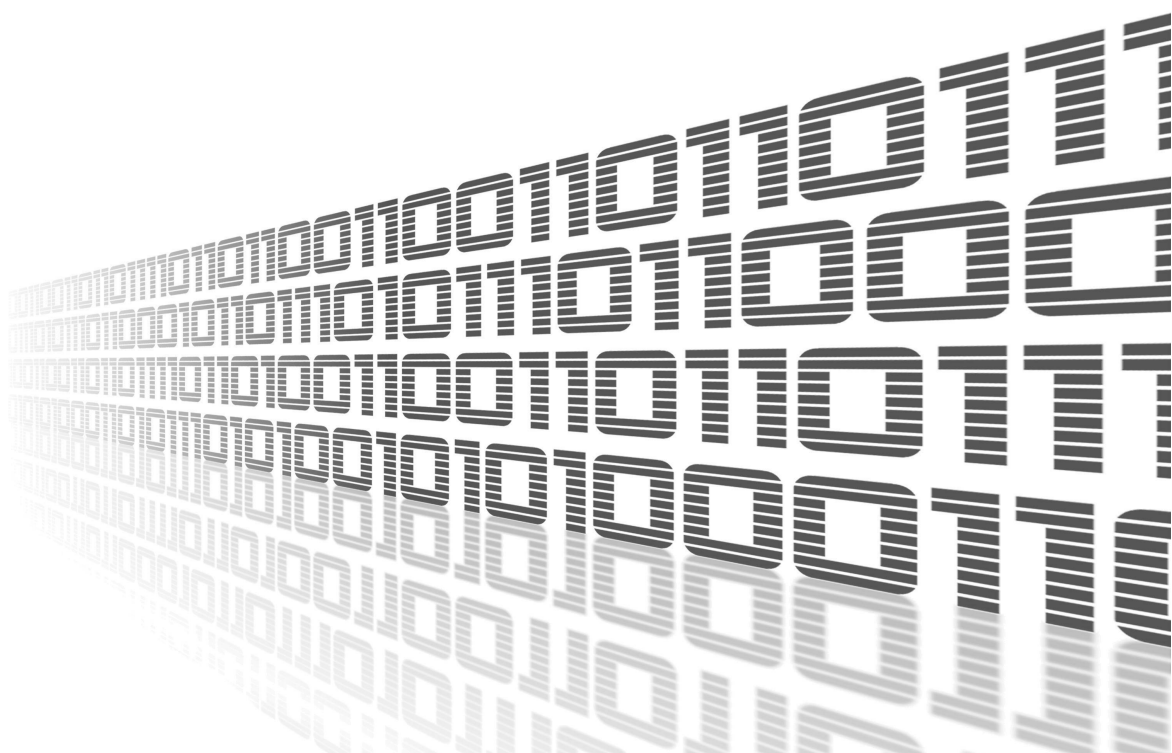




User Module

Secure Syslog

APPLICATION NOTE



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. Introduction



This user module is not installed on *Advantech* routers by default. See *Configuration Manual* for the description how to upload a user module to the router. For more information see the *Configuration manual*, chapter *Customization* → *User Modules*.



The user module is v2, v3 and v4 router platforms compatible.

As described in the Remote Monitoring Guide [6], the System Logging (syslog) protocol is used to send router event information to a specific server, such as Graglog¹ or PRTG Network Monitor². The default syslog service provided by router firmware supports the UDP transport protocol only, which may be used in secure private networks only.

This module implements an enhanced syslog client (sender) that can forward syslog messages to a server (receiver) over a secure TLS protocol as defined in RFC 5425. Such well authenticated and encrypted communication may be transmitted over a public internet. The insecure, plain UDP and TCP transport protocols are supported too, but not recommended.

¹<https://www.graylog.org>

²<https://www.paessler.com/prtg>

2. Web Interface

Once the installation of the module is complete, the module's GUI can be invoked by clicking the module name on the User modules page of router's web interface.

Left part of this GUI contains menu with Configuration menu section and Information menu section. Customization menu section contains only the Return item, which switches back from the module's web page to the router's web configuration pages. The main menu of module's GUI is shown on Figure 2.

Configuration
Global
Information
Status
Licenses
Customization
Return

Figure 1: Menu

2.1 Configuration

2.1.1 Global

All Secure Syslog user module settings can be configured by clicking on the *Global* item in the main menu of module web interface. An overview of configurable items is given below.

Secure Syslog Configuration	
<input checked="" type="checkbox"/> Enable	
<input checked="" type="checkbox"/> Read Kernel Log	
<input checked="" type="checkbox"/> Listen for UDP	
Local Port	<input type="text" value="514"/>
Remote IP Address	<input type="text" value="192.168.88.79"/>
Remote Port	<input type="text" value="1514"/>
Protocol	<input type="text" value="SSL/TLS"/>
Authentication	<input type="text" value="Certified peer name"/>
Acceptable Peers	<input type="text" value="server.conel.cz"/>
CA Certificates	<pre>-----BEGIN CERTIFICATE----- MIIIFSTCCAzGgAwIBAgIUURSTXXU4hyWq0pWp8S+YKXxHGcD4wDQYJKoZIhvcNAQEL BQAwUzELMAkGA1UEBhMCREUxETAPBgNVBAoMCE9wZW51YUetJMqwwCgYDVQQQLDANQ</pre>
Local Certificate *	<pre>-----BEGIN CERTIFICATE----- MIIGdzCCBF+gAwIBAgIKD/+CIQqmi67M8DANBgkqhkiG9w0BAQsFADBTMQswCQYD VQQGEwJERTERMA8GA1UECgwIT3BlblhQS0kxDDAKBgNVBAsMA1BLSTEjMCEGA1UE</pre>
Local Private Key *	<pre>-----BEGIN PRIVATE KEY----- MIIEvwIBADANBgkqhkiG9w0BAQEFAASCBAkwggSIAgEAAoIBAQDiuKxzIORIXySF K36HOMUtynIZPJW84dFULxe0dFY178AQkL0cK63cJ7Y5yNRQFEHfIRcNY68dC4zo</pre>
* can be blank	
<input type="button" value="Apply"/>	

Figure 2: Configuration

Item	Description
Enable	Enables Secure Syslog functionality.
Read Kernel Log	Retrieve new log messages from the /dev/kmsg. Check this if you want to forward also kernel messages, such as information about device mounting or messages from the fire-wall LOG target. After service (re)start all existing kernel log entries be sent to the remote server, so the server may receive duplicate messages. Then, the system will await new messages.

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Item	Description
Listen for UDP	Listen for syslog messages incoming via the UDP protocol. The messages can be sent by the local syslog service (see Section 2) and/or by any remote system. After service (re)start the system immediately starts listening for new messages. Prior syslog communication will not be distributed.
Local Port	UDP port where to listen for the incoming syslog messages. The common port number is 514.
Remote IP Address	Forward any message to this IP address.
Remote Port	Forward to this port, e.g. 514.
Protocol	Forward using this protocol. Allowed values are: <ul style="list-style-type: none"> • UDP • TCP • SSL/TLS
Authentication	<p>How to authenticate the syslog server, when using the SSL/TLS protocol. Allowed values are:</p> <ul style="list-style-type: none"> • None (encryption only) to skip transport receiver authentication. The communication will still be encrypted. • Certificate fingerprint to check fingerprint of the received certificate against the Acceptable Peers. • Certificate validity to accept any server with a valid certificate, signed by the specified CA. • Certified peer name to check certificate validity and then match the certified DNS names in the subjectAltName extension, or the entire certified Common Name against the Acceptable Peers. <p>Note the server may (depending on its configuration) implement own transport sender authentication, which is independent of this setting.</p>

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Item	Description
Acceptable Peers	Accepted certificate fingerprint (SHA1) or DNS/Common Name of the remote peer. The DNS name may use wild-cards, e.g. „*.example.net“. Required when Authentication is set to Certificate fingerprint or Certified peer name.
CA Certificates	The entire certificate chain (sequence of CA certificates in PEM format) that can validate the remote certificates. Not required when Authentication is set to None.
Local Certificate	Certificate in PEM format. Extended key usage shall permit use for TLS client authentication!
Local Private Key	The local key and certificate don't need to be configured when the server does not enforce transport sender authentication.

Table 1: Configuration items description

2.2 Integration with local syslog service

To receive syslog messages from the local syslog service, set *Remote IP Address* in the Syslog service configuration to 127.0.0.1, which will forward the syslog traffic to the Secure Syslog module. The *Remote UDP Port* shall match the *Local Port* discussed above.

Syslog Configuration	
Log Size	<input type="text" value="1000"/> lines
Remote IP Address	<input type="text" value="127.0.0.1"/>
Remote UDP Port	<input type="text" value="514"/>
<input type="button" value="Apply"/>	

Figure 3: Syslog configuration

2.3 Integration with Graylog server

First, install the Graylog server, either download the Open Source Edition¹ or purchase the Enterprise Edition. You may, for example, download the OVA image and then import the appliance to your virtual environment.

Run the imported appliance. Once first started, the console will display a Web login and Shell login information (username:password). Write down these information as they will not be displayed again.

```
Open http://192.168.88.79 in your browser to access Graylog.
Write down the following passwords, they appear only once after the first boot.
Web login: admin:pmttJK3z
Shell login: ubuntu:ubuntu
graylog login:
```

Figure 4: Graylog message

Use these information to login to the Graylog admin. In the menu select System – Inputs, then Select input „Syslog TCP“ and click Launch new input. A configuration dialog will appear:

- Give the input some name.
- Set a Port number, e.g. 1514 (in the default configuration the number must be > 1024).
- Enable TLS.
- Optionally, set a full path to a *TLS cert file* and *private key file*. Place the .crt and .key file on the Graylog server in `/etc/graylog/server/ssh`.
- Optionally, set *TLS client authentication* to “optional” or “required”. When set, you have to define also a full path to a directory with *TLS Client Auth Trusted Certs*. Place your CA certificates(s) to the defined directory, e.g. `/etc/graylog/server/ssh/cacerts`.

Once the input is created, it shall display as RUNNING and the received data shall start appearing under Streams – All Messages.



Verify in the *Time configuration* under *System – Overview* that the current time (clock) of your routers match the clock of the Graylog server. Messages may get lost if the clock don't match.

¹<https://www.graylog.org/products/open-source>

3. Troubleshooting

Generic tlsv1 alert internal errors (see below) reported in router System Log can be caused by server-initiated session termination. Set the server log level to Debug and inspect the server-side log for more details. Often the Local Certificate is missing or is not permitted to perform the TLS client authentication.

```
rsyslogd: SSL\_ERROR\_SSL Error in 'sslHandshakeCheck Client': 'error:00000001:lib  
(0):func(0):reason(1)(1)' with ret=0 [v8.2010.0]  
rsyslogd: OpenSSL Error Stack: error:14094438:SSL routines:ssl3\_read\_bytes:tlsv1  
alert internal error [v8.2010.0]
```

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)
- [6] Advantech Czech: **Remote Monitoring Guide** (APP-0091-EN)



Product related documents can be obtained on *Engineering Portal* at <https://ep.advantech-bb.cz/> address.