



# Quantis Appliance User Manual

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# 1 Introduction

The Quantis Appliance is a network-attached device, which securely generates and delivers high-quality random numbers for security and cryptographic applications in enterprise, government, gaming, and cloud environments. The Quantis Appliance is designed for environments where high availability is necessary. It can be inserted in or removed from an operating network with no impact on any other appliance, such as servers, switches, and Hardware Security Modules (HSMs).

The random numbers generated by the Quantis Appliance are used for different applications: to generate high-quality cryptographic keys for encryption or authentication, to seed deterministic PRNGs or to provide entropy for online gaming and mathematical simulations.



This manual is intended for the system administrator, network manager, security manager or technician who will install, configure, and operate the Quantis Appliance.

The following sections provide detailed descriptions of installation, operation, procedures and reference material.

## 2 System Overview

The Quantis Appliance serves as a hardware source of trust for cloud or distributed environments, on any operating systems via the REST API. It provides secure keys for Virtual Machines (VMs), Virtual Private Networks (VPNs), HSMs, and remote desktops. It is also used in Randomness-as-a-Service (RaaS) or Security-as-a-Service (SaaS) environments.

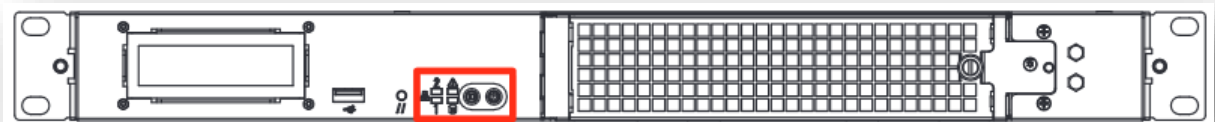
Key features :










- Quantum source of full entropy, intrinsically random
- True randomness from the first bit
- Provably unpredictable entropy source
- Multi-threading up to 10'000 requests/s
- Live status verification & Health check output
- Seamless integration in any network or security solution
- Standard REST interface over HTTPs
- FIPS-compliant appliance designed for high availability
- Hot pluggable and swappable into operating networks

## 2.1 Front panel

The front panel provides 2 system buttons (Power & Reset) and 3 LED indicators (System power, System hard drive disk activity, Service ID).



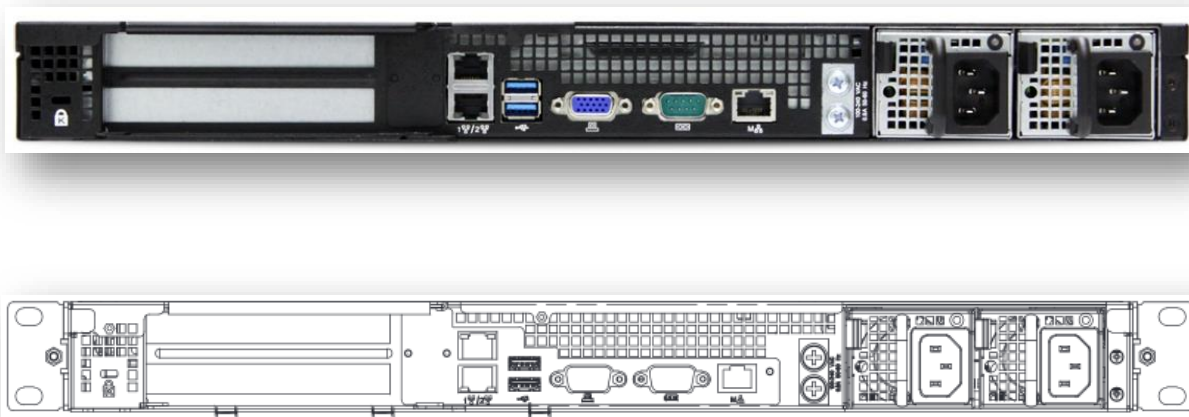
	<b>Power On/Off</b>
	<b>System Power LED</b>
	<b>LAN 1 LED</b>
	<b>LAN 2 LED</b>
	<b>System HDD Activity LED</b>
	<b>Service ID LED On/Off</b>
	<b>System Reset</b>

## 2.2 Rear panel

The rear panel provides:

- 3 LAN ports
  - LAN 1
  - LAN 2
  - LAN M
- 2 USB 3.0 double stack Type A
- 1 VGA port and 1 DB-9 COM-port.

For Quantis Appliance, please use only the LAN 1 and 2 ports, and the COM port.



## 2.3 Configuration Interface

The configuration of the system is done through a Command Line Interface (CLI). It uses the serial COM port of the appliance. Use the provided USB to Serial COM port and connect to your computer.

## 2.4 Random numbers interface

The random numbers are available on the LAN1 interface. For this connect the provided Ethernet cable to your LAN.

## 3 Safety and Maintenance

### 3.1 Transport and storage

Maintain a temperature range within specifications when transporting or storing the unit.

Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- pack the unit in the original packing material when shipping
- store unit at room temperature in a clean and dry area
- avoid high humidity or large temperature fluctuations
- keep the unit out of direct sunlight
- avoid unnecessary shock and vibration

### 3.2 Safety precautions

The following safety precautions must be observed during the operation and servicing of the unit. Failure to comply with these precautions or with specific indications elsewhere in this manual violates safety standards of intended use of the unit. IDQ assumes no liability for the user's failure to comply with these requirements.

- This unit is intended for indoor use only.
- Unit covers cannot be removed during operation
- Before powering on the unit, all grounding terminals, extension cords, and devices connected to it should be connected to a protective ground via a ground socket. Any interruption of the protective grounding is a potential shock hazard and may cause personal injury.
- Whenever the ground protection is impaired, the unit is not to be used and must be secured against any accidental or unintended operation.
- Any adjustments, maintenance, and repair should be handled and carried out only by IDQuantique personnel while power cable is disconnected. Do not attempt internal service or adjustment. Do not replace any components.
- Operation of any electrical instrument around flammable gases or fumes constitutes a major safety hazard.
- Installation of replacement parts or modification of the unit should be carried out by IDQuantique personnel only.
- Certain components inside the unit – e.g. capacitors – may be charged even if the unit has been disconnected from its electrical supply.
- What is not explicitly allowed in this manual is forbidden.

### **Warning**

To avoid electrical shock, do not operate the unit if there are signs of damage to any part of the appliance outer surface (covers, panels, etc.).

To avoid serious injury, the following precautions must be observed before powering on the unit.

- If the unit is to be powered via an auto-transformer for voltage reduction, the common terminal must be connected to the grounded power source pole.
- Insert the plug into a power outlet with a protective ground contact. Do not use an extension cord without a protective conductor.
- Before powering on the unit, the protective ground terminal of the unit must be connected to a protective conductor using the unit power cord.
- Do not tamper with the protective ground terminal.

## 3.3 General Maintenance

There are no user-serviceable components in the Quantis appliance, notwithstanding the procedure described in this section. The Quantis appliance has been designed to require minimum maintenance and to provide reliable performance.

To help ensure long, trouble-free operation:

- keep the Quantis Appliance free of dust
- do not spill liquids on or into the unit. If the unit does get wet, turn off the power immediately and let the unit dry completely.
- clean the Quantis appliance casing with a slightly damp (with water) cloth.

## 4 Warranty

IDQ warrants this equipment against defect in material and workmanship for a period of twelve months from the date of original shipment. The warranty and technical support can be extended due to the request. For more info please contact [sales@idquantique.com](mailto:sales@idquantique.com). IDQ also warrants that this equipment will meet applicable specifications under normal use. During the warranty period, IDQ will, at its discretion, repair, replace, or issue credit for any defective product.

### Important

The warranty can become void if:

- the equipment has been tampered with, repaired, or worked upon by unauthorized individuals or non-IDQ personnel
- the warranty sticker has been removed
- the case has been opened
- the equipment serial number has been altered, erased, or removed
- the equipment has been misused, neglected or damaged by accident

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL IDQ BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

### Note

For more information, please contact [info@idquantique.com](mailto:info@idquantique.com).

### 4.1 Liability

IDQ shall not be liable for damages resulting from the use of the purchased product, nor shall be responsible for any failure in the performance of other items to which the purchased product is connected or the operation of any system of which the purchased product may be a part.

### 4.2 Exclusions

IDQ reserves the right to make changes in the design or construction of any of its products at any time without incurring any obligation to make changes whatsoever on units purchased.

### 4.3 Certification


IDQ certifies that this equipment met its published specifications at the time of shipment from the factory.

## 5 Getting Started

### 5.1 Installation

#### 5.1.1 Physical Installation

In order to install the Quantis Appliance, please perform the following steps:

- 1) Plug the power cable in the Power supply socket.
- 2) Plug the Ethernet cable in the Ethernet slot LAN1.
- 3) Connect the USB to Serial converter in the COM port for configuration.
- 4) Turn on the QA using the  button in the front panel.

The appliance takes around 1 minute to boot.

#### 5.1.2 Computer configuration

On your computer connect the USB to Serial cable to an available USB port.

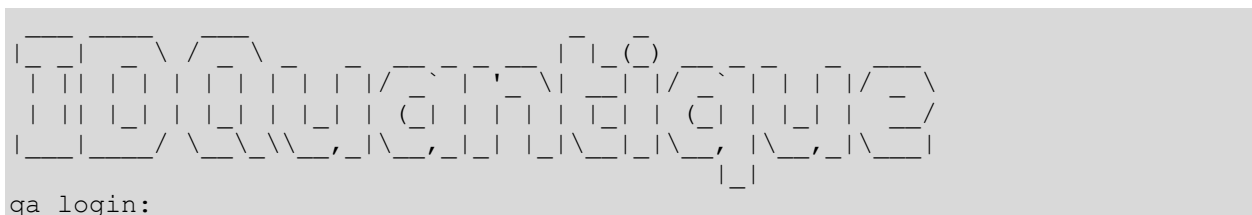
Use a Serial terminal software for instance:

- On Linux: Putty, Minicom, MobaXterm
- On Windows: Putty, Teraterm, MobaXterm

Then configure the serial port with the next settings:

- Serial port baud rate: 115200
- no parity, 8 data-bits, one stop-bit

Open the connection and press RETURN and the login should be printed:



### 5.1.3 CLI configuration

Then log in with the factory default credentials:

Username: **cliUser**

Password: **cliUser**

```
qa login: cliUser
Password:
Last login: Fri Jul 21 16:48:18 on tty1
=====
*                                     *
*      ~~ Quantis Appliance CLI ~~   *
*                                     *
=====

Welcome to Quantis Appliance CLI
qa-cli>
```

If the login success the CLI print the next command invit: **qa-cli>**

The CLI is easy to use because it contains almost all the standards functions of a command line:

- Auto-completion of commands and arguments by typing: **Tab**
- History of the commands by typing: **↑**
- A specific help for each command with examples by typing: **help**

Then Type **help** to show the list of the available commands:

```
qa-cli>help
Usage: help <command>

where <command> is one of:
  cert-export (Exports the QA certificate on an USB stick)
  cert-import (Imports a certificate signed by an external CA)
  cert-new (Create a new certificate)
```

```
cert-show (Shows the actual certificate)
clear (Clears the console)
date (Displays or sets the local date and time)
debug false (Disable debug mode)
debug true (Enable debug mode)
exit (Exits the shell)
firmware-info (Shows information on the appliance)
firmware-update update (Apply an update)
help (List all commands usage)
hostname (Get or set the hostname)
keep-alive (Configure Hot Standby)
list-usb (Lists the usb key contents)
monitor-log (Monitor the log output)
nic (Specify an ipv4 address)
ping (Ping an IP address)
pwd (Allows the user to change the CLI Password)
reboot (Reboot the system)
shutdown (Shutdown the system)
system-info (Shows information on the appliance)
```

To get a command specific help type: **help** command

For instance, for the ping command type:

```
qa-cli>help ping
COMMAND
ping <options...> - Ping an IP address

OPTIONS
--addr <IPV4> (Mandatory) - Specify the IP address to ping
--count <INT> (Default: 1) - Specify the number of requests

EXAMPLES
ping --addr 127.0.0.1
ping --addr 192.164.2.3 --count 10
```

## 5.2 Quick start

### 5.2.1 Change default password

For security reasons, it's recommended to change the default password:



Type **pwd** to change the password

```
qa-cli>pwd
```

```
Enter the new password: *****
```

```
Enter the new password once again: *****
```

```
Password correctly set
```

### 5.2.2 Setup date

Make sure the date is up to date:

Type **date** to get the current date and time.

```
qa-cli>date
```

```
Tuesday, July 25, 2017 12:40:31 PM CEST
```

If required, it is possible to change the date and time using this command:

```
qa-cli>date --set '2017-07-26 16:13:00'
```

```
Wed Jul 26 16:13:00 CEST 2017
```

### 5.2.3 Setup Network interface

The factory default configuration is:

- Network interface LAN1
  - IPv4: 10.17.17.1
  - Netmask: 255.255.255.0
  - Gateway: 0.0.0.0
  
- Network interface LAN2
  - IPv4: 10.17.17.101
  - Netmask: 255.255.255.0
  - Gateway: 0.0.0.0

This configuration should be changed to match the production LAN, in particularly new IP addresses should be specified and separate subnets for each ethernet port should be used, if more than one ethernet port is used in the deployment.

To change the network configuration type:

```
qa-cli>nic --id 1 --addr 10.17.17.10/8 --gateway 10.0.0.1
Address changed
Gateway changed
*****
GENERAL.DEVICE:                eno1
GENERAL.TYPE:                  ethernet
GENERAL.HWADDR:                0C:C4:7A:95:88:AC
GENERAL.MTU:                   1500
GENERAL.STATE:                 100 (connected)
GENERAL.CONNECTION:            System eno1
GENERAL.CON-PATH:              /org/freedesktop/NetworkManager/ActiveConnection/10
WIRED-PROPERTIES.CARRIER:     on
IP4.ADDRESS[1]:                10.17.17.10/8
IP4.GATEWAY:                   10.0.0.1
IP4.DNS[1]:                    10.0.0.1
IP6.ADDRESS[1]:                fe80::ec4:7aff:fe95:88ac/64
IP6.GATEWAY:

*****

GENERAL.DEVICE:                eno2
GENERAL.TYPE:                  ethernet
GENERAL.HWADDR:                0C:C4:7A:95:88:AD
GENERAL.MTU:                   1500
GENERAL.STATE:                 100 (connected)
GENERAL.CONNECTION:            System eno2
GENERAL.CON-PATH:              /org/freedesktop/NetworkManager/ActiveConnection/11
WIRED-PROPERTIES.CARRIER:     off
IP4.ADDRESS[1]:                10.17.17.101/8
IP4.GATEWAY:                   10.0.0.1
IP4.DNS[1]:                    10.0.0.1
IP6.ADDRESS[1]:                fe80::ec4:7aff:fe95:88ad/64
IP6.GATEWAY:
```

\*\*\*\*\*

**Warning:** although the IP addresses have been setup on the same subnet in this example, this should not be done on a production LAN. The Quantis Appliance has two ethernet ports, if both are to be used, then the first ethernet port should be on a different subnet from the second ethernet port. It is important to do this because this gives the user assurance of the route that traffic takes through the network hardware, which otherwise could be inconsistent.

### 5.2.4 Setup hostname

The factory default hostname is **qa2-proto1.localdomain**

To change the hostname, type:

```
qa-cli>hostname --name myhostname
Hostname correctly changed to 'myhostname'
```

### 5.2.5 Regenerate a new SSL certificate

An SSL Certificate must be generated if the date or the hostname is modified. In order to regenerate a new certificate, the following command is used.

```
qa-cli>cert-new --self-signed yes
Name: (10.17.17.11) [return]
Country: (CH) [return]
State: (Geneva) [return]
City: (Geneva City) [return]
Organization: (ID Quantique) [return]
Organization Unit: (RNG) [return]
eMail Address: (info@idquantique.com) [return]
Validity days: (365) [return]
Could you please confirm:
Name: 10.17.17.11
Country: CH
State: Geneva
City: Geneva City
Organization: Id Quantique
Organization Unit: RNG
Email: info@idquantique.com
Validity days: 365
Self-Signed: yes
Do you agree? (yes or no) yes
Generating a 2048 bit RSA private key
```

```
-----  
Signature ok
```

## 5.2.6 Check the generated certificate

Optionally you can verify the content of the certificate. For this use the cert-show command.

```
qa-cli>cert-show  
Certificate:  
  Data:  
    Version: 1 (0x0)  
    Serial Number: 13755274384353211908 (0xbec48d2c8b673604)  
    Signature Algorithm: sha1WithRSAEncryption  
    Issuer: C=CH, L=Geneva City, ST=Geneva, O=Id Quantique, OU=RNG,  
CN=10.17.17.11/emailAddress=info@idquantique.com  
    Validity  
      Not Before: Jul 26 14:17:45 2017 GMT  
      Not After : Jul 26 14:17:45 2018 GMT  
    Subject: C=CH, L=Geneva City, ST=Geneva, O=Id Quantique, OU=RNG,  
CN=10.17.17.11/emailAddress=info@idquantique.com  
    Subject Public Key Info:  
      Public Key Algorithm: rsaEncryption  
      Public-Key: (2048 bit)  
      Modulus:  
        00:c7:35:a2:da:37:7d:f9:a2:b8:e9:09:15:fe:d5:  
        87:a7:d5:79:13:17:10:2b:7a:9f:48:1a:18:22:59:  
        10:2f:bd:7e:35:ff:a4:8e:bc:37:70:75:8f:b4:02:  
        4e:a0:fd:9b:1b:19:99:98:70:33:e0:8e:4e:73:d6:  
        bb:a4:cd:0c:ef:27:31:30:b1:82:44:39:bf:64:38:  
        5e:7b:ce:fe:94:f2:50:34:97:46:68:5e:be:f1:57:  
        5c:7d:57:e1:d7:b2:bc:0d:ed:b6:6f:05:67:77:51:  
        65:5f:95:d8:9c:b7:29:cf:88:63:19:a5:5d:b9:2e:  
        cf:a8:d7:f5:b6:16:78:90:b1:2f:62:a8:1f:f8:58:
```

```
41:ca:54:6d:8b:9d:9e:3a:b0:23:81:a7:20:1b:9a:
7b:50:10:66:5c:15:fe:af:1a:0d:bc:6f:ea:eb:8f:
47:e4:87:dd:6c:d6:27:f8:b9:4e:35:82:48:00:94:
7d:39:9b:a9:5d:90:a3:d8:fe:76:4a:b3:2c:af:b5:
75:1f:3d:47:aa:6f:f4:33:f3:14:97:85:84:cd:4f:
84:f4:33:22:e8:60:14:ed:51:80:1d:89:7a:15:80:
06:c3:5b:1a:b9:d0:67:7a:40:be:32:8f:a3:0f:a0:
6c:5c:6e:c2:c1:9a:59:65:98:ba:2c:b1:38:57:ec:
10:d5
```

Exponent: 65537 (0x10001)

Signature Algorithm: sha1WithRSAEncryption

```
03:32:4d:dc:bd:6f:ff:af:4d:d6:83:d4:c7:d7:58:2d:b9:99:
3b:f0:67:97:10:2d:3d:0b:1c:35:bf:98:12:fe:f6:80:19:22:
ea:b4:66:8e:1e:4e:74:ea:81:a4:d0:d9:97:c1:b4:7a:9a:3f:
e1:6a:9f:95:ed:a8:7b:cd:40:42:9e:b4:71:ed:f0:a6:3f:06:
4a:a4:40:8f:be:b7:4a:e5:63:f8:4b:01:99:19:15:47:bd:6d:
2c:d7:76:bf:68:fc:4c:d2:c6:48:fe:d2:c3:e7:af:99:7c:f0:
34:32:ea:ee:69:a9:00:47:c7:a0:86:6f:25:2c:a5:23:62:5b:
33:c6:8a:b6:4f:91:db:4a:4c:a0:cd:bc:a9:23:d9:d3:ec:5b:
03:09:17:f9:36:a6:7f:fb:ad:8a:5f:0a:a5:a6:da:c1:18:b8:
12:23:0b:aa:e1:76:12:35:64:dc:03:30:98:76:56:81:64:f9:
55:7f:c0:0c:87:ce:fc:54:12:58:89:2e:51:e0:36:5b:cb:46:
5c:a7:cd:0f:93:e7:55:9b:c7:60:7b:d3:66:60:29:96:b1:f5:
c7:cd:6c:32:85:15:cd:ec:23:9b:82:40:63:10:2c:98:2d:d9:
5c:1f:cd:19:90:c7:5b:0c:ff:1f:45:29:1d:72:0f:db:cf:8f:
b6:92:fa:68
```

After this quick configuration, the appliance is ready for operations.

## 5.3 Retrieving Random numbers

To operate the system the appliance must be up and connected to the LAN1 or LAN2 port.

Random bytes can be retrieved from the Quantis Appliance using HTTPS protocol.

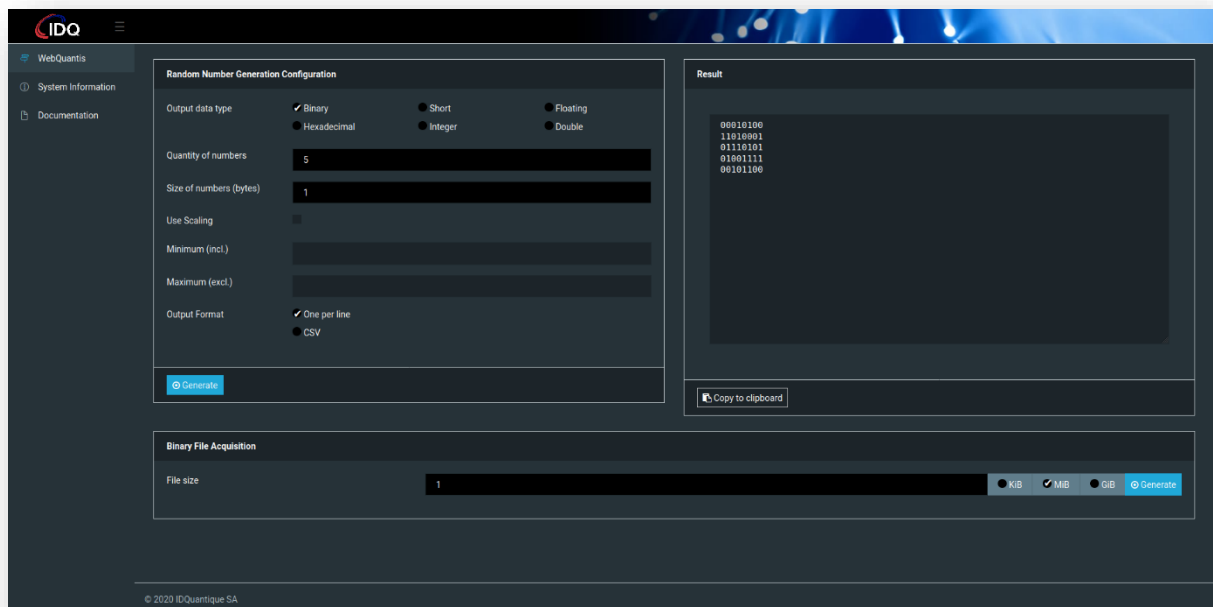
Port 80 of the HTTP protocol can be used but it is redirected to the HTTPS port (443).

There are 3 main ways to get query the Quantis appliance, either by:

- Using the built-in webserver
- Using REST API with JSON query in a web browser
- Using REST API with JSON query in Linux curl command

### 5.3.1 Built-in Webserver

Using a web browser (Firefox or Chrome supported) type the IP address of the appliance as defined in the configuration.



The Web Quantis application allows to generate:

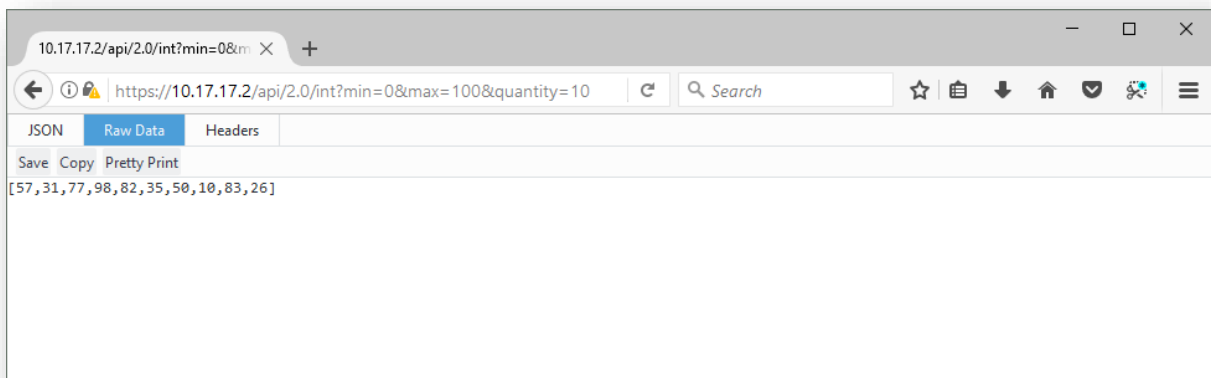
- random bytes displayed as binary or hexadecimal numbers

- random numbers in different data types with optional scaling (between min inclusive, and max exclusive):
  - Short
  - Integer
  - Float (without scaling, the outputted numbers are between 0 and 1)
  - Double (without scaling, the outputted numbers are between 0 and 1)
- a binary random number file, ready to download.

### 5.3.2 JSON query using web browser

A web browser can be used to retrieve random numbers from the server through JSON HTTPS query.

The server exposes a REST API described in details in the [swagger UI file](#).



Example of command for HTTPS protocols can be found below:

<https://IpAddress/api/2.0/int?min=1&max=50&quantity=10>

### 5.3.3 JSON query using Linux curl

In a Linux terminal, random numbers can be retrieved through a curl command.

```
$ curl -k 'https://IpAddress/api/2.0/int?min=1&max=50&quantity=10'
```

[2, 37, 4, 17, 30, 17, 23, 34, 43, 8]



### 5.3.4 Retrieving numbers

Random numbers can be retrieved in different formats:

- **Binary:** Raw binary data, typical application is security.

```
$ curl -k 'https://IpAddress/api/2.0/streambytes?size=256' > rand.bin
```

- **Numeric:** numbers can be cast in several data types: Short, Integer, Double or Float. Optionally numbers can be reduced in a range. This so-called “Scaling feature” target the gaming application. It means the random number can be in the interval min (inclusive) and a max value (exclusive).

```
$ curl -k 'https://IpAddress/api/2.0/double?min=0&max=1&quantity=3'  
[0.5381045206003764,0.05909736119066311,0.18390003030724533]
```

### 5.3.5 System Information

The system information page retrieves information for management such as:

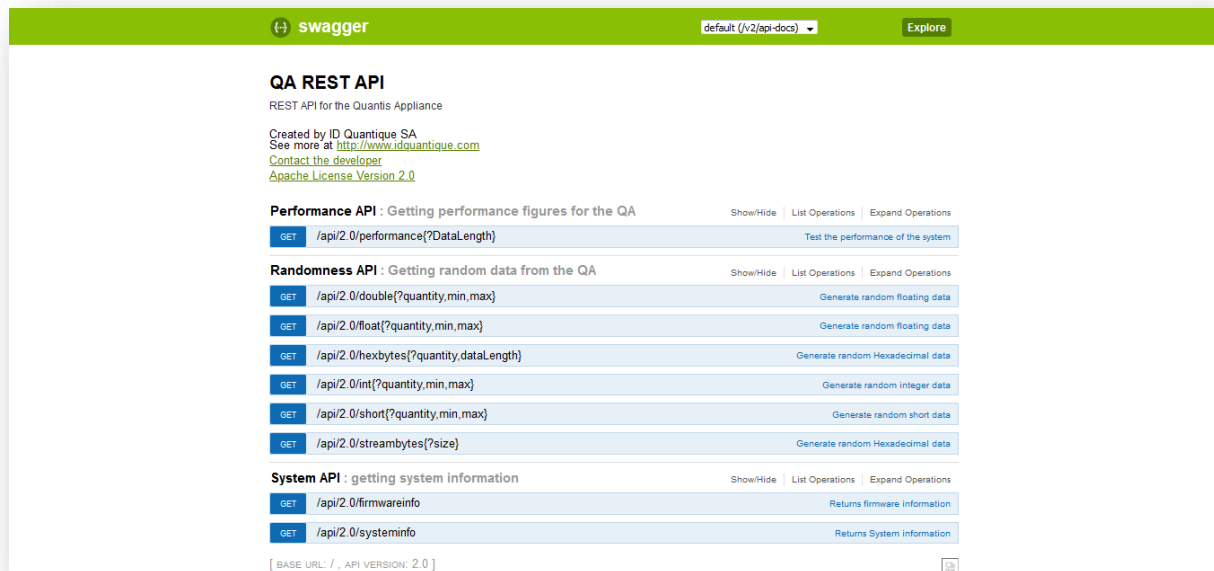
- **General information** that identifies the hardware
- **Firmware information** that identifies the running software
- **Performance** that tests the effective throughput

## 5.4 Documentation

### 5.4.1 User manual

A PDF version of the present document is available on the web page and updated at each new product release.

## 5.4.2 Swagger UI



A description of all the available REST commands is detailed on this page, including each argument of each command. It is also available directly from:

<https://IpAddress/swagger/swagger-ui.html>

## 5.4.3 Swagger file

All the available queries are described in a standard swagger file available here:

<https://IpAddress/swagger/json>

## 6 SSL Certificates and security exceptions

### 6.1 SSL Certificates

HTTPS secure connection relies on an SSL certificate. The Quantis appliance is able to handle 2 kinds of certificates:

- **Self-signed certificate** recommended for users without security expertise
- **Signed certificate by an external Certificate Authority** recommended for users with security expertise

#### 6.1.1 Generation of a new self-signed certificate

This example shows how to create a certificate and copy it to a USB Memory drive.

```
qa-cli> cert--new --self-signed yes
qa-cli> cert --export --self-signed yes --name 192.168.1.21.crt
Please insert media into USB port.
**** Press any key to continue ****
```

#### 6.1.2 Generation of a Quantis Appliance certificate signed by an external CA

This example shows how to create a request to sign the certificate and copy it to a USB Memory drive.

```
qa-cli> cert--new --self-signed no
qa-cli> cert--export --self-signed no --name 192.168.1.21.csr
Please insert media into USB port.
**** Press any key to continue ****
```

Then sign your certificate request with your authority and generate the certificate in crt format for example:

```
$ openssl x509 -req -days 365 -in 192.168.1.21.csr -CA ca.crt -CAkey
ca.key -Cacreateserial -out 192.168.1.21.crt
```

and then plug your USB key and import your signed certificate:

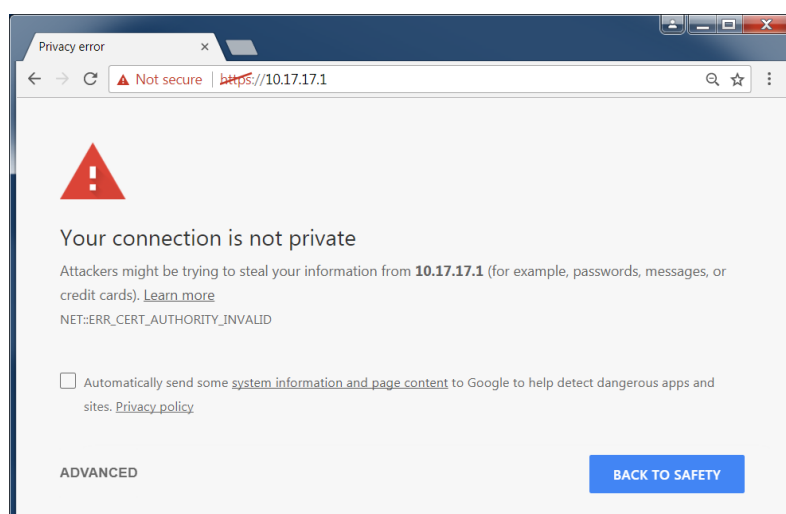
```
qa-cli> cert--import --name 192.168.1.21.crt --ca-file ca.crt
```

## 6.2 Security Exception Procedure

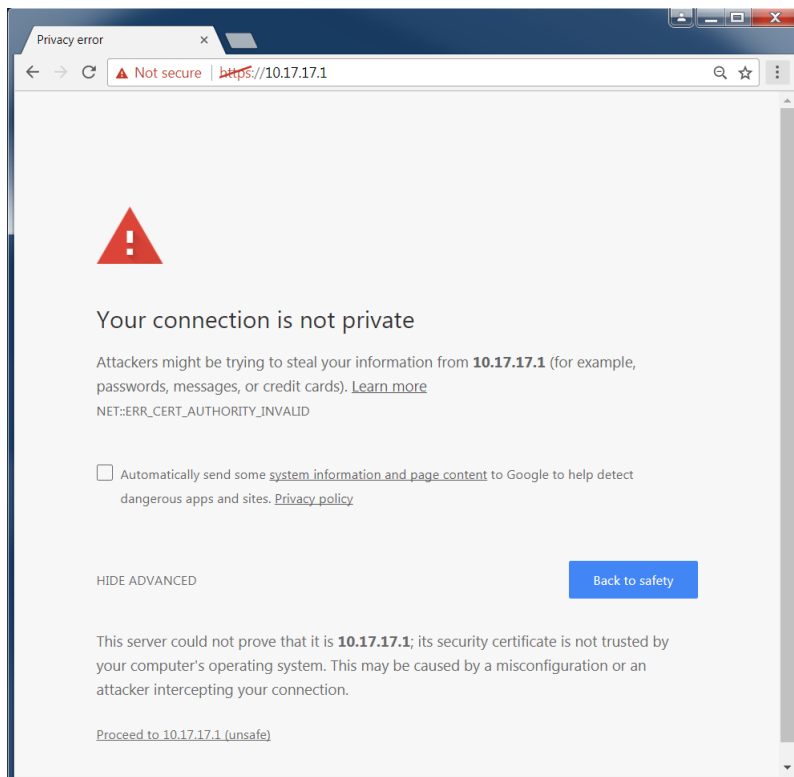
When using secure https connection, the browser is asking for adding security exceptions if the certificate is self-signed. Please go through the following steps to add security exceptions.

### 6.2.1 Chrome Procedure

Chrome will present the warning as follows:



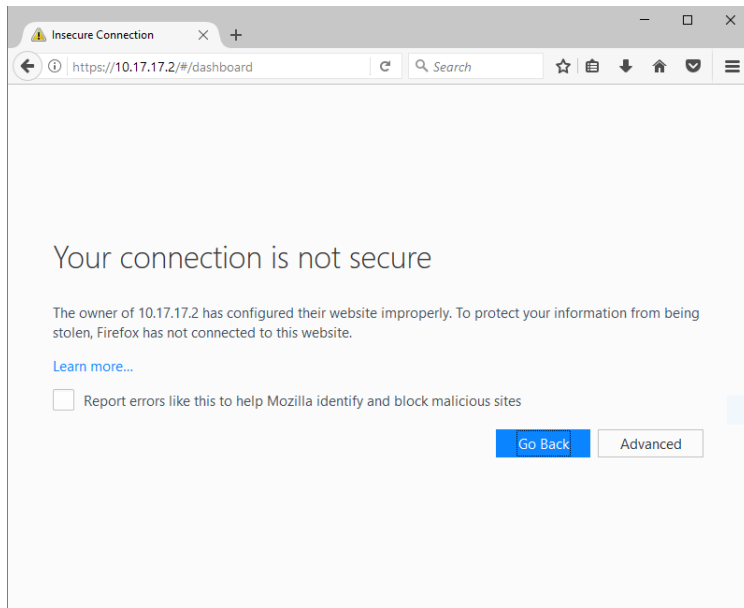
Click **Advanced**. The following window will be opened:



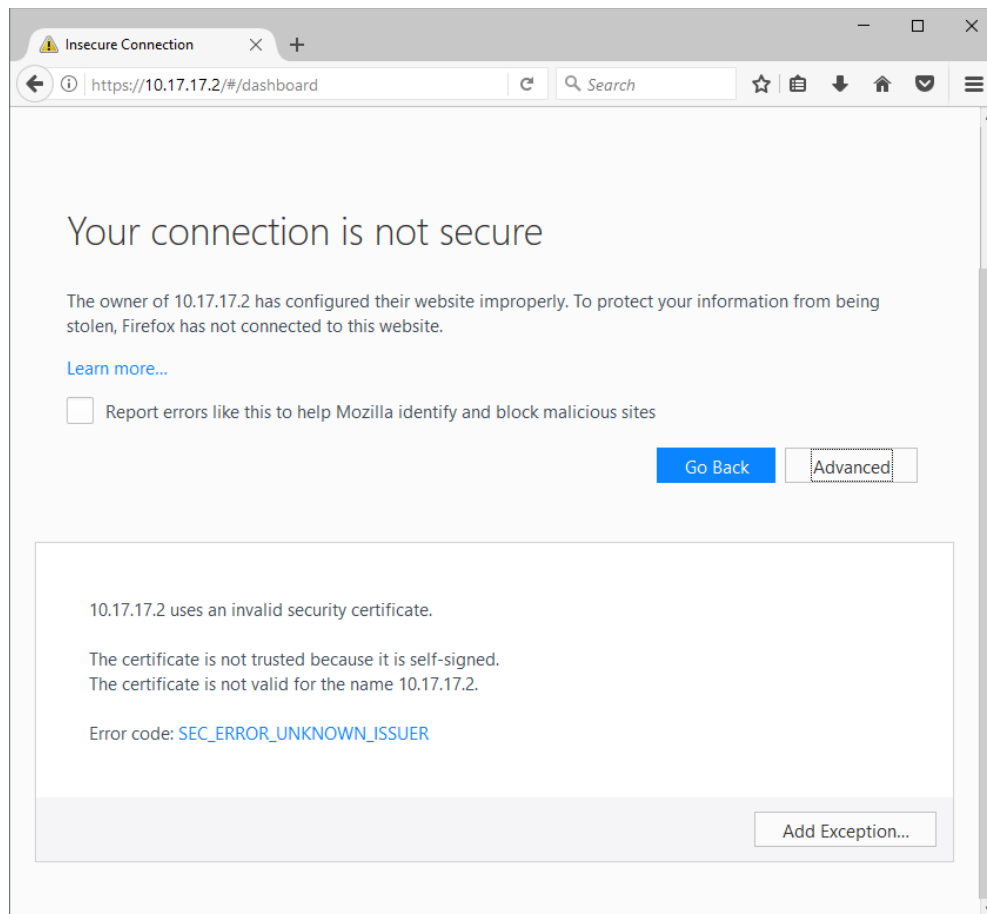
Press **“Proceed to 10.17.17.1 (unsafe)”** and you will be forwarded to the main page.

## 6.2.2 Firefox Procedure

Firefox will present the warning as follows:




Click **Advanced**. The following window will be opened:



Press **Add Exception**: The following window will be opened:

Add Security Exception



You are about to override how Firefox identifies this site.  
**Legitimate banks, stores, and other public sites will not ask you to do this.**

Server

Location:

Certificate Status

This site attempts to identify itself with invalid information.

**Wrong Site**  
The certificate belongs to a different site, which could mean that someone is trying to impersonate this site.

**Unknown Identity**  
The certificate is not trusted because it hasn't been verified as issued by a trusted authority using a secure signature.

☒ **P**ermanently store this exception

And finally click on **Confirm Security Exception** to access the Web Quantis page.

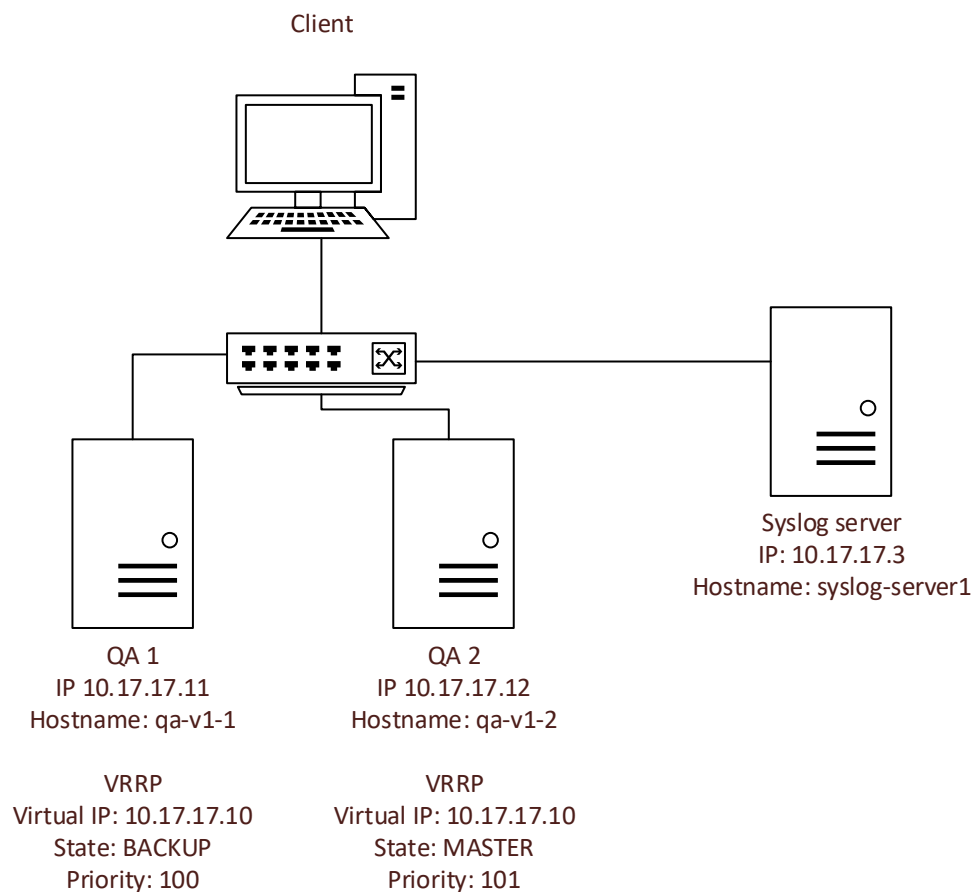


## 7 Hot Standby

An interruption of service can lead to a catastrophic consequence. To address this problem the Quantis appliance implements a Hot Standby feature. It uses the well-known keepalive and the VRRP protocol.

Two appliances and a common configuration are required. One appliance is active and the other one is idle. As soon as the active appliance is not responsive anymore the idle appliance one becomes active.

The client is requesting randomness to the Quantis Appliance though a virtual IP address.



In this example 2 appliances share a common virtual IP address 10.17.17.10. The first appliance is configured as BACKUP with a lower priority (100). The second appliance is configured as MASTER and has a higher priority (101). The client sends request to the virtual IP 10.17.17.10 transparently. If the active appliance goes down the passive appliance take over without the client notifying that. Finally, the

syslog messages are redirected to a dedicated syslog server to order to audit the keep alive activities.

## 7.1 Configuration of the Hot Standby

Log in the CLI of the appliance 1 and type:

```
qa-cli> monitor-log --type syslog --addr 10.17.17.3
qa-cli> keep-alive --state BACKUP --interfacenum 1 --interfacename eno1
qa-cli> keep-alive --priority 100 --interfacenum 1
qa-cli> keep-alive --enable true
```

Log in the CLI of the appliance 2 and type:

```
qa-cli> monitor-log --type syslog --addr 10.17.17.3
qa-cli> keep-alive --virtual-ip 10.17.17.10
qa-cli> keep-alive --state MASTER --interfacenum 1 --interfacename eno1
qa-cli> keep-alive --priority 101 --interfacenum 1
qa-cli> keep-alive --enable true
qa-cli> keep-alive
```

```
global_defs {
    notification_email {
        sysadmin@mydomain.com
        support@mydomain.com
    }
    notification_email_from lb1@mydomain.com
    smtp_server localhost
    smtp_connect_timeout 30
}
```

```
vrrp_instance VI_1 {
    state MASTER
    interface eno1
    virtual_router_id 51
    priority 101
    advert_int 1
    authentication {
        auth_type PASS
        auth_pass 1111
    }
    virtual_ipaddress {
        10.17.17.10
    }
}
```

```
vrrp_instance VI_2 {  
    state MASTER  
    interface eno2  
    virtual_router_id 51  
  
    priority 101  
    advert_int 1  
    authentication {  
        auth_type PASS  
        auth_pass 1111  
    }  
    virtual_ipaddress {  
        10.17.17.20  
    }  
}
```

The changes are highlighted in yellow.

## 7.2 Audit

Here is an example of audit log when an appliance become active:

```
Dec 6 17:46:20 qa-v1-2 Keepalived_vrrp[2061]: VRRP_Instance(VI_1) Entering MASTER STATE  
Dec 6 17:46:20 qa-v1-2 Keepalived_vrrp[2061]: VRRP_Instance(VI_1) setting protocol VIPs.  
Dec 6 17:46:20 qa-v1-2 Keepalived_vrrp[2061]: VRRP_Instance(VI_1) Sending gratuitous ARPs on eno1 for 10.17.17.10  
Dec 6 17:46:20 qa-v1-2 Keepalived_healthcheckers[2060]: Netlink reflector reports IP 10.17.17.10 added
```

### Warning

Certificate must be created (`cert-new`) with a common name (CN) for both appliance. If not, the Browser will return a security "Your connection is not secure" after every hot standby change.

### Warning

If the LAN1 IP address changes, the keep alive must be disabled and enabled.

## 8 Command Line Interface Description

This section describes every command in more details.

### 8.1 help: Get the list of available commands

NAME: help

DESCRIPTION: List all commands usage

```
qa-cli>help
Usage: help <command>

where <command> is one of:
  cert-export (Exports the QA certificate on an USB stick)
  cert-import (Imports a certificate signed by an external CA)
  cert-new (Create a new certificate)
  cert-show (Shows the actual certificate)
  clear (Clears the console)
  date (Displays or sets the local date and time)
  debug false (Disable debug mode)
  debug true (Enable debug mode)
  exit (Exits the shell)
  firmware-info (Shows information on the appliance)
  firmware-update update (Apply an update)
  help (List all commands usage)
  hostname (Get or set the hostname)
  keep-alive (Configure Hot Standby)
  list-usb (Lists the usb key contents)
  monitor-log (Monitor the log output)
  nic (Specify an ipv4 address)
  ping (Ping an IP address)
  pwd (Allows the user to change the CLI Password)
  reboot (Reboot the system)
  shutdown (Shutdown the system)
  system-info (Shows information on the appliance)
```

To get a command specific help type: **help *command***

For instance, for the *ping* command type:

```
qa-cli>help ping
COMMAND
ping <options...> - Ping an IP address

OPTIONS
--addr <IPV4> (Mandatory) - Specify the IP address to ping
--count <INT> (Default: 1) - Specify the number of requests

EXAMPLES
ping --addr 127.0.0.1
ping --addr 192.164.2.3 --count 10
```

The commands are listed by alphabetical order.

## 8.2 cert-new: New SSL certificate

NAME: cert-new

DESCRIPTION: Create a new certificate

OPTIONS:

--self-signed 'yes' to create a self-signed certificate

'no' to create a certificate request to be signed by an external certificate authority

EXAMPLE

```
qa-cli>cert-new --self-signed yes
Name: (10.17.17.11) [return]
Country: (CH) [return]
State: (Geneva) [return]
City: (Geneva City) [return]
Organization: (ID Quantique) [return]
```

```
Organization Unit: (RNG) [return]
eMail Address: (info@idquantique.com) [return]
Validity days: (365) [return]
Could you please confirm:
Name: 10.17.17.11
Country: CH
State: Geneva
City: Geneva City
Organization: Id Quantique
Organization Unit: RNG
Email: info@idquantique.com
Validity days: 365
Self-Signed: yes
Do you agree? (yes or no) yes
Generating a 2048 bit RSA private key
.....+++
.....+++
-----

Signature ok

qa-cli>cert-new --self-signed no
Name: (10.17.17.11) [return]
Country: (CH) [return]
State: (Geneva) [return]
City: (Geneva City) [return]
Organization: (ID Quantique) [return]
Organization Unit: (RNG) [return]
```

```
eMail Address: (info@idquantique.com) [return]
Validity days: (365) [return]
Could you please confirm:
Name: 10.17.17.11
Country: CH
State: Geneva
City: Geneva City
Organization: Id Quantique
Organization Unit: RNG
Email: info@idquantique.com
Validity days: 365
Self-Signed: no
Do you agree? (yes or no) yes
Generating a 2048 bit RSA private key
.....+++
.....+++
-----

New certificate request created successfully. To activate this
certificate, please export the request and sign it with a certificate
authority
```

You can choose the default value by typing “return” or choose the information that fits your requirements.

### 8.3 cert-export: Export a SSL certificate

NAME: cert-export

DESCRIPTION: Export the QA certificate on an USB stick

OPTIONS:

**--self-signed** yes to export a self-signed certificate



no to export a request to sign the certificate

**--name** the target filename of the certificate sign request.

#### EXAMPLE

```
qa-cli>cert-export --self-signed yes --name myCertificate.crt
Plug the usb device and press enter to continue
Certificate correctly exported

qa-cli>cert-export --self-signed no --name myRequest.csr
Plug the usb device and press enter to continue
Certificate correctly exported
```

## 8.4 cert-import: Import an SSL certificate

NAME: cert-import

DESCRIPTION: Imports a certificate signed by an external CA

OPTIONS:

**--name** the filename of the externally signed certificate in the root filesystem of the USB memory drive.

**--ca-file** the filename of the certificate of the external Certificate Authority (CA).

#### EXAMPLE

```
qa-cli>cert-import --name mySignedCertificate.crt --ca-file myCA.crt
Certificate imported successfully
```



## 8.5 cert-show: Display current SSL certificate detail

NAME: cert-show

DESCRIPTION: Shows the actual certificate

### EXAMPLE

```
qa-cli>cert-show
Certificate:
  Data:
    Version: 1 (0x0)
    Serial Number: 13755274384353211908 (0xbee48d2c8b673604)
    Signature Algorithm: sha1WithRSAEncryption
    Issuer: C=CH, L=Geneva City, ST=Geneva, O=Id Quantique, OU=RNG,
CN=10.17.17.11/emailAddress=info@idquantique.com
    Validity
      Not Before: Jul 26 14:17:45 2017 GMT
      Not After : Jul 26 14:17:45 2018 GMT
    Subject: C=CH, L=Geneva City, ST=Geneva, O=Id Quantique, OU=RNG,
CN=10.17.17.11/emailAddress=info@idquantique.com
    Subject Public Key Info:
      Public Key Algorithm: rsaEncryption
      Public-Key: (2048 bit)
      Modulus:
        00:c7:35:a2:da:37:7d:f9:a2:b8:e9:09:15:fe:d5:
        87:a7:d5:79:13:17:10:2b:7a:9f:48:1a:18:22:59:
        10:2f:bd:7e:35:ff:a4:8e:bc:37:70:75:8f:b4:02:
        4e:a0:fd:9b:1b:19:99:98:70:33:e0:8e:4e:73:d6:
        bb:a4:cd:0c:ef:27:31:30:b1:82:44:39:bf:64:38:
```

```
5e:7b:ce:fe:94:f2:50:34:97:46:68:5e:be:f1:57:
5c:7d:57:e1:d7:b2:bc:0d:ed:b6:6f:05:67:77:51:
65:5f:95:d8:9c:b7:29:cf:88:63:19:a5:5d:b9:2e:
cf:a8:d7:f5:b6:16:78:90:b1:2f:62:a8:1f:f8:58:
41:ca:54:6d:8b:9d:9e:3a:b0:23:81:a7:20:1b:9a:
7b:50:10:66:5c:15:fe:af:1a:0d:bc:6f:ea:eb:8f:
47:e4:87:dd:6c:d6:27:f8:b9:4e:35:82:48:00:94:
7d:39:9b:a9:5d:90:a3:d8:fe:76:4a:b3:2c:af:b5:
75:1f:3d:47:aa:6f:f4:33:f3:14:97:85:84:cd:4f:
84:f4:33:22:e8:60:14:ed:51:80:1d:89:7a:15:80:
06:c3:5b:1a:b9:d0:67:7a:40:be:32:8f:a3:0f:a0:
6c:5c:6e:c2:c1:9a:59:65:98:ba:2c:b1:38:57:ec:
10:d5
```

Exponent: 65537 (0x10001)

Signature Algorithm: sha1WithRSAEncryption

```
03:32:4d:dc:bd:6f:ff:af:4d:d6:83:d4:c7:d7:58:2d:b9:99:
3b:f0:67:97:10:2d:3d:0b:1c:35:bf:98:12:fe:f6:80:19:22:
ea:b4:66:8e:1e:4e:74:ea:81:a4:d0:d9:97:c1:b4:7a:9a:3f:
e1:6a:9f:95:ed:a8:7b:cd:40:42:9e:b4:71:ed:f0:a6:3f:06:
4a:a4:40:8f:be:b7:4a:e5:63:f8:4b:01:99:19:15:47:bd:6d:
2c:d7:76:bf:68:fc:4c:d2:c6:48:fe:d2:c3:e7:af:99:7c:f0:
34:32:ea:ee:69:a9:00:47:c7:a0:86:6f:25:2c:a5:23:62:5b:
33:c6:8a:b6:4f:91:db:4a:4c:a0:cd:bc:a9:23:d9:d3:ec:5b:
03:09:17:f9:36:a6:7f:fb:ad:8a:5f:0a:a5:a6:da:c1:18:b8:
12:23:0b:aa:e1:76:12:35:64:dc:03:30:98:76:56:81:64:f9:
55:7f:c0:0c:87:ce:fc:54:12:58:89:2e:51:e0:36:5b:cb:46:
5c:a7:cd:0f:93:e7:55:9b:c7:60:7b:d3:66:60:29:96:b1:f5:
```

```
c7:cd:6c:32:85:15:cd:ec:23:9b:82:40:63:10:2c:98:2d:d9:
5c:1f:cd:19:90:c7:5b:0c:ff:1f:45:29:1d:72:0f:db:cf:8f:
b6:92:fa:68
```

## 8.6 clear: Clear the console

NAME: clear

DESCRIPTION: Clears the console

### EXAMPLE

```
qa-cli>clear
```

## 8.7 date: Change Date and Time

NAME: date

DESCRIPTION: Displays or sets the local date and time

OPTIONS:

--set Set the date in the format YYYY-MM-DD hh:mm:ss

### EXAMPLE

```
qa-cli>date
Wednesday, July 25, 2017 4:11:04 PM CEST

qa-cli>date --set '2017-07-26 16:13:00'
Wed Jul 26 16:13:00 CEST 2017
```

## 8.8 exit: Exit the Command Line Interface

NAME: exit

DESCRIPTION: Exits the shell

### EXAMPLE

```
qa-cli>exit
```

## 8.9 firmware-info: Firmware Information

NAME: firmware-info

DESCRIPTION: Shows information on the appliance

### EXAMPLE

```
qa-cli>firmware-info
Firmware name: QuantisAppliance
Firmware version: 1.0.0 20170921
```

To apply an update the user needs to plug a USB drive containing an official “Update File” delivered by ID Quantique.

## 8.10 firmware-update: Firmware Update

NAME: firmware-update

DESCRIPTION: Apply an update

### EXAMPLE



```
qa-cli>firmware-update update
Update finished
```

## 8.11 hostname: Set network hostname

NAME: hostname

DESCRIPTION: Get or set the hostname

OPTIONS:

**--name** Specify the new hostname

EXAMPLE

```
qa-cli>hostname
qa.srv1
qa-cli>hostname --name qa.srv2
Hostname correctly changed to 'qa.srv2'
```

## 8.12 keep-alive: Configure Hot Standby

An example is provided in part [7.4](#)

NAME: keep-alive

DESCRIPTION: Configure the keep alive for Hot Standby

OPTIONS:

**--enable** [true | false] enable the Hot Standby. Must be identical on both appliance

**--priority** [1..254] numeric value. High value has higher priority. Must be different on both appliance.

**--state** [MASTER | BACKUP] Define the initial state. Must be different on both appliance.

**--virtual-ip** The shared virtual IP address. Must be identical on both appliance.

**--interfacenum** [1|2] This species the VRRP instance, i.e. network interface to configure the keep-alive functionality on. This is to allow interfaces to be configured separately.

#### EXAMPLE

```
qa-cli> keep-alive --interfacenum 1 --virtual-ip 10.17.17.10
qa-cli> keep-alive --state MASTER --interfacenum 1
qa-cli> keep-alive --priority 101 --interfacenum 1
qa-cli> keep-alive --enable true
qa-cli> keep-alive
```

```
global_defs {
    notification_email {
        sysadmin@mydomain.com
        support@mydomain.com
    }
    notification_email_from lbl@mydomain.com
    smtp_server localhost
    smtp_connect_timeout 30
}
```

```
vrrp_instance VI_1 {
    state MASTER
    interface eno1
    virtual_router_id 51
    priority 101
    advert_int 1
    authentication {
        auth_type PASS
        auth_pass 1111
    }
    virtual_ipaddress {
        10.17.17.10
    }
}
```

```
vrrp_instance VI_2 {
    state MASTER
    interface eno2
    virtual_router_id 51

    priority 101
    advert_int 1
    authentication {
```

```
    auth_type PASS
    auth_pass 1111
  }
  virtual_ipaddress {
    10.17.17.20
  }
}
```

## 8.13 list-usb: List files on a USB memory drive

NAME: list-usb

DESCRIPTION: Lists the usb key contents

### EXAMPLE

```
qa-cli>list-usb
total 8
drwxr-xr-x. 2 root root 4096 Jan  1  1970 .
drwxr-xr-x. 3 root root  17 Aug 21 16:57 ..
-rwxr-xr-x. 1 root root 1322 Aug 21 16:57 myCertificate.pem
```

## 8.14 monitor-log: Manage Monitor Log

NAME: monitor-log

DESCRIPTION: Monitor the log output

### OPTIONS:

- addr Specify the IP address of the target syslog server
- type Specifiy the type of output (syslog)

## EXAMPLE

```
qa-cli>monitor-log --type syslog
Current log address: 10.254.254.1
qa-cli>monitor-log --type syslog --addr 10.254.254.1
New log address set successfully.
```

## 8.15 nic: Configure Network Interface Card

NAME: nic

DESCRIPTION: Specify an ipv4 address

## OPTIONS:

**--addr** Specify the IPv4 address and the netmask of the QA

**--gateway** Specify the IPv4 gateway of the QA

**--id** Specify the interface to configure (LAN1 or LAN2)

## EXAMPLE

```
qa-cli>nic --id 1 --addr 10.17.17.2/8 --gateway 10.0.0.1
Address changed
Gateway changed
*****
GENERAL.DEVICE:          eno1
GENERAL.TYPE:            ethernet
GENERAL.HWADDR:          0C:C4:7A:95:88:AC
GENERAL.MTU:              1500
GENERAL.STATE:            100 (connected)
GENERAL.CONNECTION:      System eno1
GENERAL.CON-PATH:        /org/freedesktop/NetworkManager/ActiveConnection/10
WIRED-PROPERTIES.CARRIER: on
IP4.ADDRESS[1]:           10.17.17.2/8
IP4.GATEWAY:              10.0.0.1
IP4.DNS[1]:               10.0.0.1
IP6.ADDRESS[1]:           fe80::ec4:7aff:fe95:88ac/64
IP6.GATEWAY:
```

\*\*\*\*\*



```
GENERAL.DEVICE:          eno2
GENERAL.TYPE:            ethernet
GENERAL.HWADDR:          0C:C4:7A:95:88:AD
GENERAL.MTU:             1500
GENERAL.STATE:           100 (connected)
GENERAL.CONNECTION:      System eno2
GENERAL.CON-PATH:        /org/freedesktop/NetworkManager/ActiveConnection/11
WIRED-PROPERTIES.CARRIER: off
IP4.ADDRESS[1]:          10.17.17.101/8
IP4.GATEWAY:             10.0.0.1
IP4.DNS[1]:              10.0.0.1
IP6.ADDRESS[1]:          fe80::ec4:7aff:fe95:88ad/64
IP6.GATEWAY:
*****
```

## 8.16 ping: Test LAN connection

NAME: ping

DESCRIPTION: Ping an IP Address

OPTIONS:

--addr Specify the IP address to ping  
--count number of request (default 1)

EXAMPLE

```
qa-cli>ping --addr 10.17.17.2 --count 3
ping host /10.17.17.2
host status: reachable
host status: reachable
host status: reachable
packets lost: 0%
```

## 8.17 pwd: Change Password

NAME: **pwd**

DESCRIPTION: Allows the user to change the CLI Password.

#### EXAMPLE

```
qa-cli>pwd  
Enter the new password: *****  
Enter the new password once again: *****  
Password correctly set
```

## 8.18 reboot: Reboot Appliance

NAME: **reboot**

DESCRIPTION: Reboot the system.

#### EXAMPLE

```
qa-cli>reboot
```

## 8.19 shutdown: Shutdown Appliance

NAME: **shutdown**

DESCRIPTION: Shutdown the system.

#### EXAMPLE

```
qa-cli>shutdown
```

## 8.20 system-info: system identification

NAME: system-info

DESCRIPTION: Shows information on the appliance

### EXAMPLE

```
qa-cli>system-info
Manufacturer: IDQuantique
Product Name: Quantis-Appliance (version: QA-v1-A0)
Serial number: 1739002S020
RNG type: Quantis-16Mbit/s
```

## 9 The command line interface allows configuring the Quantis Appliance. Refer to section “Safety and Maintenance

### 9.1 Transport and storage

Maintain a temperature range within specifications when transporting or storing the unit.

Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- pack the unit in the original packing material when shipping
- store unit at room temperature in a clean and dry area
- avoid high humidity or large temperature fluctuations
- keep the unit out of direct sunlight
- avoid unnecessary shock and vibration

### 9.2 Safety precautions

The following safety precautions must be observed during the operation and servicing of the unit. Failure to comply with these precautions or with specific indications elsewhere in this manual violates safety standards of intended use of the unit. IDQ assumes no liability for the user's failure to comply with these requirements.

- This unit is intended for indoor use only.
- Unit covers cannot be removed during operation
  - Before powering on the unit, all grounding terminals, extension cords, and devices

connected to it should be connected to a protective ground via a ground socket. Any interruption of the protective grounding is a potential shock hazard and may cause personal injury.

- Whenever the ground protection is impaired, the unit is not to be used and must be secured against any accidental or unintended operation.
- Any adjustments, maintenance, and repair should be handled and carried out only by IDQuantique personnel while power cable is disconnected. Do not attempt internal service or adjustment. Do not replace any components.
- Operation of any electrical instrument around flammable gases or fumes constitutes a major safety hazard.
- Installation of replacement parts or modification of the unit should be carried out by IDQuantique personnel only.
- Certain components inside the unit – e.g. capacitors – may be charged even if the unit has been disconnected from its electrical supply.
- What is not explicitly allowed in this manual is forbidden.

### Warning

To avoid electrical shock, do not operate the unit if there are signs of damage to any part of the appliance outer surface (covers, panels, etc.).

To avoid serious injury, the following precautions must be observed before powering on the unit.

- If the unit is to be powered via an auto-transformer for voltage reduction, the common terminal must be connected to the grounded power source pole.
- Insert the plug into a power outlet with a protective ground contact. Do not use an extension cord without a protective conductor.
- Before powering on the unit, the protective ground terminal of the unit must be connected to a protective conductor using the unit power cord.
- Do not tamper with the protective ground terminal.

## 9.3 General Maintenance

There are no user-serviceable components in the Quantis appliance, notwithstanding the procedure described in this section. The Quantis appliance has been designed to require minimum maintenance and to provide reliable performance.

To help ensure long, trouble-free operation:

- keep the Quantis Appliance free of dust
- do not spill liquids on or into the unit. If the unit does get wet, turn off the power immediately and let the unit dry completely.

- clean the Quantis appliance casing with a slightly damp (with water) cloth.

## 10 Warranty

IDQ warrants this equipment against defect in material and workmanship for a period of twelve months from the date of original shipment. The warranty and technical support can be extended due to the request. For more info please contact [sales@idquantique.com](mailto:sales@idquantique.com). IDQ also warrants that this equipment will meet applicable specifications under normal use. During the warranty period, IDQ will, at its discretion, repair, replace, or issue credit for any defective product.

### Important

The warranty can become void if:

- the equipment has been tampered with, repaired, or worked upon by unauthorized individuals or non-IDQ personnel
- the warranty sticker has been removed
- the case has been opened
- the equipment serial number has been altered, erased, or removed
- the equipment has been misused, neglected or damaged by accident

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL IDQ BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

### Note

For more information, please contact [info@idquantique.com](mailto:info@idquantique.com).

### 10.1 Liability

IDQ shall not be liable for damages resulting from the use of the purchased product, nor shall be responsible for any failure in the performance of other items to which the purchased product is connected or the operation of any system of which the purchased product may be a part.

### 10.2 Exclusions

IDQ reserves the right to make changes in the design or construction of any of its products at any time without incurring any obligation to make changes whatsoever on units purchased.

### 10.3 Certification

IDQ certifies that this equipment met its published specifications at the time of shipment from the factory.

Getting Started



