
vpn extsuperscript2 Documentation

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vpn² is a decentral vpn using the OpenPGP's web of trust model to authenticate peers.

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vpn² makes use of other components either by dynamic or static linking depending on compile time switches. Refer to their licences for further information.

Project Organization

This project uses [GitHub](#) for source code hosting and [Read the Docs](#) for building the documentation.

Obtaining the source code

Since this software is in early stages of development official releases have been made. Release tarballs are not available yet. Nevertheless a zip-snapshot of the current development version can be downloaded via [GitHub](#).

vpn² uses git as version control system. The git repository is available on <https://github.com/joke/vpn>. Feel free to contribute.

Reporting Bugs

Bugs should be reported on the projects <https://github.com/joke/vpn/issues> presence.

Architecture of the vpn

vpn² is a virtual private network software much like the popular [OpenVPN](#). But unlike OpenVPN is based on a peer-to-peer architecture to alleviate the need for central server.

Features

- **Decentral organisation of the vpn**
 - No dedicated server is required

Technical Overview

- vpn² peers use direct (peer-to-peer) connections to communicate between each other
 - Peers operate as client and server altogether
 - No single point of failure
- Direct encrypted connection between peers:
 - UDP transport with TLS encryption using DTLS ([RFC 6347](#))
 - TLS heartbeat extension ([RFC 6520](#)) to
 - * Prevent NAT timeout
 - * Monitor state of peers
- Authentication based on OpenPGP ([RFC 6091](#))
 - Using local GnuPG keyring
 - Trust delegation using trusted signatures
 - OpenPGP's Web-of-Trust algorithm
 - Key exchange during TLS handshake possible
- IPv6 ([RFC 4291](#)) addresses used for addressing vpn² peers
 - Address prefix `fc00::/8` used for vpn²

- Auto address assignment of unique local address (ULA, [RFC 4193](#)) based on OpenPGP certificate hash and `fc00::/64` prefix
- LAN connectivity
 - * Routing of prefix `fc00::/64` between LAN and vpn
 - * Stateless address autoconfiguration (SLAAC, [RFC 4862](#)) of prefix for LAN access
 - * Routing of multicast addresses ([RFC 4291#section-2.7](#)) with site-local scope or link-local scope to support mDNS ([RFC 6762](#))
- Decentral organization
 - No configuration needed
 - Addresses not assigned by central authority
 - Low chance of address conflicts due to IPv6 address space
- Implementation in Userspace
 - C++11 code base
 - GnuTLS encryption
 - Boost.ASIO network library
 - Userspace software using tun/tap kernel support

Building the Software

Software requirements

Several components are required to run `vpn2`. Since this software is in its early stages and has been tested on Fedora 19 (64 bit) only this list is considered incomplete for the time being.

Compiletime requirements

- gcc 4.7.1 with support for c++11.
- **Boost 1.54**
 - Boost ASIO
 - Boost Program Options
 - Boost Serialization
- GnuTLS 3.1.11
- GnuPG Made Easy (GPGME)
- GNU IDN Library (libidn2)
- Sphinx (to build manual)
- Doxygen (to build api documentation)

Runtime requirements

- GnuPG 2.0.0 or later

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