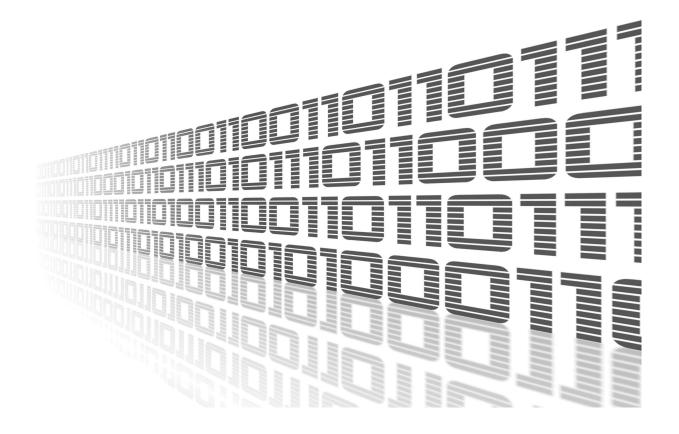# RouterApp

User Module

Stunnel

APPLICATION NOTE

ADVANTECH

Used symbols

Danger – Information regarding user safety or potential damage to the router.

Attention – Problems that may arise in specific situations.

Information or notice – Useful tips or information of special interest.

Example – example of function, command or script.

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1. Description of user module

User module *Stunnel* is not contained in the standard router firmware. Uploading of this user module is described in the Configuration manual (see [1, 2]). The user module is v2 and v3 router platforms compatible.

This module allows the router to create an encrypted network tunnel for which it applies that at one end – either the input or output – data is wrapped in SSL. This means that data on the input is either encrypted, then it is decrypted on the output, or vice versa. Stunnel is primarily designed for adding SSL encryption to communication channels that can not support it. This results in a significant increase of communication security (within these channels). It can be used as additional functionality for commonly used servers, which are running by inetd daemon (Linux daemon which listens to the communication on the network interface and if it is necessary, runs servers for handling requirements). These have included POP2, POP3 or IMAP. Thanks to this module it is also possible to add SSL encryption to NNTP, SMTP and HTTP services which are run by standalone daemons or to PPP tunnels.

The example below shows a change in communication after activation of stunnel.
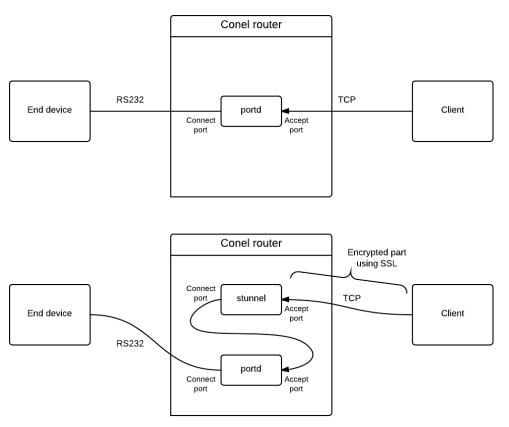
Figure 1: Change in communcation after activation of stunnel

For configuration *Stunnel* is available web interface, which is invoked by pressing the module name on the *User modules* page of the router web interface. The left part of this user module web interface contains the menu, where are only two items – *System Log* and *Return*. The latter (*Return* item) switches this web interface to the interface of the router.
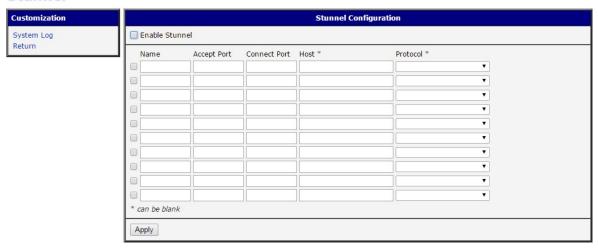

Figure 2: Web interface

2. Configuration

Configuration of *Stunnel* user module is performed via the configuration form in the module web interface. The first item in this form – *Enable Stunnel* – is used to activate these user module. Other items have the following meanings:

Item	Description
☐	Enables/Disables defined stunnel
Name	An arbitrary name of defined stunnel
Accept Port	Port number on which connections are accepted
Connect Port	Number of a remote port where data is sent
Host	Address of a server to which stunnel connects to
Protocol	Specifies application protocol used for transporting. It is possible to choose between *SMTP*, *IMAP*, *POP3*, *CIFS*, *NNTP* or not to define the protocol.

Table 1: Description of items in the configuration form

If the *Host* item is not filled in, stunnel is created in *server* mode. Otherwise it is created in *client* mode.
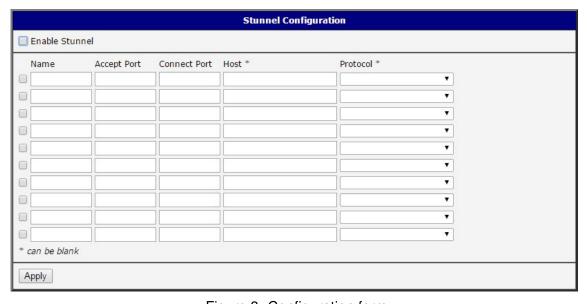

Figure 3: Configuration form

2.1   Model example

Let's assume that you use SMTP internet protocol for transfering e-mail messages and you want to wrap transmitted data to SSL. Stunnel needs to be set as follows:

- Select a *Name* in any form, e.g. MailTunnel.
- *Accept port* has the value 25.
- Set *Connect port* to the value 465.
- *Host* item must be filled in depending on the provider of email service. For example: Write smtp.gmail.com for Gmail.
- Finally, do not forget to check the ☐ box to enable configured stunnel and also check the *Enable Stunnel* item for module activation.

Stunnel Configuration

☐ Enable Stunnel

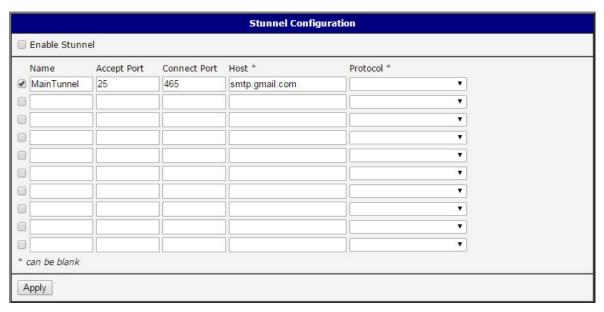|	Name	Accept Port	Connect Port	Host *	Protocol *
☑	MainTunnel	25	465	smtp.gmail.com	▼
☐					▼
☐					▼
☐					▼
☐					▼
☐					▼
☐					▼
☐					▼
☐					▼
☐					▼

* can be blank

Apply

Figure 4: Example of stunnel configuration

It is also necessary to configure the SMTP in the router web interface. In our case, this means the following:

- *SMTP Server Address* box must contain the address of localhost, i.e. 127.0.0.1.
- To *Username* and *Password* boxes fill in your login information.
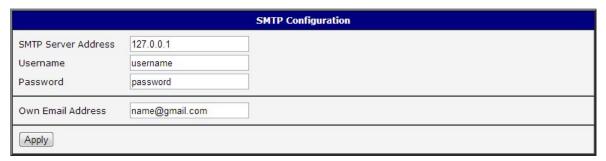- To *Own Email Address* item fill in your email.

5

Figure 5: Example of SMTP configuration

The figure below shows a schematic diagram of the situation corresponding to the described example.
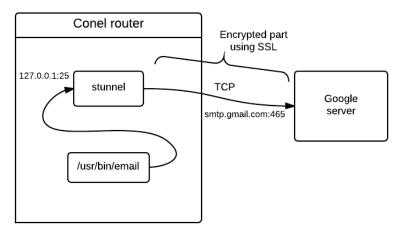

Figure 6: Diagram of an example of stunnel configuration

3. System Log

In case of any problems with connection it is possible to view the system log by pressing the *System Log* menu item. In the window are displayed detailed reports from individual applications running in the router. Activity of *Stunnel* module is indicated in rows starting with word "stunnel". Press *Save Log* button to save the system log to your computer.


```
                              System Log
                            System Messages

2015-03-05 08:27:21 System log daemon started.
2015-03-05 08:27:23 bard[800]: bard started
2015-03-05 08:27:23 bard[800]: selectable backup routes:
2015-03-05 08:27:23 bard[800]: "Primary LAN"
2015-03-05 08:27:23 bard[800]: received signal 1
2015-03-05 08:27:26 bard[800]: backup route selected: "Primary LAN"
2015-03-05 08:27:26 bard[800]: script /etc/scripts/ip-up started
2015-03-05 08:27:27 bard[800]: script /etc/scripts/ip-up finished, status = 0x0
2015-03-05 08:27:27 sshd[1141]: Server listening on 0.0.0.0 port 22.
2015-03-05 08:28:00 crond[1230]: loading crontab file /etc/crontab
2015-03-05 08:28:00 crond[1230]: running /opt/captive_portal/usr/libexec/cron
2015-03-06 08:37:00 last message repeated 1449 times
2015-03-06 08:37:01 stunnel: LOG5[4362:3070164992]: stunnel 4.21 on arm-unknown-linux-gnu with OpenSSL 1.0.1g 7 Apr 2014
2015-03-06 08:37:01 stunnel: LOG5[4362:3070164992]: Threading:PTHREAD SSL:ENGINE Sockets:POLL,IPv6
2015-03-06 08:37:01 stunnel: LOG5[4362:3070164992]: 500 clients allowed

Save Log   Save Report
```

Figure 7: System Log

4. Related Documents

[1] Advantech Czech: **v2 Routers Configuration Manual** (MAN-0021-EN)
[2] Advantech Czech: **SmartFlex Configuration Manual** (MAN-0023-EN)
[3] Advantech Czech: **SmartMotion Configuration Manual** (MAN-0024-EN)
[4] Advantech Czech: **SmartStart Configuration Manual** (MAN-0022-EN)
[5] Advantech Czech: **ICR-3200 Configuration Manual** (MAN-0042-EN)

Product related documents can be obtained on *Engineering Portal* at www.ep.advantech-bb.cz address.