

# **TCP-Relay**

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# 1 Introduction

**tcprelay** is a TCP connection forwarder with load balancing capabilities. If compiled with TLS support, it may be used as SSL encryption wrapper.

## 1.1 Download

You can download the source code from the GitHub repository at <https://github.com/MarcJHuber/event-driven-servers/>. Documentation is available on the original site, <https://www.pro-bono-publico.de/projects/>, too.

# 2 Operation

This section gives a brief and basic overview how to run **tcprelay**.

In earlier versions, **tcprelay** wasn't a standalone program but had to be invoked by **spawnd**. This has changed, as **spawnd** is now part of the **tcprelay** binary. However, using a dedicated **spawnd** process is still possible and, more importantly, the **spawnd** configuration options and documentation remain valid.

**tcprelay** may use auxilliary **MAVIS** backend modules for authentication and authorization.

## 2.1 Command line syntax

The only mandatory argument is the path to the configuration file:

```
tcprelay [ -P ] [ -d level ] [ -i child_id ] configuration-file [ id ]
```

If the program was compiled with CURL support, *configuration-file* may be an URL.

Keep the **-P** option in mind - it is imperative that the configuration file supplied is syntactically correct, as the daemon won't start if there are any parsing errors at start-up.

The **-d** switch enables debugging. You most likely don't want to use this. Read the source if you need to.

The **-i** option is only honoured if the build-in **spawnd** functionality is used. In that case, it selects the configuration ID for **tcprelay**, while the optional last argument *id* sets the ID of the **spawnd** configuration section.

## 2.2 Signals

Both the master (that's the process running the **spawnd** code) and the child processes (running the **tcprelay** code) intercept the **SIGHUP** signal:

- The master process will restart upon reception of **SIGHUP**, re-reading the configuration file. The child processes will recognize that the master process is no longer available. It will continue to serve the existing connections and terminate when idle.
- If **SIGHUP** is sent to a child process it will stop accepting new connections from its master process. It will continue to serve the existing connections and terminate when idle.

## 2.3 Event mechanism selection

Several level-triggered event mechanisms are supported. By default, the one best suited for your operating system will be used. However, you may use the environment variable **IO\_POLL\_MECHANISM** to select a specific one.

The following event mechanisms are supported (in order of preference):

- port (Sun Solaris 10 and higher only, **IO\_POLL\_MECHANISM=32**)

- `kqueue` (\*BSD and Darwin only, `IO_POLL_MECHANISM=1`)
- `/dev/poll` (Sun Solaris only, `IO_POLL_MECHANISM=2`)
- `epoll` (Linux only, `IO_POLL_MECHANISM=4`)
- `poll` (`IO_POLL_MECHANISM=8`)
- `select` (`IO_POLL_MECHANISM=16`)

Environment variables can be set in the configuration file at top-level:

```
setenv IO_POLL_MECHANISM = 4
```

## 2.4 Configuration Syntax

A single configuration file is sufficient for configuring both **spawnd** and **tcprelay**. The basic format for this file is:

```
id = spawnd {
    # spawnd configuration directives
}

id = tcprelay {
    # tcprelay configuration directives
}
```

For example, the **spawnd** section could look similar to:

```
listen = { port = 80 }
spawn = { exec /usr/local/libexec/tcprelay }
```

This tells **spawnd** to accept connections on the port given, and feed them to a **tcprelay** process. Please see the **spawnd** documentation for more configuration details.

**tcprelay** has its own set of configuration directives:

- `local address = addr`  
Specifies the local address used for outgoing connections.
- `rebalance = n`  
Re-balances peers after *n* requests. May be used to reactivate dead peers. Use with care. Default: unset.
- `remote = { ... }`  
The `remote` sections tell **tcprelay** where to relay connections to. Valid configuration directives inside the curly brackets are:
  - `address = IPAddress`
  - `port = TCPPort`
  - `protocol = ( TCP | SCTP )`
  - `weight = Weight`

Both the `address` and `port` directives are mandatory. The load balancing factor `weight` is optional and defaults to 1. Its value should somehow correspond to the load a destination can handle.
- `retire = count`  
If set, the daemon will terminate after processing *count* sessions, what may be useful to remedy the effects of memory leaks. By default, this is not set.
- `syslog((ident = Ident)|(severity = Level)|(facility = Facility))`  
Selects `syslog` *ident*, *severity* and *facility*. Defaults to:

```

syslog ident = program-name
syslog facility = UUCP
syslog severity = INFO

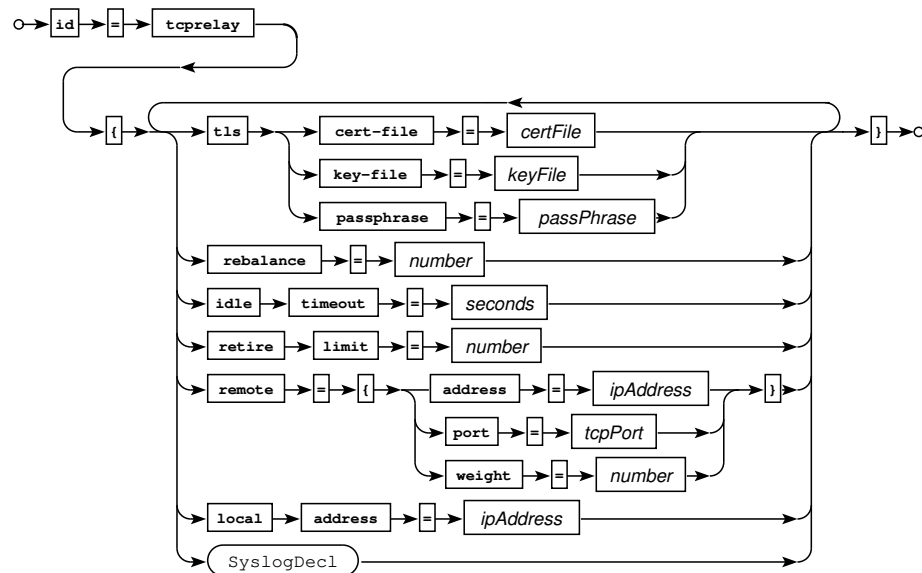
```

- `idle timeout = Seconds`  
Set session timeout (default: 0).

- `tls cert-file = CertFile`  
`tls key-file = KeyFile`  
`tls passphrase = PassPhrase`

If compiled with TLS/SSL, *PassPhrase*, *CertFile* and *KeyFile* may be specified using this option. *KeyFile* may be omitted, it defaults to *CertFile*.

### 2.4.1 Railroad Diagram



Railroad diagram: TcprelayConfig

## 2.5 Sample configuration

```

#!/usr/local/sbin/spawnd
id = spawnd {
    listen = { port = 2222 }
    listen = { address = ::0 port = 2222 }
    listen = { ::0 port = 2224 }
    listen = { port = 2225 tls = yes }
    spawn {
        users max = 4000
        users min = 10
        servers min = 1
        servers max = 20
    }
}

id = tcprelay {
    remote = { address = 169.254.1.2 port = 22 }
}

```

```
ssl cert = /some/where/sample.pem
ssl passphrase = 12345
}
```

### 3 Bugs

- TLS re-negotiation is currently untested and may or may not work.
- There may still be some nasty bugs lurking in the code. Please contact the author via the "Event-Driven Servers" Google Group at [event-driven-servers@googlegroups.com](mailto:event-driven-servers@googlegroups.com) or <http://groups.google.com/group/event-driven-servers> if you think you've found one.

### 4 Copyrights and Acknowledgements

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- **The following applies if the software was compiled with TLS support:**

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>). This product includes cryptographic software written by Eric Young ([ey@cryptsoft.com](mailto:ey@cryptsoft.com)).

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