

Configuring an EIGR-V Gigabit IP Router as an OpenVPN Server

For network savvy customers, Contemporary Controls offers a Self-HostedVPN solution which allows users to set up and maintain their own secure, remote access without subscription fees and without the need for a cloud-based VPN server.

Contemporary Controls' EIGR-V Skorpion Gigabit IP router can be configured to operate in OpenVPN server mode which allows the router to act as the VPN server with the ability to support our wired and cellular routers as VPN clients. OpenVPN[®] is a well-supported open-source VPN technology that incorporates SSL/TLS security with encryption. Any IP program (TCP or UDP) can communicate via Self-HostedVPN. Once the VPN connection is established, messages can originate from either side –eliminating the need for port-forwarding.

Setting up an OpenVPN server on your own is not trivial. It typically involves setting up a root certificate authority and generating certificates and keys for the OpenVPN server and for each client device that intends to connect to this server. However, the EIGR-V router has a built-in webpage interface to generate certificates and keys for VPN client devices, without requiring users to download software or having to learn the complexities of setting up a VPN.

For Self-HostedVPN, users are responsible for setting up a fixed public IP address for the EIGR-V operating as the OpenVPN server. The OpenVPN server router can also be connected behind an existing firewall/router with a public IP and use port forwarding to access the OpenVPN server. This OpenVPN server can reside at the client site or any other convenient site and uses the Internet for communicating to OpenVPN clients without any cloud service involved. This specification differs from our RemoteVPN solution, where there is no requirement of a static public IP address because the OpenVPN server is provided by RemoteVPN. Both the Self-HostedVPN and RemoteVPN solutions work for legacy IP devices where it is not possible to configure an IP gateway address on the device.

One EIGR-V in OpenVPN server mode can support up to 15 IP routers in OpenVPN client mode, allowing

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access to 15 remote sites via cellular (EIGR-C) or wired VPN routers (EIGR-V /EIPR-V). Additionally, 15 PC/tablet/ phone OpenVPN clients are supported with access control permissions configurable via the EIGR-V's builtin webpage. These VPN clients can be located anywhere that has Internet connectivity. With this arrangement, PC/tablet/cell phone clients and client routers in remote locations can communicate securely using the services of this one EIGR-V OpenVPN server to devices behind the VPN client routers. An additional benefit is that each PC client can be configured to communicate with one or more router clients independent of each other.

The Self-HostedVPN solution provides secure, remote access to any IP device by just using the VPN IP address for a device. There is no additional requirement to setup Network Address Translation (NAT) or port forwarding on the client routers as they initiate outbound connections to the OpenVPN server.

Furthermore, the OpenVPN client devices only require internet access – there is no requirement for a static or public IP address. Only the EIGR-V router running the OpenVPN server needs to be publicly accessible on a single IP port.





Configure the EIGR-V to act as a OpenVPN Server

1. Setup the Current Time

Select the menu option **Setup -> Time**.

This should be done first as the time will be used when the Certificates are generated.



2. Set the Connection Settings

Select the menu option Advanced -> VPN-> OpenVPN Server -> Config Connection Settings.

Setup the Public IP address/hostname, port, and ping interval/timeout here.

Click Save when done.

Note: The **View OpenVPN Status Log** button can be used to view the connected devices, the public IP addresses associated with the VPN client location, connection time, etc.

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			OpenVPN S	erver	Config Connection Settings
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3. Setup the Certificate Authority (CA) and generate CA key

Select the menu option Advanced -> VPN -> OpenVPN Server -> Config Certificate Authority.

Configure the CA options per your location and click **Save**.

Then, click the **Generate OpenVPN CA** button. This will generate the CA key and the button will be disabled. Note: This is a one-time setup.

The **Reset OpenVPN CA, Certs and Keys** button deletes all the OpenVPN files in case the files need to be generated again.

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Setup Admin	istration Status	Advanced	Save Chang	Jes		
Skorpie Ar	on EIGR GigE Route	Port Range Forwarding Port Forwarding NAT Firewall Allowlist VPN	VPN Client	About This Pag This page is user Certificate Author The first step in u the setup of a ce (CA). The CA is t the creation of ce for the OpenVPN	e d for OpenVPN rity configuration. sing the EIGR-V is trificate authority hen further used in trificates authority server and the Configure the riding to your	
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4. Setup the Device Names

Select the menu option **Advanced -> VPN -> OpenVPN Server -> Config Device Names**.

Set the server name and clients' names for up to 15 routers and 15 PC clients.

Click **Save** at the bottom of the page.

Note: All the names must be unique and contain no spaces.

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5. Create Server Certificates

Select the menu option Advanced -> VPN -> OpenVPN Server -> Create Certificates/Keys.

Click the **Generate Server Certs** button to create the server config. This also involves creating the Diffie-Hellman key and takes up to 15 minutes in the background. Don't reboot or power cycle the router for 15 minutes after clicking this button.

The status of the server certificates is shown below the **Generate Server Certs** button. When the Server Certs are finished, the status message shows Done!

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	1		G	enerate Certs		outoontojo pago.			
	2		G	enerate Certs	Need Support?				
	3	3 Generate Certs Our staff of engineers is available address any issues you may be							

6. Create Client Certificates

Select the menu option Advanced -> VPN -> OpenVPN Server -> Create Certificates/Keys.

This is the same page as **Step 5** above.

If the client device names have been configured, they are shown here, and the corresponding **Generate Certs** button is also enabled. Both the router and PC client certs can be generated with this page.

As more client names are added, the corresponding **Generate Certs** buttons become enabled.

7. Download Client Certificates

Select the menu option Advanced -> VPN -> OpenVPN Server -> Download Certificates/Keys.

After generating the certificates, the client certificates can be downloaded here. The client name and a download link will be available on this page.

Individual router and PC config files in .tgz format can be downloaded from this page.

Router .tgz file can be uploaded to EIGR-V client router directly.

The .tgz file needs to be unzipped to get the .ovpn file for the PC client. Note: these steps are explained in OpenVPN Client Configuration below.

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4				Need Support?	Config PC Client Access
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8. Setup PC Client Access

Select the menu option Advanced -> VPN -> OpenVPN Server -> Config PC Client Access.

Select the access permission for each PC client to the EIGR clients and click the **Save** button at the bottom of the page.

Note: You can click **Select All** to configure 15 routers clients for each PC or click **Default** to return to the default router client for each PC (PC Client 1 = Router Client 1, etc.)

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		Skorpion EIGI	R GigE Route	Port Range Forwarding Port Forwarding NAT Firewall Allowlist VPN	VPN Client	About This Pag Use this page to permissions for the Each individual P connecting to this EIGR-V router co have access to the OnenVPN router co	e setup access he PC clients. C OpenVPN client s OpenVPN server in be configured to he selected clients and their
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9. Setup the Mode and Enable VPN

Select the menu option **Advanced -> VPN**. Set:

- Status to Enable
- Mode to Server
- Internet Access to Enable

Then, click Save.

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Setup	Administra	ation	Status	Advanced	Save Chan	ges	
VPN	Status: Mode: Internet Access:	ElGR mation Firev Contact of the second s	Disable Client	Port Range Forwarding Port Forwarding NAT Firewall Allowlist VPN	VPN Client OpenVPN S	About This pa disable the VPI Status disable Mode a router of allowed Need S Our sta address having, Please informa	This Page age allows you to enable and the VPN along with choosing N mode. allows you to enable or the VPN for this router. allows you to configure this either as an OpenVPN Server N Client. Internet u to enable access le VPN is enabled. fic is restricted to N and no internet access is d. Support? aff of engineers is available to s any issues you may be visit our website for more ation.

10. Save Changes and Reboot

Select the menu option Save Changes.

Please ensure that 15 minutes have passed since you clicked the **Generate Server Certs** button in step 5. Select the menu option **Save Changes** to reboot the router.



OpenVPN Router Client Configuration

1. Select the menu option Advanced -> VPN -> VPN Client.

Upload the router .tgz config file from the EIGR-V using the **Browse/Choose File** (browser dependent) button and then click **Upload**. The configuration settings from the uploaded config file are then shown at the bottom section of the webpage.

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Setup	Adminis	tration	Status	Advanced	Save Chang	jes
	Skorpio _{Aut}	n EIGF omation F	R GigE Route irewall/Router	Port Range Forwarding Port Forwarding NAT Firewall Allowlist		About This Page This page allows you to setup the VPN client. VPN Client Configuration File allows you to upload and download the VPN settings provided by Contemporary Controls or your own config file in the TG2 format. The By a router own
				VPN	OpenVPN S	erver pointing to the keys Ipload to Router c on the browse
VPN Client Col Upload VPN Save Remote	ntiguration f	Select File:	Choose File	No file chosen Upload	Cancel	button to select the VPN configuration file from your computer and then hit save to upload it to the router. The configuration file is originally obtained from your RemoteVPN account or it can be your own TGZ file. Save RemoteVPN Config to PC allows you to save the current VPN configuration for Contemporary Controls RemoteVPN service to your computer. Current VPN Config File Settings section displays the values of the file description, server and IP addresses for VPN and LAN as contained in the VPN file currently in the router. If using your own TGZ file make sure it has a file
Current VPN Config F	ile Settings	Description: VPN Server:	No VPN config fil	e.		named cfg_ip with 4 lines, each line corresponding to the values to be displayed.
		IP Address of side:	n LAN			Need Support? Our staff of engineers is available to address any issues you may be having. Please visit our website for more information.

2. Setup the Mode and Enable VPN

Select menu option **Advanced -> VPN**. Set:

• Status to Enable

- Mode to Client
- Internet Access to Enable

Then, click Save.

Note: The traffic can be restricted to the VPN tunnel only with no internet access, if desired, by setting Internet Access to **Disable**.

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VPN	Skorpio Auto Status: Mode:	n EIGR (omation Firer	GigE Route wall/Router	Port Range Forwarding Port Forwarding NAT Firewall Allowlist VPN	VPN Client OpenVPN	About This Page This page allows you to enable and disable the VPN along with choosing the VPN mode. Status allows you to enable or disable the VPN for this router. Mode allows you to configure this router either as an OpenVPN Server N Client. Internet u to enable access Server It is restricted to the VPN and no internet access is allowed. Need Support?

3. Reboot the router

Select menu option Save Changes. Then, click Save.



Self-HostedVPN PC/Mobile Device OpenVPN Client Configuration

Configuring the VPN clients for PC/mobile devices involves installing the software (if not already installed) and importing the configuration file in **.ovpn** format. The OpenVPN software for PC is available to download from openvpn.net, Google Play Store for Android devices and App Store for iOS devices.

- Unzip the .tgz file.
- Import the .ovpn file to the VPN client.
- For mobile devices (e.g., phone/tablet):
 - Email and save to device.
 - For instructions on how to use an OpenVPN File on Android devices, refer to Using OpenVPN File on Android.
 - For instructions on how to use an OpenVPN File on iOS devices, refer to Using OpenVPN File on iOS.
- For the PC:
 - Windows OpenVPN clients can be downloaded from openvpn.net.
 - Linux clients can be installed using the specific Linux distribution commands.

OpenVPN has versions 2.x and 3.x

- Version 2.x installs as OpenVPN GUI.
- Version 3.x installs as OpenVPN Connect.

OpenVPN Windows PC Client 2.x Download

Go to openvpn.net and select the **Community** \rightarrow **Downloads** menu. Install the VPN client.



1. Install OpenVPN PC config file

Copy the .ovpn client file to the OpenVPN/config folder under Program Files.

с	>	OS (C:)	>	Program Files	>	OpenVPN	>	config
Na	am	e		^				Date mo
OCCSI_HP_TEST_RW05.ovpn								8/30/202
	R	EADME.	txt					2/20/201

Application Note – EIGR-V

2. Start OpenVPN Client

- Type **OpenVPN GUI** in the Windows search bar and select Run as administrator.
- Click the OpenVPN GUI icon in the Windows System Tray on the right side.
- Choose the OpenVPN client file (shows with the Alias Name) and click Connect.
- Use the VPN address to access the remote site.



OpenVPN PC Client 3.x Download

Go to openvpn.net and click the **Get OpenVPN** button.

Announcement OpenVPN La	unches "Operation Inf	formation Freedom"				
OPENVPN'	Self-Hosted VPN	OpenVPN-as-a-Service	VPN Client	Support	Community	Q Log In Get OpenVPN
1. Install OpenVPN	PC config file					

- Scroll down on the webpage to locate the "OpenVPN Connect" download.
- Install OpenVPN Connect.

2. Start OpenVPN Client

- Start OpenVPN Connect.
- Import the .ovpn file and connect.
- Use the VPN address in the dashboard to access the remote site.

Self-HostedVPN Addresses and Considerations

- Router 1 is assigned 10.24.31.x/24 subnet
- Router 2 is assigned 10.24.32.x/24 subnet
- Router 3 is assigned 10.24.33.x/24 subnet
- Router 15 is assigned 10.24.45.x/24 subnet
- One-to-one VPN to LAN address Mapping like RemoteVPN
- No site-to-site access like RemoteVPN
- · Setup current time on VPN Client router
- Setup Gateway address on LAN devices
 - Advanced->Firewall has Masquerade option on EIGR-V client

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