!!
?harden-glue: <yes or no>::Will trust glue only if it is within the servers authority. Default is on.!!
?harden-dnssec-stripped: <yes or no>::Require DNSSEC data for trust-anchored zones, if such data is absent, the zone becomes bogus. If turned off, and no DNSSEC data is received (or the DNSKEY data fails to validate), then the zone is made insecure, this behaves like there is no trust anchor. You could turn this off if you are sometimes behind an intrusive firewall (of some sort) that removes DNSSEC data from packets, or a zone changes from signed to unsigned to badly signed often. If turned off you run the risk of a downgrade attack that disables security for a zone. Default is on.!!
?harden-referral-path: <yes or no>::Harden the referral path by performing additional queries for infrastructure data. Validates the replies if trust anchors are configured and the zones are signed. This enforces DNSSEC validation on nameserver NS sets and the nameserver addresses that are encountered on the referral path to the answer. Default off, because it burdens the authority servers, and it is not RFC standard, and could lead to performance problems because of the extra query load that is generated. Experimental option. If you enable it consider adding more numbers after the

target-fetch-policy to increase the max depth that is checked to.!!
?use-caps-for-id: <yes or no>::Use 0x20-encoded random bits in the query to foil spoof attempts. This perturbs the lowercase and uppercase of query names sent to authority servers and checks if the reply still has the correct casing. Disabled by default. This feature is an experimental implementation of draft dns-0x20.!!
?private-address: <IP address or subnet>::Give IPv4 of IPv6 addresses or classless subnets. These are addresses on your private network, and are not allowed to be returned for public internet names. Any occurence of such addresses are removed from DNS answers. Additionally, the DNSSEC validator may mark the answers bogus. This protects against so-called DNS Rebinding, where a user browser is turned into a network proxy, allowing remote access through the browser to other parts of your private network. Some names can be allowed to contain your private addresses, by default all the local-data that you configured is allowed to, and you can specify additional names using private-domain. No private addresses are enabled by default. We consider to enable this for the RFC1918 private IP address space by default in later releases. That would enable private addresses for 10.0.0.0/8 172.16.0.0/12 192.168.0.0/16 192.254.0.0/16 fd00::/8 and fe80::/10, since the RFC standards say these addresses should not be visible on the public internet. Turning on 127.0.0.0/8 would hinder many spamblocklists as they use that.!!
?private-domain: <domain name>::Allow this domain, and all its subdomains to contain private addresses. Give multiple times to allow multiple domain names to contain private addresses. Default is none.!!
?unwanted-reply-threshold: <number>::If set, a total number of unwanted replies is kept track of in every thread. When it reaches the threshold, a defensive action is taken and a warning is printed to the log. The defensive action is to clear the rrset and message caches, hopefully flushing away any poison. A value of 10 million is suggested. Default is 0 (turned off).!!
?do-not-query-address: <IP address>::Do not query the given IP address. Can be IP4 or IP6. Append /num to indicate a classless delegation netblock, for example like 10.2.3.4/24 or 2001::11/64.!!
?do-not-query-localhost: <yes or no>::If yes, localhost is added to the do-not-query-address entries, both IP6 ::1 and IP4 127.0.0.1/8. If no, then localhost can be used to send queries to. Default is yes.!!
?prefetch: <yes or no>::If yes, message cache elements are prefetched before they expire to keep the cache up to date. Default is no. Turning it on gives about 10 percent more traffic and load on the machine, but popular items do not expire from the cache.!!
?prefetch-key: <yes or no>::If yes, fetch the DNSKEYs earlier in the validation process, when a DS record is encountered. This lowers the latency of requests. It does use a little more CPU. Also if the cache is set to 0, it is no use. Default is no.!!
?module-config: <module names>::Module configuration, a list of module names separated by spaces, surround the string with quotes (””). The modules can be validator, iterator. Setting this to “iterator” will result in a non-validating server. Setting this to “validator iterator” will turn on DNSSEC validation. The ordering of the modules is important. You must also set trust-anchors for validation to be useful.!!
?trust-anchor-file: <filename>::File with trusted keys for validation. Both DS and DNSKEY entries can appear in the file. The format of the file is the standard DNS Zone file format. Default is ””, or no trust anchor file.!!
?auto-trust-anchor-file: <filename>::File with trust anchor for one zone, which is tracked with RFC5011 probes. The probes are several times per month, thus the machine must be online frequently. The initial file can be one with contents as described in trust-anchor-file. The file is written to when the anchor is updated, so the unbound user must have write permission.!!
?trust-anchor: <Resource Record>::A DS or DNSKEY RR for a key to use for validation. Multiple entries can be given to specify multiple trusted keys, in addition to the trust-anchor-files. The resource record is entered in the same format as 'dig' or 'drill' prints them, the same format as in the zone file. Has to be on a single line, with ”“ around it. A TTL can be specified for ease of cut and paste, but is ignored. A class can be specified, but class IN is default.!!

?trusted-keys-file: <filename>::File with trusted keys for validation. Specify more than one file with several entries, one file per entry. Like trust-anchor-file but has a different file format. Format is BIND-9 style format, the trusted-keys { name flag proto algo “key”; }; clauses are read. It is possible to use wildcards with this statement, the wildcard is expanded on start and on reload.!!
?dlv-anchor-file: <filename>::File with trusted keys for DLV (DNSSEC Lookaside Validation). Both DS and DNSKEY entries can be used in the file, in the same format as for trust-anchor-file: statements. Only one DLV can be configured, more would be slow. The DLV configured is used as a root trusted DLV, this means that it is a lookaside for the root. Default is ”“, or no dlv anchor file.!!
?dlv-anchor: <Resource Record>::Much like trust-anchor, this is a DLV anchor with the DS or DNSKEY inline.!!
?domain-insecure: <domain name>::Sets domain name to be insecure, DNSSEC chain of trust is ignored towards the domain name. So a trust anchor above the domain name can not make the domain secure with a DS record, such a DS record is then ignored. Also keys from DLV are ignored for the domain. Can be given multiple times to specify multiple domains that are treated as if unsigned. If you set trust anchors for the domain they override this setting (and the domain is secured). ::This can be useful if you want to make sure a trust anchor for external lookups does not affect an (unsigned) internal domain. A DS record externally can create validation failures for that internal domain.!!

?val-override-date: <rrsig-style date spec>::Default is ”“ or “0”, which disables this debugging feature. If enabled by giving a RRSIG style date, that date is used for verifying RRSIG inception and expiration dates, instead of the current date. Do not set this unless you are debugging signature inception and expiration.!!
?val-sig-skew-min: <seconds>::Minimum number of seconds of clock skew to apply to validated signatures. A value of 10% of the signature lifetime (expiration - inception) is used, capped by this setting. Default is 3600 (1 hour) which allows for daylight savings differences. Lower this value for more strict checking of short lived signatures.!!
?val-sig-skew-max: <seconds>::Maximum number of seconds of clock skew to apply to validated signatures. A value of 10% of the signature lifetime (expiration - inception) is used, capped by this setting. Default is 86400 (24 hours) which allows for timezone setting problems in stable domains. Setting both min and max very low disables the clock skew allowances. Setting both min and max very high makes the validator check the signature timestamps less strictly.!!
?val-bogus-ttl: <number>::The time to live for bogus data. This is data that has failed validation; due to invalid signatures or other checks. The TTL from that data cannot be trusted, and this value is used instead. The value is in seconds, default 60. The time interval prevents repeated revalidation of bogus data.!!
?val-clean-additional: <yes or no>::Instruct the validator to remove data from the additional section of secure messages that are not signed properly. Messages that are insecure, bogus, indeterminate or unchecked are not affected. Default is yes. Use this setting to protect the users that rely on this validator for authentication from protentially bad data in the additional section.!!
?val-log-level: <number>::Have the validator print validation failures to the log. Regardless of the verbosity setting. Default is 0, off. At 1, for every user query that fails a line is printed to the logs. This way you can monitor what happens with validation. Use a diagnosis tool, such as dig or drill, to find out why validation is failing for these queries. At 2, not only the query that failed is printed but also the reason why unbound thought it was wrong and which server sent the faulty data.!!
?val-permissive-mode: <yes or no>::Instruct the validator to mark bogus messages as indeterminate. The security checks are performed, but if the result is bogus (failed security), the reply is not withheld from the client with SERVFAIL as usual. The client receives the bogus data. For messages that are found to be secure the AD bit is set in replies. Also logging is performed as for full validation. The default value is “no”.!!
?val-nsec3-keysize-iterations: <list of values>::List of keysize and iteration count values, separated

by spaces, surrounded by quotes. Default is “1024 150 2048 500 4096 2500”. This determines the maximum allowed NSEC3 iteration count before a message is simply marked insecure instead of performing the many hashing iterations. The list must be in ascending order and have at least one entry. If you set it to “1024 65535” there is no restriction to NSEC3 iteration values. This table must be kept short; a very long list could cause slower operation.!!
?add-holddown: <seconds>::Instruct the auto-trust-anchor-file probe mechanism for RFC5011 autotrust updates to add new trust anchors only after they have been visible for this time. Default is 30 days as per the RFC.!!
?del-holddown: <seconds>::Instruct the auto-trust-anchor-file probe mechanism for RFC5011 autotrust updates to remove revoked trust anchors after they have been kept in the revoked list for this long. Default is 30 days as per the RFC.!!
?keep-missing: <seconds>::Instruct the auto-trust-anchor-file probe mechanism for RFC5011 autotrust updates to remove missing trust anchors after they have been unseen for this long. This cleans up the state file if the target zone does not perform trust anchor revocation, so this makes the auto probe mechanism work with zones that perform regular (non-5011) rollovers. The default is 366 days. The value 0 does not remove missing anchors, as per the RFC.!!
?key-cache-size: <number>::Number of bytes size of the key cache. Default is 4 megabytes. A plain number is in bytes, append 'k', 'm' or 'g' for kilobytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).!!
?key-cache-slabs: <number>::Number of slabs in the key cache. Slabs reduce lock contention by threads. Must be set to a power of 2. Setting (close) to the number of cpus is a reasonable guess.!!
?neg-cache-size: <number>::Number of bytes size of the aggressive negative cache. Default is 1 megabyte. A plain number is in bytes, append 'k', 'm' or 'g' for kilobytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).!!

Remote Control Options

In the remote-control: clause are the declarations for the remote control facility. If this is enabled, the unbound-control(8) utility can be used to send commands to the running unbound server. The server uses these clauses to setup SSLv3 / TLSv1 security for the connection. The unbound-control(8) utility also reads the remote-control section for options. To setup the correct self-signed certificates use the unbound-control-setup(8) utility.

?control-enable: <yes or no>::The option is used to enable remote control, default is “no”. If turned off, the server does not listen for control commands.!!
?control-interface: <ip address>::Give IPv4 or IPv6 addresses to listen on for control commands. By default localhost (127.0.0.1 and ::1) is listened to. Use 0.0.0.0 and ::0 to listen to all interfaces.!!
?control-port: <port number>::The port number to listen on for control commands, default is 953 (that is the same port number named uses to listen to rndc). If you change this port number, and permissions have been dropped, a reload is not sufficient to open the port again, you must then restart.!!
?server-key-file: <private key file>::Path to the server private key, by default unbound_server.key. This file is generated by the unbound-control-setup utility. This file is used by the unbound server, but not by unbound-control.!!
?server-cert-file: <certificate file.pem>::Path to the server self signed certificate, by default unbound_server.pem. This file is generated by the unbound-control-setup utility. This file is used by the unbound server, and also by unbound-control.!!
?control-key-file: <private key file>::Path to the control client private key, by default unbound_control.key. This file is generated by the unbound-control-setup utility. This file is used by unbound-control.!!

?control-cert-file: <certificate file.pem>::Path to the control client certificate, by default unbound_control.pem. This certificate has to be signed with the server certificate. This file is generated by the unbound-control-setup utility. This file is used by unbound-control.!!

Stub Zone Options

There may be multiple stub-zone: clauses. Each with a name: and zero or more hostnames or IP addresses. For the stub zone this list of nameservers is used. Class IN is assumed. The servers should be authority servers, not recursors; unbound performs the recursive processing itself for stub zones. The stub zone can be used to configure authoritative data to be used by the resolver that cannot be accessed using the public internet servers. This is useful for company-local data or private zones. Setup an authoritative server on a different host (or different port). Enter a config entry for unbound with stub-addr: <ip address of host[@port]>. The unbound resolver can then access the data, without referring to the public internet for it. This setup allows DNSSEC signed zones to be served by that authoritative server, in which case a trusted key entry with the public key can be put in config, so that unbound can validate the data and set the AD bit on replies for the private zone (authoritative servers do not set the AD bit). This setup makes unbound capable of answering queries for the private zone, and can even set the AD bit ('authentic'), but the AA ('authoritative') bit is not set on these replies.

?name: <domain name>::Name of the stub zone.!!
?stub-host: <domain name>::Name of stub zone nameserver. Is itself resolved before it is used.!!
?stub-addr: <IP address>::IP address of stub zone nameserver. Can be IP 4 or IP 6. To use a nondefault port for DNS communication append '@' with the port number.!!
?stub-prime: <yes or no>::This option is by default off. If enabled it performs NS set priming, which is similar to root hints, where it starts using the list of nameservers currently published by the zone. Thus, if the hint list is slightly outdated, the resolver picks up a correct list online.!!

Forward Zone Options

There may be multiple **forward-zone:** clauses. Each with a name: and zero or more hostnames or IP addresses.

For the forward zone this list of nameservers is used to forward the queries to.

The servers listed as **forward-host:** and **forward-addr:** have to handle further recursion for the query.

Thus, those servers are not authority servers, but are (just like unbound is) recursive servers too; unbound does not perform recursion itself for the forward zone, it lets the remote server do it.

Class IN is assumed.

A forward-zone entry with name ”.“ and a forward-addr target will forward all queries to that other server (unless it can answer from the cache).

? name: <domain name> :: Name of the forward zone. !!

? forward-host: <domain name> :: Name of server to forward to. :: Is itself resolved before it is used. !!

? forward-addr: <IP address> :: IP address of server to forward to. Can be IP 4 or IP 6. :: To use a nondefault port for DNS communication append '@' with the port number. !!

Python Module Options

The python: clause gives the settings for the python(1) script module. This module acts like the iterator and validator modules do, on queries and answers. To enable the script module it has to be compiled into the daemon, and the word “python” has to be put in the module-config: option (usually first, or between the validator and iterator).

?python-script: <python file>::The script file to load.!!

Options du serveur

Ces options font partiede la clause **server:**

verbosity: <nombre>

Niveau de verbosité

?0::pas de verbosité, seulement les erreurs!!
?1::informations opérationnelles!!
?2::informations opérationnelles détaillées!!
?3::information au niveau de la requête, triée par requête.!!
?4::information au niveau de l'algorithme.!!
?5::identification des clients pour les défauts de cache.!! Valeur par défaut : **1**

```
FILE FORMAT

       statistics-interval: <seconds>
              The number of seconds between printing statistics to the log
for
              every  thread.  Disable with value 0 or "". Default is
disabled.
              The histogram statistics are only printed if replies  were
sent
              during  the  statistics  interval,  requestlist  statistics
are
              printed for every interval (but can be 0).  This is because
the
              median calculation requires data to be present.

       statistics-cumulative: <yes or no>
              If  enabled,  statistics  are cumulative since starting
unbound,
              without clearing the statistics counters after logging the
sta-
              tistics. Default is no.
```

```
       extended-statistics: <yes or no>
              If  enabled,  extended  statistics are printed from unbound-
con-
              trol(8).  Default is off, because keeping track of more
statis-
              tics takes time.  The counters are listed in unbound-
control(8).

       num-threads: <number>
              The  number  of threads to create to serve clients. Use 1 for
no
              threading.

       port: <port number>
              The port number, default 53, on which  the  server  responds
to
              queries.

       interface: <ip address[@port]>
              Interface  to  use  to connect to the network. This interface
is
              listened to for queries from clients, and answers to clients
are
              given  from  it.  Can be given multiple times to work on
several
              interfaces. If none are given the default is to listen to
local-
              host.   The  interfaces  are not changed on a reload (kill -
HUP)
              but only on restart.  A port number can be specified with
@port
              (without spaces between interface and port number), if not
spec-
              ified the default port (from port) is used.

       ip-address: <ip address[@port]>
              Same as interface: (for easy of compatibility with nsd.conf).

       interface-automatic: <yes or no>
              Detect source interface on UDP queries and copy them to
replies.
              This  feature  is experimental, and needs support in your OS
for
              particular socket options.  Default value is no.

       outgoing-interface: <ip address>
              Interface to use to connect to the network.  This  interface
is
              used  to send queries to authoritative servers and receive
their
```

```
              replies. Can be given multiple times to work on  several
inter-
              faces.  If  none  are  given  the default (all) is used. You
can
              specify the same interfaces in  interface:  and  outgoing-
inter-
              face:  lines,  the  interfaces  are then used for both
purposes.
              Outgoing queries are sent via a  random  outgoing  interface
to
              counter spoofing.

       outgoing-range: <number>
              Number  of ports to open. This number of file descriptors can
be
              opened per thread. Must be at least 1. Default depends  on
com-
              pile options. Larger numbers need extra resources from the
oper-
              ating system.  For performance a a very large value is best,
use
              libevent to make this possible.

       outgoing-port-permit: <port number or range>
              Permit  unbound  to  open this port or range of ports for use
to
              send queries.  A  larger  number  of  permitted  outgoing
ports
              increases  resilience against spoofing attempts. Make sure
these
              ports are not needed by other daemons.  By  default  only
ports
              above 1024 that have not been assigned by IANA are used.  Give
a
              port number or a range of the form "low-high", without spaces.

              The outgoing-port-permit and outgoing-port-avoid statements
are
              processed  in the line order of the config file, adding the
per-
              mitted ports and subtracting the avoided ports from the  set
of
              allowed  ports.   The  processing starts with the non IANA
allo-
              cated ports above 1024 in the set of allowed ports.

       outgoing-port-avoid: <port number or range>
              Do not permit unbound to open this port or range  of  ports
for
              use to send queries. Use this to make sure unbound does not
grab
```

```
              a port that another daemon needs. The port  is  avoided  on
all
              outgoing  interfaces,  both  IP4 and IP6.  By default only
ports
              above 1024 that have not been assigned by IANA are used.  Give
a
              port number or a range of the form "low-high", without spaces.

       outgoing-num-tcp: <number>
              Number  of  outgoing TCP buffers to allocate per thread.
Default
              is 10. If set to 0, or if do-tcp is  "no",  no  TCP  queries
to
              authoritative   servers  are  done.   For  larger
installations
              increasing this value is a good idea.

       incoming-num-tcp: <number>
              Number of incoming TCP buffers to allocate per  thread.
Default
              is  10.  If  set to 0, or if do-tcp is "no", no TCP queries
from
              clients are accepted. For larger installations  increasing
this
              value is a good idea.

       edns-buffer-size: <number>
              Number  of bytes size to advertise as the EDNS reassembly
buffer
              size.  This is the value put into  datagrams  over  UDP
towards
              peers.   The actual buffer size is determined by msg-buffer-
size
              (both for TCP and UDP).  Do not  set  higher  than  that
value.
              Default  is 4096 which is RFC recommended.  If you have
fragmen-
              tation reassembly problems, usually seen  as  timeouts,  then
a
              value of 1480 can fix it.  Setting to 512 bypasses even the
most
              stringent path MTU problems, but is seen as extreme,  since
the
              amount of TCP fallback generated is excessive (probably also
for
              this resolver, consider tuning the outgoing tcp number).

       max-udp-size: <number>
              Maximum UDP response size (not applied to TCP response).
65536
```

```
              disables the udp response size maximum, and uses the choice
from
              the client, always.  Suggested values are 512 to  4096.
Default
              is 4096.

       msg-buffer-size: <number>
              Number  of  bytes  size of the message buffers. Default is
65552
              bytes, enough for 64 Kb packets, the maximum DNS  message
size.
              No  message  larger  than  this  can be sent or received. Can
be
              reduced to use less memory, but some requests for DNS data,
such
              as for huge resource records, will result in a SERVFAIL reply
to
              the client.

       msg-cache-size: <number>
              Number of  bytes  size  of  the  message  cache.  Default  is
4
              megabytes.   A  plain number is in bytes, append 'k', 'm' or
'g'
              for kilobytes, megabytes or  gigabytes  (1024*1024  bytes  in
a
              megabyte).

       msg-cache-slabs: <number>
              Number  of  slabs  in  the message cache. Slabs reduce lock
con-
              tention by threads.  Must be  set  to  a  power  of  2.
Setting
              (close) to the number of cpus is a reasonable guess.

       num-queries-per-thread: <number>
              The  number of queries that every thread will service
simultane-
              ously.  If more queries  arrive  that  need  servicing,  and
no
              queries  can  be  jostled  out  (see  jostle-timeout),  then
the
              queries are dropped. This forces the client to  resend  after
a
              timeout;  allowing  the  server  time  to  work  on the
existing
              queries. Default depends on compile options, 512 or 1024.

       jostle-timeout: <msec>
              Timeout used when the server is very busy.  Set to a value
that
```

```
              usually  results  in one roundtrip to the authority servers.
If
              too many queries arrive, then 50% of the queries are allowed
to
              run  to  completion, and the other 50% are replaced with the
new
              incoming query if  they  have  already  spent  more  than
their
              allowed  time.   This protects against denial of service by
slow
              queries or high query rates.   Default  200  milliseconds.
The
              effect  is  that the qps for long-lasting queries is about
(num-
              queriesperthread / 2) / (average time  for  such  long
queries)
              qps.   The  qps  for  short  queries  can  be about
(numqueries-
              perthread / 2)  /  (jostletimeout  in  whole  seconds)  qps
per
              thread, about (1024/2)*5 = 2560 qps by default.

       delay-close: <msec>
              Extra  delay  for timeouted UDP ports before they are closed,
in
              msec.  Default is 0, and that disables it.  This  prevents
very
              delayed  answer  packets  from  the upstream (recursive)
servers
              from bouncing against closed ports and setting off all  sort
of
              close-port  counters,  with eg. 1500 msec.  When timeouts
happen
              you need extra sockets, it checks the ID and remote IP of
pack-
              ets,  and  unwanted  packets  are  added  to the unwanted
packet
              counter.

       so-rcvbuf: <number>
              If not 0, then set the SO_RCVBUF socket option to get more
buf-
              fer space on UDP port 53 incoming queries.  So that short
spikes
              on busy servers do not drop  packets  (see  counter  in
netstat
              -su).   Default  is 0 (use system value).  Otherwise, the
number
              of bytes to ask for, try "4m" on a busy server.  The OS caps
it
```

```
              at  a  maximum, on linux unbound needs root permission to
bypass
              the limit, or the admin can use  sysctl  net.core.rmem_max.
On
              BSD  change kern.ipc.maxsockbuf in /etc/sysctl.conf.  On
OpenBSD
              change header and recompile kernel. On Solaris ndd -set
/dev/udp
              udp_max_buf 8388608.

       so-sndbuf: <number>
              If  not 0, then set the SO_SNDBUF socket option to get more
buf-
              fer space on UDP port 53 outgoing queries.  This for  very
busy
              servers  handles  spikes  in  answer  traffic,  otherwise
'send:
              resource temporarily unavailable' can  get  logged,  the
buffer
              overrun  is also visible by netstat -su.  Default is 0 (use
sys-
              tem value).  Specify the number of bytes to ask for, try "4m"
on
              a  very  busy  server.   The  OS  caps it at a maximum, on
linux
              unbound needs root permission to bypass the limit, or the
admin
              can  use  sysctl net.core.wmem_max.  On BSD, Solaris changes
are
              similar to so-rcvbuf.

       so-reuseport: <yes or no>
              If yes, then  open  dedicated  listening  sockets  for
incoming
              queries  for  each thread and try to set the SO_REUSEPORT
socket
              option on each  socket.   May  distribute  incoming  queries
to
              threads  more  evenly.  Default is no.  On Linux it is
supported
              in kernels >= 3.9.  On other systems, FreeBSD, OSX it  may
also
              work.   You  can enable it (on any platform and kernel), it
then
              attempts to open the port and passes the option if it was
avail-
              able  at compile time, if that works it is used, if it fails,
it
              continues silently (unless verbosity 3) without the option.

       ip-transparent: <yes or no>
```

```
              If yes, then use IP_TRANSPARENT socket option on  sockets
where
              unbound  is listening for incoming traffic.  Default no.
Allows
              you to bind to non-local interfaces.  For example for  non-
exis-
              tant  IP  addresses  that are going to exist later on, with
host
              failover configuration.  This is a lot like interface-
automatic,
              but  that  one  services all interfaces and with this option
you
              can select which (future) interfaces  unbound  provides
service
              on.   This  option needs unbound to be started with root
permis-
              sions on some systems.

       rrset-cache-size: <number>
              Number of bytes size of the RRset cache. Default is 4
megabytes.
              A  plain  number  is  in bytes, append 'k', 'm' or 'g' for
kilo-
              bytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).

       rrset-cache-slabs: <number>
              Number of slabs in the RRset cache. Slabs reduce lock
contention
              by threads.  Must be set to a power of 2.

       cache-max-ttl: <seconds>
              Time  to  live  maximum  for  RRsets  and messages in the
cache.
              Default is 86400 seconds (1  day).  If  the  maximum  kicks
in,
              responses  to  clients  still get decrementing TTLs based on
the
              original (larger) values.  When the internal  TTL  expires,
the
              cache  item has expired.  Can be set lower to force the
resolver
              to query for data often, and not trust (very large) TTL
values.

       cache-min-ttl: <seconds>
              Time to live minimum for  RRsets  and  messages  in  the
cache.
              Default  is  0.  If the minimum kicks in, the data is cached
for
              longer than the domain owner intended, and thus less queries
```

```
are
              made to look up the data.  Zero makes sure the data in the
cache
              is as the domain owner intended, higher values, especially
more
              than an hour or so, can lead to trouble as the data in the
cache
              does not match up with the actual data any more.

       cache-max-negative-ttl: <seconds>
              Time to live maximum for negative responses, these have a SOA
in
              the authority section that is limited in time.  Default is
3600.

       infra-host-ttl: <seconds>
              Time  to live for entries in the host cache. The host cache
con-
              tains roundtrip timing, lameness and EDNS  support
information.
              Default is 900.

       infra-cache-slabs: <number>
              Number  of  slabs in the infrastructure cache. Slabs reduce
lock
              contention by threads. Must be set to a power of 2.

       infra-cache-numhosts: <number>
              Number of hosts for which  information  is  cached.  Default
is
              10000.

       infra-cache-min-rtt: <msec>
              Lower limit for dynamic retransmit timeout calculation in
infra-
              structure cache. Default is 50 milliseconds. Increase this
value
              if using forwarders needing more time to do recursive name
reso-
              lution.

       do-ip4: <yes or no>
              Enable or disable whether ip4 queries are  answered  or
issued.
              Default is yes.

       do-ip6: <yes or no>
              Enable  or  disable  whether ip6 queries are answered or
issued.
              Default is yes.  If disabled, queries are not answered on
IPv6,
```

```
              and  queries  are  not sent on IPv6 to the internet
nameservers.
              With this option you can disable the ipv6 transport for
sending
              DNS traffic, it does not impact the contents of the DNS
traffic,
              which may have ip4 and ip6 addresses in it.

       do-udp: <yes or no>
              Enable or disable whether UDP queries are  answered  or
issued.
              Default is yes.

       do-tcp: <yes or no>
              Enable  or  disable  whether TCP queries are answered or
issued.
              Default is yes.

       tcp-upstream: <yes or no>
              Enable or disable whether the upstream queries use TCP only
for
              transport.  Default is no.  Useful in tunneling scenarios.

       ssl-upstream: <yes or no>
              Enabled or disable whether the upstream queries use SSL only
for
              transport.  Default is no.  Useful in tunneling scenarios.
The
              SSL contains plain DNS in TCP wireformat.  The other server
must
              support this (see ssl-service-key).

       ssl-service-key: <file>
              If enabled, the server provider SSL service on its TCP
sockets.
              The clients have to use ssl-upstream: yes.  The file is the
pri-
              vate key for the TLS session.  The public certificate is in
the
              ssl-service-pem  file.   Default  is "", turned off.  Requires
a
              restart (a reload is not enough) if changed, because the
private
              key  is  read  while root permissions are held and before
chroot
              (if any).  Normal DNS TCP service  is  not  provided  and
gives
              errors,  this  service is best run with a different port:
config
              or @port suffixes in the interface config.
```

```
       ssl-service-pem: <file>
              The public  key  certificate  pem  file  for  the  ssl
service.
              Default is "", turned off.

       ssl-port: <number>
              The  port  number  on  which to provide TCP SSL service,
default
              853, only interfaces configured with that port number as
@number
              get the SSL service.

       do-daemonize: <yes or no>
              Enable  or  disable  whether  the  unbound server forks into
the
              background as a daemon. Default is yes.

       access-control: <IP netblock> <action>
              The netblock is given as  an  IP4  or  IP6  address  with
/size
              appended  for a classless network block. The action can be
deny,
              refuse, allow, allow_snoop, deny_non_local or
refuse_non_local.
              The  most specific netblock match is used, if none match deny
is
              used.

              The action deny stops queries from hosts from that netblock.

              The action refuse stops queries  too,  but  sends  a  DNS
rcode
              REFUSED error message back.

              The action allow gives access to clients from that netblock.
It
              gives only access for recursion clients (which  is  what
almost
              all clients need).  Nonrecursive queries are refused.

              The  allow  action does allow nonrecursive queries to access
the
              local-data that is configured.  The reason is that this does
not
              involve  the  unbound  server  recursive  lookup  algorithm,
and
              static data is served in the reply.  This supports normal
opera-
              tions  where nonrecursive queries are made for the
authoritative
              data.  For nonrecursive queries any  replies  from  the
```

```
dynamic
              cache are refused.

              The action allow_snoop gives nonrecursive access too.  This
give
              both recursive and non recursive access.  The  name
allow_snoop
              refers  to  cache  snooping,  a  technique  to  use
nonrecursive
              queries to examine the  cache  contents  (for  malicious
acts).
              However,  nonrecursive  queries can also be a valuable
debugging
              tool (when you want to examine the cache contents). In that
case
              use allow_snoop for your administration host.

              By  default only localhost is allowed, the rest is refused.
The
              default is refused, because that is protocol-friendly.  The
DNS
              protocol  is  not designed to handle dropped packets due to
pol-
              icy, and dropping may result  in  (possibly  excessive)
retried
              queries.

              The  deny_non_local  and refuse_non_local settings are for
hosts
              that are only allowed to query for the authoritative local-
data,
              they  are  not  allowed full recursion but only the static
data.
              With deny_non_local, messages that are disallowed  are
dropped,
              with refuse_non_local they receive error code REFUSED.

       chroot: <directory>
              If  chroot  is enabled, you should pass the configfile (from
the
              commandline) as a full path from the original  root.  After
the
              chroot  has been performed the now defunct portion of the
config
              file path is removed to be able to reread  the  config  after
a
              reload.

              All  other  file paths (working dir, logfile, roothints, and
key
```

```
              files) can be specified in several ways:  as  an  absolute
path
              relative  to  the  new  root,  as a relative path to the
working
              directory, or as an absolute path relative to the original
root.
              In  the last case the path is adjusted to remove the unused
por-
              tion.

              The pidfile can be either a relative path to the working
direc-
              tory,  or  an absolute path relative to the original root. It
is
              written just prior to  chroot  and  dropping  permissions.
This
              allows  the pidfile to be /var/run/unbound.pid and the chroot
to
              be /var/unbound, for example.

              Additionally,  unbound  may  need  to  access  /dev/random
(for
              entropy) from inside the chroot.

              If given a chroot is done to the given directory. The default
is
              "/usr/local/etc/unbound". If you give "" no chroot is
performed.

       username: <name>
              If given,  after  binding  the  port  the  user  privileges
are
              dropped.  Default is "unbound". If you give username: "" no
user
              change is performed.

              If this user is not capable of binding  the  port,  reloads
(by
              signal  HUP)  will still retain the opened ports.  If you
change
              the port number in the config file, and  that  new  port
number
              requires  privileges,  then  a  reload  will  fail; a restart
is
              needed.

       directory: <directory>
              Sets  the  working  directory  for  the  program.   Default
is
              "/usr/local/etc/unbound".
```

```
       logfile: <filename>
              If  ""  is given, logging goes to stderr, or nowhere once
daemo-
              nized.  The logfile is appended to, in the following format:
              [seconds since 1970] unbound[pid:tid]: type: message.
              If this option is given, the use-syslog  is  option  is  set
to
              "no".  The logfile is reopened (for append) when the config
file
              is reread, on SIGHUP.

       use-syslog: <yes or no>
              Sets unbound to send log messages to  the  syslogd,  using
sys-
              log(3).   The  log  facility  LOG_DAEMON  is used, with
identity
              "unbound".  The logfile setting is overridden when use-syslog
is
              turned on.  The default is to log to syslog.

       log-time-ascii: <yes or no>
              Sets  logfile  lines to use a timestamp in UTC ascii. Default
is
              no, which prints the seconds since 1970 in brackets.  No
effect
              if  using  syslog,  in  that  case  syslog formats the
timestamp
              printed into the log files.

       log-queries: <yes or no>
              Prints one line per query to the log, with the log timestamp
and
              IP  address, name, type and class.  Default is no.  Note that
it
              takes time to print these lines which makes the server
(signifi-
              cantly)  slower.   Odd  (nonprintable)  characters  in names
are
              printed as '?'.

       pidfile: <filename>
              The  process  id  is   written   to   the   file.   Default
is
              "/usr/local/etc/unbound/unbound.pid".  So,
              kill -HUP `cat /usr/local/etc/unbound/unbound.pid`
              triggers a reload,
              kill -TERM `cat /usr/local/etc/unbound/unbound.pid`
              gracefully terminates.

       root-hints: <filename>
```

```
              Read  the  root  hints from this file. Default is nothing,
using
              builtin hints for the IN class. The file has the format of
zone
              files,  with  root  nameserver  names  and  addresses  only.
The
              default may become outdated, when servers change,  therefore
it
              is good practice to use a root-hints file.

       hide-identity: <yes or no>
              If enabled id.server and hostname.bind queries are refused.

       identity: <string>
              Set  the identity to report. If set to "", the default, then
the
              hostname of the server is returned.

       hide-version: <yes or no>
              If enabled version.server and version.bind queries are
refused.

       version: <string>
              Set the version to report. If set to "", the default,  then
the
              package version is returned.

       target-fetch-policy: <"list of numbers">
              Set  the  target fetch policy used by unbound to determine if
it
              should fetch nameserver target addresses opportunistically.
The
              policy is described per dependency depth.

              The  number  of  values  determines the maximum dependency
depth
              that unbound will pursue in answering a query.  A  value  of
-1
              means to fetch all targets opportunistically for that
dependency
              depth. A value of 0 means to fetch on demand  only.  A
positive
              value fetches that many targets opportunistically.

              Enclose the list between quotes ("") and put spaces between
num-
              bers.  The default is "3 2 1 0 0". Setting all zeroes, "0 0 0
0
              0"  gives  behaviour closer to that of BIND 9, while setting
"-1
              -1 -1 -1 -1" gives behaviour rumoured to be closer  to  that
```

```
of
              BIND 8.

       harden-short-bufsize: <yes or no>
              Very  small  EDNS buffer sizes from queries are ignored.
Default
              is off, since it is legal  protocol  wise  to  send  these,
and
              unbound tries to give very small answers to these queries,
where
              possible.

       harden-large-queries: <yes or no>
              Very large queries are ignored. Default  is  off,  since  it
is
              legal  protocol  wise  to send these, and could be necessary
for
              operation if TSIG or EDNS payload is very large.

       harden-glue: <yes or no>
              Will trust glue only if it  is  within  the  servers
authority.
              Default is on.

       harden-dnssec-stripped: <yes or no>
              Require  DNSSEC  data  for trust-anchored zones, if such data
is
              absent, the zone becomes bogus. If turned  off,  and  no
DNSSEC
              data  is  received  (or the DNSKEY data fails to validate),
then
              the zone is made insecure, this behaves like there is  no
trust
              anchor.  You  could turn this off if you are sometimes behind
an
              intrusive firewall (of some sort) that removes DNSSEC data
from
              packets,  or  a  zone  changes  from signed to unsigned to
badly
              signed often. If turned off you run  the  risk  of  a
downgrade
              attack that disables security for a zone. Default is on.

       harden-below-nxdomain: <yes or no>
              From  draft-vixie-dnsext-resimprove, returns nxdomain to
queries
              for a name below another name that is already known to be
nxdo-
              main.   DNSSEC  mandates  noerror  for empty nonterminals,
hence
```

```
              this is possible.  Very old software might return  nxdomain
for
              empty  nonterminals  (that usually happen for reverse IP
address
              lookups), and thus may be incompatible with  this.   To  try
to
              avoid  this  only  DNSSEC-secure nxdomains are used, because
the
              old software does not have DNSSEC.  Default is off.

       harden-referral-path: <yes or no>
              Harden the referral path by performing  additional  queries
for
              infrastructure data.  Validates the replies if trust anchors
are
              configured and the zones are signed.  This enforces DNSSEC
vali-
              dation  on  nameserver NS sets and the nameserver addresses
that
              are encountered on the referral path  to  the  answer.
Default
              off, because it burdens the authority servers, and it is not
RFC
              standard, and could lead to performance problems because of
the
              extra  query  load  that is generated.  Experimental option.
If
              you enable it  consider  adding  more  numbers  after  the
tar-
              get-fetch-policy to increase the max depth that is checked to.

       harden-algo-downgrade: <yes or no>
              Harden  against algorithm downgrade when multiple algorithms
are
              advertised in the DS record.  If no, allows  the  weakest
algo-
              rithm  to  validate the zone.  Default is no.  Zone signers
must
              produce zones that allow this feature  to  work,  but
sometimes
              they  do not, and turning this option off avoids that
validation
              failure.

       use-caps-for-id: <yes or no>
              Use  0x20-encoded  random  bits  in  the  query  to  foil
spoof
              attempts.   This  perturbs  the lowercase and uppercase of
query
              names sent to authority servers and checks if  the  reply
still
```

```
              has  the  correct casing.  Disabled by default.  This feature
is
              an experimental implementation of draft dns-0x20.

       caps-whitelist: <domain>
              Whitelist the domain so that it  does  not  receive  caps-for-
id
              perturbed  queries.   For  domains  that do not support 0x20
and
              also fail with fallback  because  they  keep  sending
different
              answers, like some load balancers.  Can be given multiple
times,
              for different domains.

       private-address: <IP address or subnet>
              Give IPv4 of IPv6 addresses  or  classless  subnets.  These
are
              addresses  on  your  private  network, and are not allowed to
be
              returned for public  internet  names.   Any  occurence  of
such
              addresses are removed from DNS answers. Additionally, the
DNSSEC
              validator may mark the  answers  bogus.  This  protects
against
              so-called  DNS  Rebinding, where a user browser is turned into
a
              network proxy, allowing remote access  through  the  browser
to
              other  parts of your private network.  Some names can be
allowed
              to contain your private addresses, by default all the local-
data
              that  you  configured  is  allowed to, and you can specify
addi-
              tional names using private-domain.   No  private  addresses
are
              enabled  by default.  We consider to enable this for the
RFC1918
              private IP address space by  default  in  later  releases.
That
              would  enable  private  addresses  for  10.0.0.0/8
172.16.0.0/12
              192.168.0.0/16 169.254.0.0/16 fd00::/8 and fe80::/10, since
the
              RFC  standards  say these addresses should not be visible on
the
              public internet.  Turning on 127.0.0.0/8 would hinder many
spam-
```

```
              blocklists as they use that.

       private-domain: <domain name>
              Allow  this  domain,  and  all its subdomains to contain
private
              addresses.  Give multiple times to allow multiple  domain
names
              to contain private addresses. Default is none.

       unwanted-reply-threshold: <number>
              If  set,  a total number of unwanted replies is kept track of
in
              every thread.  When it reaches the threshold, a defensive
action
              is  taken  and  a  warning is printed to the log.  The
defensive
              action is to clear  the  rrset  and  message  caches,
hopefully
              flushing  away  any poison.  A value of 10 million is
suggested.
              Default is 0 (turned off).

       do-not-query-address: <IP address>
              Do not query the given IP address. Can be  IP4  or  IP6.
Append
              /num  to  indicate  a classless delegation netblock, for
example
              like 10.2.3.4/24 or 2001::11/64.

       do-not-query-localhost: <yes or no>
              If yes, localhost is added to the do-not-query-address
entries,
              both  IP6  ::1 and IP4 127.0.0.1/8. If no, then localhost can
be
              used to send queries to. Default is yes.

       prefetch: <yes or no>
              If yes, message cache elements are prefetched before they
expire
              to  keep  the  cache  up to date.  Default is no.  Turning it
on
              gives about 10 percent more traffic and load on the machine,
but
              popular items do not expire from the cache.

       prefetch-key: <yes or no>
              If  yes,  fetch  the  DNSKEYs earlier in the validation
process,
              when a DS record is encountered.  This  lowers  the  latency
of
              requests.   It does use a little more CPU.  Also if the cache
```

```
is
              set to 0, it is no use. Default is no.

       rrset-roundrobin: <yes or no>
              If yes, Unbound rotates RRSet order in response (the random
num-
              ber  is  taken  from the query ID, for speed and thread
safety).
              Default is no.

       minimal-responses: <yes or no>
              If yes, Unbound  doesn't  insert  authority/additional
sections
              into  response  messages  when  those sections are not
required.
              This reduces response size  significantly,  and  may  avoid
TCP
              fallback  for  some responses.  This may cause a slight
speedup.
              The default is no, because the DNS protocol RFCs  mandate
these
              sections,  and  the  additional content could be of use and
save
              roundtrips for clients.

       module-config: <"module names">
              Module configuration, a list of module names separated  by
spa-
              ces,  surround  the  string with quotes (""). The modules can
be
              validator, iterator.  Setting this to "iterator" will result
in
              a  non-validating  server.  Setting this to "validator
iterator"
              will turn on DNSSEC validation.  The ordering of the modules
is
              important.  You must also set trust-anchors for validation to
be
              useful.

       trust-anchor-file: <filename>
              File with trusted  keys  for  validation.  Both  DS  and
DNSKEY
              entries  can  appear  in the file. The format of the file is
the
              standard DNS Zone file format.   Default  is  "",  or  no
trust
              anchor file.

       auto-trust-anchor-file: <filename>
```

```
              File  with  trust  anchor  for  one  zone, which is tracked
with
              RFC5011 probes.  The probes are several times  per  month,
thus
              the  machine must be online frequently.  The initial file can
be
              one with contents as described in trust-anchor-file.   The
file
              is  written  to  when the anchor is updated, so the unbound
user
              must have write permission.

       trust-anchor: <"Resource Record">
              A DS or DNSKEY RR for a key  to  use  for  validation.
Multiple
              entries  can be given to specify multiple trusted keys, in
addi-
              tion to the trust-anchor-files.  The resource record is
entered
              in  the  same  format  as 'dig' or 'drill' prints them, the
same
              format as in the zone file. Has to be on a single line, with
""
              around it. A TTL can be specified for ease of cut and paste,
but
              is ignored.  A class can be specified, but class IN is
default.

       trusted-keys-file: <filename>
              File with trusted keys for validation.  Specify  more  than
one
              file   with   several   entries,   one   file  per  entry.
Like
              trust-anchor-file but has a different  file  format.  Format
is
              BIND-9  style  format,  the  trusted-keys { name flag proto
algo
              "key"; }; clauses are read.  It is  possible  to  use
wildcards
              with  this  statement,  the wildcard is expanded on start and
on
              reload.

       dlv-anchor-file: <filename>
              This option was used during early days DNSSEC deployment when
no
              parent-side  DS  record  registrations  were  easily
available.
              Nowadays, it is best to have DS records registered with the
par-
              ent  zone  (many top level zones are signed).  File with
```

```
trusted
              keys for DLV (DNSSEC Lookaside Validation). Both DS  and
DNSKEY
              entries  can  be  used  in  the  file, in the same format as
for
              trust-anchor-file: statements. Only one DLV can  be
configured,
              more would be slow. The DLV configured is used as a root
trusted
              DLV, this means that it is a lookaside for the root. Default
is
              "",  or  no dlv anchor file.  DLV is going to be
decommissioned.
              Please do not use it any more.

       dlv-anchor: <"Resource Record">
              Much like trust-anchor, this is a DLV  anchor  with  the  DS
or
              DNSKEY  inline.   DLV  is going to be decommissioned.  Please
do
              not use it any more.

       domain-insecure: <domain name>
              Sets domain name to  be  insecure,  DNSSEC  chain  of  trust
is
              ignored  towards  the  domain name.  So a trust anchor above
the
              domain name can not make the domain secure  with  a  DS
record,
              such  a  DS  record  is  then  ignored.   Also keys from DLV
are
              ignored for the domain.  Can be given multiple times to
specify
              multiple  domains  that  are treated as if unsigned.  If you
set
              trust anchors for the domain they override this setting (and
the
              domain is secured).

              This  can  be useful if you want to make sure a trust anchor
for
              external lookups does not affect an (unsigned) internal
domain.
              A  DS  record externally can create validation failures for
that
              internal domain.

       val-override-date: <rrsig-style date spec>
              Default is "" or "0", which disables this debugging feature.
If
```

```
              enabled by giving a RRSIG style date, that date is used for
ver-
              ifying RRSIG inception and expiration dates, instead of the
cur-
              rent  date.  Do  not set this unless you are debugging
signature
              inception and expiration. The value -1 ignores  the  date
alto-
              gether, useful for some special applications.

       val-sig-skew-min: <seconds>
              Minimum  number  of  seconds of clock skew to apply to
validated
              signatures.  A value of 10% of the signature  lifetime
(expira-
              tion  -  inception) is used, capped by this setting.  Default
is
              3600 (1 hour) which allows  for  daylight  savings
differences.
              Lower  this value for more strict checking of short lived
signa-
              tures.

       val-sig-skew-max: <seconds>
              Maximum number of seconds of clock skew to  apply  to
validated
              signatures.   A  value of 10% of the signature lifetime
(expira-
              tion - inception) is used, capped by this setting.   Default
is
              86400  (24  hours) which allows for timezone setting problems
in
              stable domains.  Setting both min and max very low disables
the
              clock skew allowances.  Setting both min and max very high
makes
              the validator check the signature timestamps less strictly.

       val-bogus-ttl: <number>
              The time to live for bogus data. This is data  that  has
failed
              validation;  due  to invalid signatures or other checks. The
TTL
              from that data  cannot  be  trusted,  and  this  value  is
used
              instead. The value is in seconds, default 60.  The time
interval
              prevents repeated revalidation of bogus data.

       val-clean-additional: <yes or no>
              Instruct the validator to remove data from the  additional
```

```
sec-
              tion  of  secure messages that are not signed properly.
Messages
              that are insecure, bogus, indeterminate  or  unchecked  are
not
              affected.  Default is yes. Use this setting to protect the
users
              that rely on this validator for authentication from
protentially
              bad data in the additional section.

       val-log-level: <number>
              Have  the  validator  print  validation  failures  to  the
log.
              Regardless of the verbosity setting.  Default is 0, off.  At
1,
              for  every  user query that fails a line is printed to the
logs.
              This way you can monitor what happens with  validation.   Use
a
              diagnosis tool, such as dig or drill, to find out why
validation
              is failing for these queries.  At 2, not  only  the  query
that
              failed is printed but also the reason why unbound thought it
was
              wrong and which server sent the faulty data.

       val-permissive-mode: <yes or no>
              Instruct the validator to mark bogus messages as
indeterminate.
              The  security  checks  are performed, but if the result is
bogus
              (failed security), the reply is not  withheld  from  the
client
              with  SERVFAIL as usual. The client receives the bogus data.
For
              messages that are found to be  secure  the  AD  bit  is  set
in
              replies.  Also logging is performed as for full validation.
The
              default value is "no".

       ignore-cd-flag: <yes or no>
              Instruct unbound to ignore the CD flag from clients  and
refuse
              to  return  bogus  answers to them.  Thus, the CD (Checking
Dis-
              abled) flag does not disable checking any more.  This is
useful
```

```
              if  legacy (w2008) servers that set the CD flag but cannot
vali-
              date DNSSEC themselves are the clients, and  then  unbound
pro-
              vides them with DNSSEC protection.  The default value is "no".

       val-nsec3-keysize-iterations: <"list of values">
              List of keysize and iteration count values, separated by
spaces,
              surrounded by quotes. Default is "1024 150 2048 500 4096
2500".
              This determines the maximum allowed NSEC3 iteration count
before
              a message is simply marked insecure instead  of  performing
the
              many hashing iterations. The list must be in ascending order
and
              have at least one entry. If you set it to "1024 65535" there
is
              no  restriction  to  NSEC3 iteration values.  This table must
be
              kept short; a very long list could cause slower operation.

       add-holddown: <seconds>
              Instruct the auto-trust-anchor-file probe mechanism for
RFC5011
              autotrust  updates to add new trust anchors only after they
have
              been visible for this time.  Default is 30 days as per the
RFC.

       del-holddown: <seconds>
              Instruct the auto-trust-anchor-file probe mechanism for
RFC5011
              autotrust  updates  to  remove  revoked trust anchors after
they
              have been kept in the revoked list for this long.  Default is
30
              days as per the RFC.

       keep-missing: <seconds>
              Instruct  the auto-trust-anchor-file probe mechanism for
RFC5011
              autotrust updates to remove missing  trust  anchors  after
they
              have  been  unseen for this long.  This cleans up the state
file
              if the target zone does not perform trust anchor revocation,
so
              this makes the auto probe mechanism work with zones that
perform
```

```
              regular (non-5011) rollovers.  The default  is  366  days.
The
              value 0 does not remove missing anchors, as per the RFC.

       permit-small-holddown: <yes or no>
              Debug  option  that allows the autotrust 5011 rollover timers
to
              assume very small values.  Default is no.

       key-cache-size: <number>
              Number of bytes size of the key cache. Default is  4
megabytes.
              A  plain  number  is  in bytes, append 'k', 'm' or 'g' for
kilo-
              bytes, megabytes or gigabytes (1024*1024 bytes in a megabyte).

       key-cache-slabs: <number>
              Number of slabs in the key cache. Slabs reduce  lock
contention
              by threads.  Must be set to a power of 2. Setting (close) to
the
              number of cpus is a reasonable guess.

       neg-cache-size: <number>
              Number of bytes size of the aggressive negative  cache.
Default
              is  1  megabyte.  A plain number is in bytes, append 'k', 'm'
or
              'g' for kilobytes, megabytes or gigabytes (1024*1024 bytes in
a
              megabyte).

       unblock-lan-zones: <yesno>
              Default  is  disabled.   If  enabled,  then  for private
address
              space, the reverse lookups are no longer filtered.  This
allows
              unbound  when running as dns service on a host where it
provides
              service for that host, to put out all of  the  queries  for
the
              'lan' upstream.  When enabled, only localhost, 127.0.0.1
reverse
              and ::1 reverse zones are configured with default  local
zones.
              Disable the option when unbound is running as a (DHCP-) DNS
net-
              work resolver for a group of machines, where such lookups
should
              be  filtered  (RFC  compliance),  this also stops potential
```

```
data
              leakage about the local network to the upstream DNS servers.

       local-zone: <zone> <type>
              Configure a local zone. The type determines the answer  to
give
              if  there  is  no  match  from  local-data.  The types are
deny,
              refuse, static, transparent, redirect, nodefault,
typetranspar-
              ent,  inform,  inform_deny,  and are explained below. After
that
              the default settings are listed. Use local-data: to  enter
data
              into  the  local zone. Answers for local zones are
authoritative
              DNS answers. By default the zones are class IN.

              If you need more complicated authoritative data, with
referrals,
              wildcards, CNAME/DNAME support, or DNSSEC authoritative
service,
              setup a stub-zone for it as detailed in the  stub  zone
section
              below.

            deny Do  not  send an answer, drop the query.  If there is a
match
                 from local data, the query is answered.

            refuse
                 Send an error message reply, with rcode REFUSED.  If there
is
                 a match from local data, the query is answered.

            static
                 If  there  is a match from local data, the query is
answered.
                 Otherwise, the query is answered  with  nodata  or
nxdomain.
                 For  a  negative  answer  a  SOA is included in the answer
if
                 present as local-data for the zone apex domain.

            transparent
                 If there is a match from local data, the query  is
answered.
                 Otherwise  if  the  query  has a different name, the query
is
                 resolved normally.  If the query  is  for  a  name  given
in
```

```
                    localdata  but  no  such  type of data is given in
localdata,
                    then a noerror nodata answer is returned.  If  no  local-
zone
                    is  given  local-data causes a transparent zone to be
created
                    by default.

               typetransparent
                    If there is a match from local data, the query  is
answered.
                    If  the  query  is for a different name, or for the same
name
                    but for a different type, the  query  is  resolved
normally.
                    So,  similar  to transparent but types that are not listed
in
                    local data are resolved normally, so if an A record is in
the
                    local  data  that  does  not  cause  a  nodata reply for
AAAA
                    queries.

               redirect
                    The query is answered from the local data for the zone
name.
                    There  may  be  no  local  data  beneath the zone name.
This
                    answers queries for the zone, and all subdomains of the
zone
                    with the local data for the zone.  It can be used to
redirect
                    a domain to return a different  address  record  to  the
end
                    user,    with   local-zone:   "example.com."   redirect
and
                    local-data: "example.com. A 127.0.0.1" queries for
www.exam-
                    ple.com and www.foo.example.com are redirected, so that
users
                    with web browsers  cannot  access  sites  with  suffix
exam-
                    ple.com.

               inform
                    The  query  is  answered  normally.   The  client  IP
address
                    (@portnumber) is printed to the logfile.  The log message
is:
                    timestamp,  unbound-pid, info: zonename inform IP@port
```

```
query-
                name type class.  This option can be used for normal
resolu-
                tion,  but machines looking up infected names are logged,
eg.
                to run antivirus on them.

            inform_deny
                The query is dropped, like 'deny', and logged, like
'inform'.
                Ie. find infected machines without answering the queries.

            nodefault
                Used  to turn off default contents for AS112 zones. The
other
                types also turn off default contents for the zone. The
'node-
                fault'  option  has  no other effect than turning off
default
                contents for the  given  zone.   Use  nodefault  if  you
use
                exactly  that  zone, if you want to use a subzone, use
trans-
                parent.

       The default zones are localhost, reverse 127.0.0.1  and  ::1,  and
the
       AS112  zones. The AS112 zones are reverse DNS zones for private use
and
       reserved IP addresses for which the servers on the internet cannot
pro-
       vide  correct  answers. They are configured by default to give
nxdomain
       (no reverse information) answers. The defaults can  be  turned  off
by
       specifying  your  own local-zone of that name, or using the
'nodefault'
       type. Below is a list of the default zone contents.

            localhost
                The IP4 and IP6 localhost information is given.  NS  and
SOA
                records are provided for completeness and to satisfy some
DNS
                update tools. Default content:
                local-zone: "localhost." static
                local-data: "localhost. 10800 IN NS localhost."
                local-data: "localhost. 10800 IN
                    SOA localhost. nobody.invalid. 1 3600 1200 604800
10800"
                local-data: "localhost. 10800 IN A 127.0.0.1"
```

```
                local-data: "localhost. 10800 IN AAAA ::1"

            reverse IPv4 loopback
                Default content:
                local-zone: "127.in-addr.arpa." static
                local-data: "127.in-addr.arpa. 10800 IN NS localhost."
                local-data: "127.in-addr.arpa. 10800 IN
                    SOA localhost. nobody.invalid. 1 3600 1200 604800
10800"
                local-data: "1.0.0.127.in-addr.arpa. 10800 IN
                    PTR localhost."

            reverse IPv6 loopback
                Default content:
                local-zone: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                    0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa." static
                local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                    0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                    NS localhost."
                local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                    0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                    SOA localhost. nobody.invalid. 1 3600 1200 604800
10800"
                local-data: "1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
                    0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa. 10800 IN
                    PTR localhost."

            reverse RFC1918 local use zones
                Reverse data for zones  10.in-addr.arpa,  16.172.in-
addr.arpa
                to     31.172.in-addr.arpa,     168.192.in-addr.arpa.
The
                local-zone: is set static  and  as  local-data:  SOA  and
NS
                records are provided.

            reverse RFC3330 IP4 this, link-local, testnet and broadcast
                Reverse  data for zones 0.in-addr.arpa, 254.169.in-
addr.arpa,
                2.0.192.in-addr.arpa (TEST  NET  1),  100.51.198.in-
addr.arpa
                (TEST   NET   2),   113.0.203.in-addr.arpa   (TEST   NET
3),
                255.255.255.255.in-addr.arpa.  And  from  64.100.in-
addr.arpa
                to 127.100.in-addr.arpa (Shared Address Space).

            reverse RFC4291 IP6 unspecified
                Reverse data for zone
                0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
```

```
               0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa.

            reverse RFC4193 IPv6 Locally Assigned Local Addresses
               Reverse data for zone D.F.ip6.arpa.

            reverse RFC4291 IPv6 Link Local Addresses
               Reverse data for zones 8.E.F.ip6.arpa to B.E.F.ip6.arpa.

            reverse IPv6 Example Prefix
               Reverse  data for zone 8.B.D.0.1.0.0.2.ip6.arpa. This zone
is
               used for tutorials and examples. You can remove the block
on
               this zone with:
                 local-zone: 8.B.D.0.1.0.0.2.ip6.arpa. nodefault
               You can also selectively unblock a part of the zone by
making
               that part transparent with a local-zone statement.  This
also
               works with the other default zones.

       local-data: "<resource record string>"
            Configure  local data, which is served in reply to queries for
it.
            The query has to match exactly unless you configure the local-
zone
            as  redirect.  If  not matched exactly, the local-zone type
deter-
            mines further processing. If local-data is configured that is
not
            a  subdomain  of a local-zone, a transparent local-zone is
config-
            ured.  For record types such as TXT,  use  single  quotes,  as
in
            local-data: 'example. TXT "text"'.

            If  you  need more complicated authoritative data, with
referrals,
            wildcards, CNAME/DNAME support, or DNSSEC  authoritative
service,
            setup  a  stub-zone  for  it  as detailed in the stub zone
section
            below.

       local-data-ptr: "IPaddr name"
            Configure local data shorthand for a PTR record with the
reversed
            IPv4  or  IPv6  address and the host name.  For example
"192.0.2.4
            www.example.com".  TTL can be  inserted  like  this:
"2001:DB8::4
```

```
            7200 www.example.com"

       ratelimit: <number or 0>
            Enable  ratelimiting  of queries sent to nameserver for
performing
            recursion.  If 0, the default, it is  disabled.   This  option
is
            experimental at this time.  The ratelimit is in queries per
second
            that are allowed.  More queries are  turned  away  with  an
error
            (servfail).   This stops recursive floods, eg. random query
names,
            but not spoofed reflection floods.  Cached responses are not
rate-
            limited  by  this setting.  The zone of the query is determined
by
            examining the nameservers for it, the zone name is  used  to
keep
            track  of  the rate.  For example, 1000 may be a suitable value
to
            stop the server from being overloaded with random names, and
keeps
            unbound from sending traffic to the nameservers for those zones.

       ratelimit-size: <memory size>
            Give  the  size of the data structure in which the current
ongoing
            rates are kept track in.  Default 4m.  In bytes  or  use
m(mega),
            k(kilo),  g(giga).  The ratelimit structure is small, so this
data
            structure likely does not need to be large.

       ratelimit-slabs: <number>
            Give power of 2 number of slabs, this is used to reduce lock
con-
            tention  in  the  ratelimit tracking data structure.  Close to
the
            number of cpus is a fairly good setting.

       ratelimit-factor: <number>
            Set the amount  of  queries  to  rate  limit  when  the  limit
is
            exceeded.   If set to 0, all queries are dropped for domains
where
            the limit is exceeded.  If set to another value, 1 in that
number
            is  allowed  through  to  complete.   Default is 10, allowing
1/10
```

```
            traffic to flow normally.  This can make ordinary queries
complete
            (if  repeatedly  queried  for),  and  enter the cache, whilst
also
            mitigiting the traffic flow by the factor given.

       ratelimit-for-domain: <domain> <number qps>
            Override the global ratelimit for an exact match domain name
with
            the  listed  number.   You  can give this for any number of
names.
            For example, for a top-level-domain you may want to have a
higher
            limit than other names.

       ratelimit-below-domain: <domain> <number qps>
            Override  the global ratelimit for a domain name that ends in
this
            name.  You can give this multiple times, it then describes
differ-
            ent  settings  in  different  parts of the namespace.  The
closest
            matching suffix is used to determine the qps limit.  The rate
for
            the   exact  matching  domain  name  is  not  changed,  use
rate-
            limit-for-domain to set that, you might want to use different
set-
            tings for a top-level-domain and subdomains.

   Remote Control Options
       In  the remote-control: clause are the declarations for the remote
con-
       trol facility.  If this is enabled, the unbound-control(8) utility
can
       be  used  to  send  commands to the running unbound server.  The
server
       uses these clauses to setup SSLv3 / TLSv1 security for the
connection.
       The  unbound-control(8)  utility  also reads the remote-control
section
       for options.  To setup the correct  self-signed  certificates  use
the
       unbound-control-setup(8) utility.

       control-enable: <yes or no>
            The  option is used to enable remote control, default is "no".
If
            turned off, the server does not listen for control commands.

       control-interface: <ip address or path>
```

```
            Give IPv4 or IPv6 addresses or local socket path to listen on
for
            control  commands.   By  default  localhost (127.0.0.1 and ::1)
is
            listened to.  Use 0.0.0.0 and ::0 to listen to all interfaces.
If
            you  change  this  and  permissions  have  been  dropped, you
must
            restart the server for the change to take effect.

       control-port: <port number>
            The port number to listen on for IPv4 or IPv6 control
interfaces,
            default  is  8953.   If  you change this and permissions have
been
            dropped, you must restart  the  server  for  the  change  to
take
            effect.

       control-use-cert: <yes or no>
            Whether  to  require certificate authentication of control
connec-
            tions.  The default is "yes".  This should not be  changed
unless
            there  are  other  mechanisms  in place to prevent untrusted
users
            from accessing the remote control interface.

       server-key-file: <private key file>
            Path to the server private  key,  by  default
unbound_server.key.
            This file is generated by the unbound-control-setup utility.
This
            file is used by the unbound server, but not by unbound-control.

       server-cert-file: <certificate file.pem>
            Path  to  the  server  self   signed   certificate,   by
default
            unbound_server.pem.   This  file  is generated by the unbound-
con-
            trol-setup utility.  This file is used by the unbound server,
and
            also by unbound-control.

       control-key-file: <private key file>
            Path  to  the  control client private key, by default
unbound_con-
            trol.key.  This file is  generated  by  the  unbound-control-
setup
            utility.  This file is used by unbound-control.
```

```
       control-cert-file: <certificate file.pem>
            Path  to  the  control client certificate, by default
unbound_con-
            trol.pem.  This certificate has to be signed with the server
cer-
            tificate.   This  file  is  generated by the unbound-control-
setup
            utility.  This file is used by unbound-control.

   Stub Zone Options
       There may be multiple stub-zone: clauses. Each with a name: and zero
or
       more  hostnames  or IP addresses.  For the stub zone this list of
name-
       servers is used. Class IN is assumed.  The servers should be
authority
       servers,  not  recursors;  unbound  performs  the  recursive
processing
       itself for stub zones.

       The stub zone can be used to configure authoritative data to be used
by
       the resolver that cannot be accessed using the public internet
servers.
       This is useful for  company-local  data  or  private  zones.  Setup
an
       authoritative  server  on a different host (or different port). Enter
a
       config entry for unbound with stub-addr: <ip address  of
host[@port]>.
       The unbound resolver can then access the data, without referring to
the
       public internet for it.

       This setup allows DNSSEC signed zones to be served by  that
authorita-
       tive  server, in which case a trusted key entry with the public key
can
       be put in config, so that unbound can validate the data and set the
AD
       bit  on  replies for the private zone (authoritative servers do not
set
       the AD bit).  This setup makes unbound capable of answering queries
for
       the private zone, and can even set the AD bit ('authentic'), but the
AA
       ('authoritative') bit is not set on these replies.

       Consider  adding  server:  statements  for  domain-insecure:  and
for
       local-zone: name nodefault for the zone if it is a locally served
```

```
zone.
       The insecure clause stops DNSSEC from invalidating the zone.  The
local
       zone nodefault (or transparent) clause makes the (reverse-) zone
bypass
       unbound's filtering of RFC1918 zones.

       name: <domain name>
              Name of the stub zone.

       stub-host: <domain name>
              Name of stub zone nameserver. Is itself resolved  before  it
is
              used.

       stub-addr: <IP address>
              IP address of stub zone nameserver. Can be IP 4 or IP 6.  To
use
              a nondefault port for DNS communication append '@' with the
port
              number.

       stub-prime: <yes or no>
              This  option  is  by default off.  If enabled it performs NS
set
              priming, which is similar to root hints, where it  starts
using
              the  list of nameservers currently published by the zone.
Thus,
              if the hint list is slightly outdated, the resolver picks  up
a
              correct list online.

       stub-first: <yes or no>
              If  enabled,  a query is attempted without the stub clause if
it
              fails.  The data could not be retrieved and  would  have
caused
              SERVFAIL  because  the  servers  are  unreachable, instead it
is
              tried without this clause.  The default is no.

   Forward Zone Options
       There may be multiple forward-zone: clauses. Each with a name: and
zero
       or  more  hostnames or IP addresses.  For the forward zone this list
of
       nameservers is used to forward the queries to. The  servers  listed
as
       forward-host:  and  forward-addr:  have to handle further recursion
```

```
for
       the query.  Thus, those servers are  not  authority  servers,  but
are
       (just  like unbound is) recursive servers too; unbound does not
perform
       recursion itself for the forward zone, it lets the remote server do
it.
       Class  IN  is  assumed.   A forward-zone entry with name "." and a
for-
       ward-addr target will forward all queries to that other server
(unless
       it can answer from the cache).

       name: <domain name>
              Name of the forward zone.

       forward-host: <domain name>
              Name  of  server  to forward to. Is itself resolved before it
is
              used.

       forward-addr: <IP address>
              IP address of server to forward to. Can be IP 4 or IP 6.  To
use
              a nondefault port for DNS communication append '@' with the
port
              number.

       forward-first: <yes or no>
              If enabled, a query is attempted without the forward  clause
if
              it fails.  The data could not be retrieved and would have
caused
              SERVFAIL because the servers  are  unreachable,  instead  it
is
              tried without this clause.  The default is no.

   Python Module Options
       The  python: clause gives the settings for the python(1) script
module.
       This module acts like the iterator and validator modules do, on
queries
       and  answers.   To  enable the script module it has to be compiled
into
       the daemon, and the word "python" has to be put in  the  module-
config:
       option (usually first, or between the validator and iterator).

       python-script: <python file>
              The script file to load.
```

```
   DNS64 Module Options
       The  dns64  module must be configured in the module-config: "dns64
val-
       idator iterator" directive and  be  compiled  into  the  daemon  to
be
       enabled.  These settings go in the server: section.

       dns64-prefix: <IPv6 prefix>
              This  sets  the  DNS64  prefix to use to synthesize AAAA
records
              with.  It must  be  /96  or  shorter.   The  default  prefix
is
              64:ff9b::/96.

       dns64-synthall: <yes or no>
              Debug  option,  default  no.   If  enabled,  synthesize all
AAAA
              records despite the presence of actual AAAA records.

MEMORY CONTROL EXAMPLE
       In the example config settings below memory usage is reduced. Some
ser-
       vice  levels are lower, notable very large data and a high TCP load
are
       no longer supported. Very large data and high TCP loads are
exceptional
       for the DNS.  DNSSEC validation is enabled, just add trust anchors.
If
       you do not have to worry about programs using more than 3 Mb of
memory,
       the below example is not for you. Use the defaults to receive full
ser-
       vice, which on BSD-32bit tops out at 30-40 Mb after heavy usage.

       # example settings that reduce memory usage
       server:
            num-threads: 1
            outgoing-num-tcp: 1 # this limits TCP service, uses less
buffers.
            incoming-num-tcp: 1
            outgoing-range: 60  # uses less memory, but less performance.
            msg-buffer-size: 8192   # note this limits service, 'no huge
stuff'.
            msg-cache-size: 100k
            msg-cache-slabs: 1
            rrset-cache-size: 100k
            rrset-cache-slabs: 1
            infra-cache-numhosts: 200
            infra-cache-slabs: 1
            key-cache-size: 100k
```

```
            key-cache-slabs: 1
            neg-cache-size: 10k
            num-queries-per-thread: 30
            target-fetch-policy: "2 1 0 0 0 0"
            harden-large-queries: "yes"
            harden-short-bufsize: "yes"

FILES
       /usr/local/etc/unbound
              default unbound working directory.

       /usr/local/etc/unbound
              default chroot(2) location.

       /usr/local/etc/unbound/unbound.conf
              unbound configuration file.

       /usr/local/etc/unbound/unbound.pid
              default unbound pidfile with process ID of the running daemon.

       unbound.log
              unbound log file. default is to log to syslog(3).
```

Voir aussi

- **(en)** page de man : unbound.conf(5)

Contributeurs principaux : Jamaique.

Basé sur unbound.conf(5)

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