Configuration Guide

INSYS icom

Industrial Data Communication

VPN with INSYS routers

Configuring OpenVPN client with certificate-based authentication under Windows

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1 Introduction

General

The present publication refers to a combination of selected hardware and software components of INSYS icom GmbH as well as other manufacturers. All components have been combined with the target to realize certain results and effects for certain applications in the field of professional data transfer.

All components have been prepared, configured and used as described in this publication. Thus, the desired results and effects have been achieved.

The exact descriptions of all used components, to which this publication refers, are described in the tables *Hardware, Accessories* and *Software* at the end of this publication.

The symbols and formattings used in this publication are explained in the correspondent section at the end of this publication.

Some configurations or preparations, which are precondition in this publication, are described in other publications. Therefore, always refer to the related device manuals. INSYS devices with web interface provide you with helpful information about the configuration possibilities, if you click on "display help text" in the header.

Target of this Publication

A Windows PC can also act as an OpenVPN client in an OpenVPN network.. Refer to http://www.openvpn.eu for further information about OpenVPN.

Use this publication to find out how to set up a Windows PC as OpenVPN client with certificate-based authentication for an OpenVPN network with an INSYS router as OpenVPN server.

The present publication describes the proceeding under Windows 7. Proceed accordingly for an installation under Windows Vista or Windows XP.

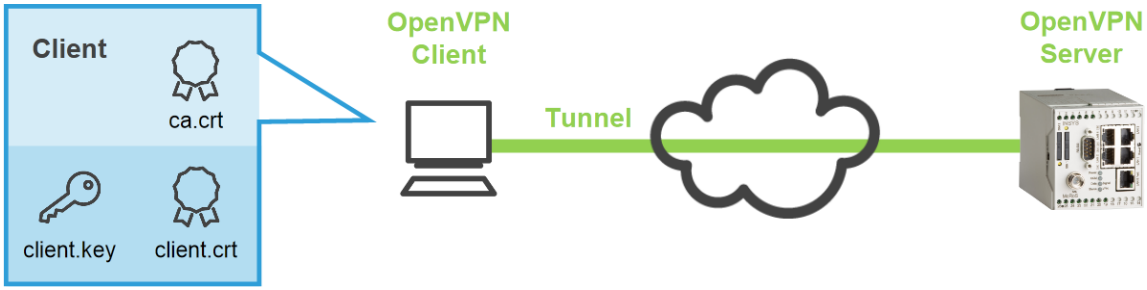


Figure 1: Windows PC as OpenVPN client with certificate-based authentication

2 Configuration

Provisions

Please prepare the following items before starting the configuration:

- **Downloading the OpenVPN Package**
- **Installing the OpenVPN Package on a Windows PC**
- **Creating a Certificate Structure**
- **Configuring an INSYS Router as OpenVPN Server and Display Configuration File**

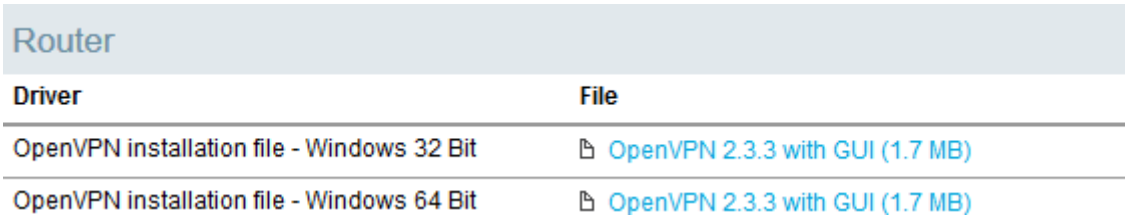
■ Downloading the OpenVPN Package

How to download the OpenVPN package from our website.

→ PC with approx. 1.5 MB free disk space
→ Web browser
→ Internet connection

1. Open http://www.insys-icom.com/driver/ to download the drivers.
2. Click on the link for your Windows version in the "Router" section:

   ⓘ *Refer to Control Panel, System, System section and System type for your Windows version (32 or 64 bit).*



   ⓘ *If a more recent version is available, download this.*

3. Save the file on your PC.

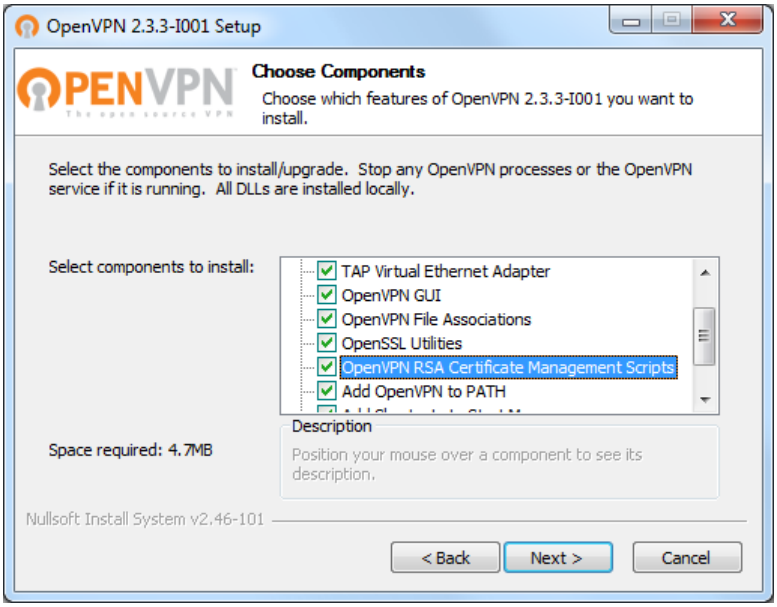
   ✓ You have downloaded the OpenVPN package software with this.

Installing the OpenVPN Package on a Windows PC

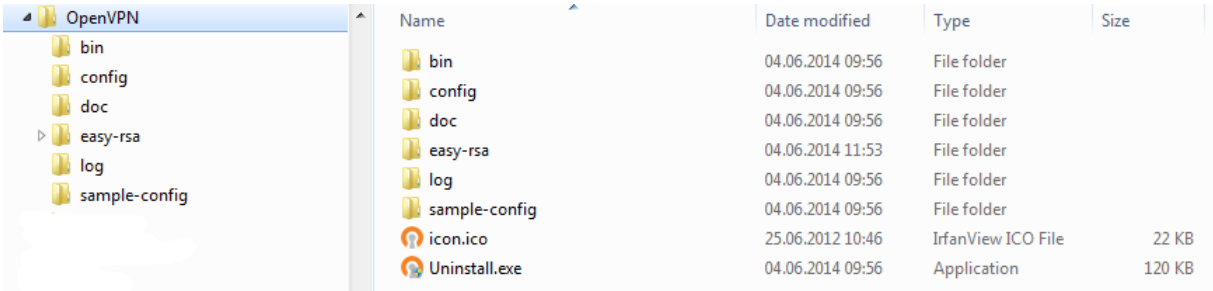
How to install the OpenVPN GUI and the programs for creating the certificates and keys on your PC successfully.

→ You have downloaded the OpenVPN packet (version 2.3.3 or higher) from the INSYS website (www.insys-icom.com/driver).

1. Execute the previously downloaded installation file
   ▶ *If Windows displays a security request, confirm it.*
2. Start the setup wizard and accept the license agreement.
   ✓ The component selection window appears.



3. Check the "OpenVPN RSA Certificate Management Scripts", select Next > and continue the setup wizard.
   ▶ *If a Windows log test warning is displayed, confirm it.*
4. Click on Finish upon completion of the installation.
   ✓ The OpenVPN GUI, the SSL software and the programs for creating the certificates and keys are now in the specified directories (default: C:\Program Files\OpenVPN\).



   ✓ You have successfully installed the OpenVPN package on your PC and completed the provisions with this.

Creating a Certificate Structure

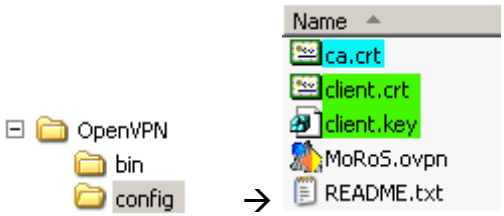
How to create a certificate structure for your application.

1. Create a certificate structure for your application.

   ⓘ *A detailed description of this process can be found in our configuration guides "Creating X509.V3 Certificates for VPNs with easy-rsa" or "Creating X509.V3 Certificates for VPNs with XCA".*

   ✓ You have created a certificate structure consisting of certificates and keys for CA, server and clients.

2. Copy client key and certificate as well as CA certificate into the working directory of the OpenVPN package (default: C:\Program Files\OpenVPN\config).



   ▶ *If you have received a PKCS#12 file that contains certificates and key (e.g. "Client_1.p12"), this already contains all files. Copy this file only to above directory in this case.*

   ✓ The OpenVPN client has the required keys and certificates available with this.

■ Configuring an INSYS Router as OpenVPN Server and Display Configuration File

How to create a configuration file for the OpenVPN client using an INSYS router, which is configured as OpenVPN server. This is the most convenient way to generate a configuration file. Of course, this can also be created manually.

→ You have created a certificate structure for your application.

1. Configure an INSYS router, which shall act as OpenVPN server, according to your application.

   ⓘ *A detailed description about this can be found in the configuration guide "Configuring an OpenVPN Server with Certificate-Based Authentication".*

   ✓ The INSYS router can generate a suitable configuration file for an OpenVPN client after this processes have been completed.

2. Click on the link "Create sample configuration file for remote terminal" to display this configuration file.

```
# This is a sample configuration for an OpenVPN client.
# Select text and copy it into your own configuration file (ends with .ovpn).

# Adjust these parameters
client                  #Client (tls-auth and pull)
remote                  # IP address or domain name of remote terminal
192.168.254.1
ca ca.crt               # File with certificate of Certification Authority (CA)
key private.key         # Private (and secret) key used in combination with certificate
cert certificate.crt    # File with certificate

# Fix parameters
proto udp               # Used protocol for tunnel
rport 1194              # Remote tunnelling port
lport 1194              # Local tunnelling port
comp-lzo                # Activate LZO compression
cipher BF-CBC           # Use cipher
tun-mtu 1500            # Maximum size of packets in byte
reneg-sec 3600          # Interval for renegotiation of data channel key (in seconds)
ping 30                 # Check VPN connection after this amount of seconds
ping-restart 60         # Reestablish VPN connection after this amount of seconds without receiving a ping
                        from the peer
verb 3                  # Amount of log messages
dev tun                 # OpenVPN network device
float                   # Accept packets from all machines (float)

# Route all data through VPN tunnel (remove # to activate it)
#redirect-gateway       # Set VPN tunnel as default route
#route-method exe       # Stable Windows routes
#route-delay 2          # Set routes after delay
```

3. Copy the complete text of this configuration file to the clipboard to able to paste it into a text editor in the next step.

   ✓ You have created a configuration file for the OpenVPN client with this, which must be adjusted to your application now.

Configuration

Adjust the example configuration to your application now. The following steps are necessary for this:

■ Creating the Configuration File from the Example Configuration

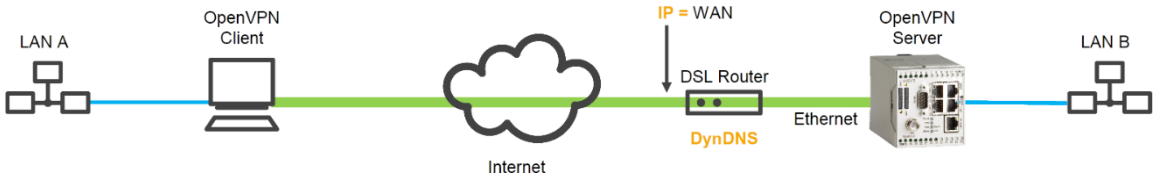
How to create a configuration file for the OpenVPN client from the example configuration of the INSYS router.

→ The OpenVPN package is installed on the computer, which shall act as client.

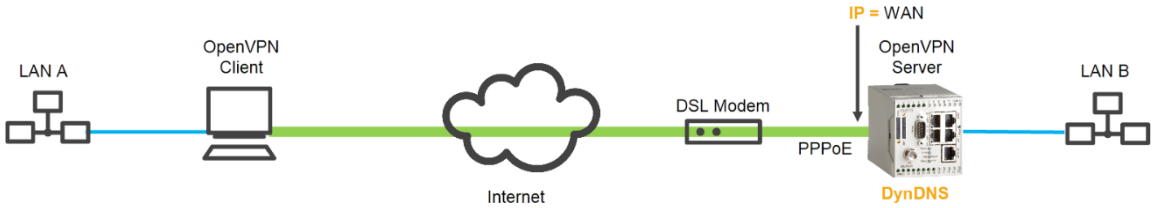
→ You have created the example configuration for the remote terminal using an INSYS router, which is configured as OpenVPN server, and copied it to the clipboard.

→ You must know the IP address accessible via the internet or the domain name of the INSYS router.

ⓘ *This IP address depends on the architecture of the INSYS router network. If the INSYS router is behind a DSL router like in the following figure for example, its WAN IP address must be used. A corresponding port forwarding rule of the tunnel to the INSYS router must be present in the DSL router.*



ⓘ *If the INSYS router is directly connected to a DSL modem without intermediate router like in the following figure, the IP address of the INSYS router must be used.*



ⓘ *If the INSYS router has no fixed IP address, a DynDNS domain name can also be entered, which will then be resolved by the client. For this, DynDNS must be enabled in the DSL router (first example) or in the INSYS router (second example). Information about this can be found in the documentation of the INSYS router. A DNS server must also be entered in the client for this.*

1. Change to the working directory of the OpenVPN package (default: C:\Program Files\OpenVPN\config).
2. Create a new text file there and assign it a file name with the suffix ".ovpn" (e.g. "client.ovpn").

   ⓘ *Make sure that your text editor has not appended the suffix ".txt" to the file. Depending on the Windows configuration, it might also be possible that the display of this suffix is suppressed even if it exists.*

ⓘ *It is also possible that several configuration files are present in the working directory.*

3. Open the file with a text editor.
4. Copy the previously created example configuration into this file.

client.ovpn

```
1  # This is a sample configuration for an OpenVPN client.
2  # Select text and copy it into your own configuration file (ends with .ovpn).
3
4  # Adjust these parameters
5  client                  #Client (tls-auth and pull)
6  remote 192.168.254.1    # IP address or domain name of remote terminal
7  ca ca.crt               # File with certificate of Certification Authority (CA)
8  key private.key         # Private (and secret) key used in combination with certificate
9  cert certificate.crt    # File with certificate
10 # Fix parameters
11 proto udp               # Used protocol for tunnel
12 rport 1194              # Remote tunnelling port
13 lport 1194              # Local tunnelling port
14 comp-lzo                # Activate LZO compression
15 cipher BF-CBC           # Use cipher
16 tun-mtu 1500            # Maximum size of packets in byte
17 reneg-sec 3600          # Interval for renegotiation of data channel key (in seconds)
18 ping 30                 # Check VPN connection after this amount of seconds
19 ping-restart 60         # Reestablish VPN connection after this amount of seconds without receiving a ping from the peer
20 verb 3                  # Amount of log messages
21 dev tun                 # OpenVPN network device
22 float                   # Accept packets from all machines (float)
23
24 # Route all data through VPN tunnel (remove # to activate it)
25 #redirect-gateway       # Set VPN tunnel as default route
26 #route-method exe       # Stable Windows routes
27 #route-delay 2          # Set routes after delay
```

5. Adjust the file names for CA certificate as well as server certificate and key according to the previously created files (here lines 7 to 9).

▶ *If you have received a PKCS#12 file that contains certificates and key (e.g. "Client.p12"), this already contains all files. Delete in this case the lines 7 to 9 and insert a line for this file instead (e.g. "pkcs12 client.p12").*

6. Adjust the IP address or DNS name of the OpenVPN server in the "remote" command (here line 6).
7. Remove the "#" symbol to enable the "route-method exe" command (here line 27).
8. Remove the "#" symbol to enable the "route-delay 2" command (here line 28).
9. Save the modified configuration file.

✓ You have created a configuration file from the example configuration with this and tailored it to your application.

Initial Operation

Start the OpenVPN client now to connect to the server in an OpenVPN network. The following steps are necessary for this:

■ Starting the OpenVPN Client

How to start the OpenVPN client with the computer already in operation. This option via the GUI is suitable for testing the configuration. The option to start the OpenVPN client automatically with the start of the computer is described below.

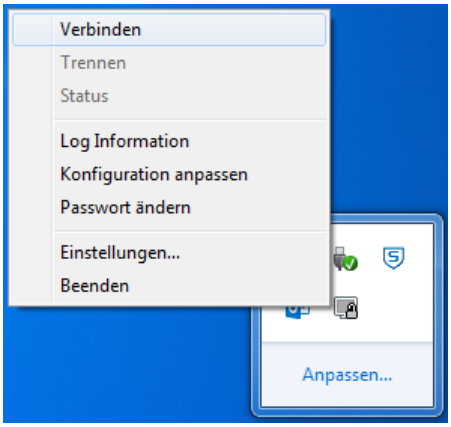
→ The OpenVPN package is installed on the computer, which shall act as client.
→ You have already saved client certificate and key as well as CA certificate in the OpenVPN working directory.
→ You have adjusted the configuration file to your application.
→ The OpenVPN client is started.

1. Start the OpenVPN GUI via Start → Program Files → OpenVPN → OpenVPN GUI or the desktop icon.

   ⓘ *The OpenVPN GUI must be „run as administrator" (via the context menu) explicitly under Windows 7 and Windows Vista . It is not sufficient to be registered as administrator when the OpenVPN GUI is started.*

2. If necessary, click on the symbol for showing the hidden icons in the task bar  .

3. Right-click onto the symbol of the OpenVPN GUI in the task bar  and select Connect (or client → Connect if several configuration files are present (client indicates your configuration file here; in our example client.ovpn)).



   ✓ You have started the OpenVPN client with this. The symbol of the OpenVPN GUI is displayed green as soon as the connection to the OpenVPN server has been established successfully. If the symbol remains yellow, the OpenVPN client tries to reach the server, but the connection cannot be established. A connection log can be displayed using the menu item "View Log".

   ▶ *The respective service can also be enabled for an automatic start of the OpenVPN client with the start of the computer.*

ⓘ *In this case, instances for all configuration files, which are present in the working directory of the OpenVPN package, will be started. Therefore, delete all configuration files, which are not required, from the directory.*

4. Open the Control Center via Start → Settings → Control Center.
5. Double-click in the section "Control Center" the entry "Management".
6. Double-click in the section "Management" the entry "Services".
7. Double-click in the section "Services" the entry "OpenVPNService".
8. Change the "Start type" to "Automatic" and click on "OK".

✓ You have configured the OpenVPN client for an automatic start when starting up the computer.

3 Used Components

Software

Description	Manufacturer	Type	Version
OpenVPN package	Open Source	OpenVPN with GUI	2.3.3
Operating system	Microsoft	Windows	7

Table 1: Used software

4 Further Information

4.1 Literature

OpenVPN
Das Praxisbuch
ISBN: 978-3-8362-1197-0
Publisher: Galileo Computing

OpenVPN
Grundlagen, Konfiguration, Praxis
ISBN: 978-3-89864-396-2
Publisher: dpunkt.verlag

4.2 Web Links

OpenVPN Technologies, Inc.:
http://www.openvpn.net

OpenVPN e.V.:
http://www.openvpn.eu

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