NAME

sc_rxifd — respond with receive interface name in a DNS TXT packet

SYNOPSIS

sc_rxifd [-?46Dv] [-n *name*] [-p *pps*] [-P *port*]

DESCRIPTION

The **sc_rxifd** utility provides the ability for a UDP client to determine the interface on a UDP listener that received the packet. This is useful when inferring routing policy. **sc_rxifd** uses DNS as a wire format for queries and responses. The options are as follows:

-?
: prints a list of command line options and a synopsis of each.

-v
: prints the version of **sc_rxifd** and exits.

-D
: causes **sc_rxifd** to operate as a daemon.

-4
: causes **sc_rxifd** to only listen for IPv4-based requests.

-6
: causes **sc_rxifd** to only listen for IPv6-based requests.

-n *name*
: specifies the name that **sc_rxifd** will respond to TXT queries for. **sc_rxifd** will silently ignore non-TXT queries, and TXT queries for names other than the specified name. This is a mandatory parameter.

-p *pps*
: specifies the maximum number of responses per second that **sc_rxifd** can send. This is a mandatory parameter.

-P *port*
: specifies the UDP port to listen for queries on. Typically port 53 requires privilege to listen on, and some networks intercept all UDP port 53 traffic, so it is recommended to choose a higher-numbered port. This is a mandatory parameter.

EXAMPLES

The intended use of **sc_rxifd** is on a multi-homed system where clients could reach IP addresses on the system in different ways. Typically those IP addresses are assigned to the loopback interface. **sc_rxifd** will respond to a TXT query for a specific name with a TXT record that contains the name of the physical interface that received the query, even if that packet were destined to an address assigned to the loopback interface, and the source IP address that **sc_rxifd** saw the query from.

Given **sc_rxifd** listening on port 53535 for TXT queries for rxif.example.net

```
sc_rxifd -P 53535 -n rxif.example.net
```

Then the following query

```
dig @192.0.2.1 rxif.example.net -t txt -p 53535 +short
```

will obtain a response that looks similar to

```
"src=192.0.31.8" "rxif=em0"
```

SIGNAL HANDLERS

sc_rxifd installs handlers for SIGHUP, SIGINT, and SIGTERM. These signals cause **sc_rxifd** to exit gracefully.

SECURITY CONSIDERATIONS

sc_rxifd should always be run by a non-root user.

sc_rxifd provides an amplification opportunity, as a DNS response is typically larger than a DNS query. The size of a response depends on the length of the interface name and the length of the string representation of the source IP address reported.

SEE ALSO

dig(1),

M. Luckie, S. Wallace, K. Newell, J. Bartig, S. Koçak, N. Den Otter, K. Koole, J. Deaton, and k. claffy, *R&E Routing Policy: Inference and Implication*, Proc. ACM/SIGCOMM Internet Measurement Conference 2025.

AUTHORS

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