

SNR for MIMO G.hn Links

Protocol 2.0



Date: January 20th 2022

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Setup 1:

Physical setup:

- On a 500 ft. binder.
- One G.hn signal in a binder on the first pair only, the others must be disconnected.
- On the GAM

Notch setting:

- Notch at **0 dB**
- The frequency range is from **3.5 MHz** to **100 MHz**.

Measurements:

- SNR Probe
- PSD_Rx
- NOISE

The measurements are on one port of the GAM, make sure it's the middle (ex: EndPoint: 00-0e-d8-14-c1-50)

Take the measures in **upstream** and **downstream**

Summary of what to hand-in:

- **SNR** Probe graph **Upstreams**
- Raw data from **SNR** Probe graph **Upstreams**
- **SNR** Probe graph **Downstream**
- Raw data from **SNR** Probe graph **Downstream**
- **PSD_Rx** graph **Upstreams**
- Raw data from **PSD_Rx** graph **Upstreams**
- **PSD_Rx** graph **Downstream**
- Raw data from **PSD_Rx** graph **Downstream**
- **NOISE** graph **Upstreams**
- Raw data from **NOISE** graph **Upstreams**
- **NOISE** graph **Downstreams**
- Raw data from **NOISE** graph **Downstream**

Setup 2:

Physical setup:

- On a 500 ft. cable.
- One G.hn signal in a binder on the first pair only, the others must be disconnected.
- On the GAM

Notch setting:

- Notch at **10 dB**
- The frequency range is from **3.5 MHz** to **100 MHz**.

Measurements:

- SNR Probe
- PSD_Rx
- NOISE

The measurements are on one port of the GAM, make sure it's the middle (ex: EndPoint: 00-0e-d8-14-c1-50)

Take the measures in **upstream** and **downstream**

Summary of what to hand-in:

- **SNR Probe graph Upstreams**
- Raw data from **SNR Probe graph Upstreams**
- **SNR Probe graph Downstream**
- Raw data from **SNR Probe graph Downstream**
- **PSD_Rx graph Upstreams**
- Raw data from **PSD_Rx graph Upstreams**
- **PSD_Rx graph Downstream**
- Raw data from **PSD_Rx graph Downstream**
- **NOISE graph Upstreams**
- Raw data from **NOISE graph Upstreams**
- **NOISE graph Downstreams**
- Raw data from **NOISE graph Downstream**

Setup 3:

Physical setup:

- On a 500 ft. cable.
- 8 pairs of G.hn signals in a binder (All are plugged in)
- On the GAM

Notch setting:

- Notch at **0 dB**
- The frequency range is from **3.5 MHz to 100 MHz**.

Measurements:

- SNR Probe
- PSD_Rx
- NOISE

The measurements are on one port of the GAM, make sure it's the middle (ex: EndPoint: 00-0e-d8-14-c1-50)

Take the measures in **upstream** and **downstream**

Summary of what to hand-in:

- **SNR** Probe graph **Upstreams**
- Raw data from **SNR** Probe graph **Upstreams**
- **SNR** Probe graph **Downstream**
- Raw data from **SNR** Probe graph **Downstream**
- **PSD_Rx** graph **Upstreams**
- Raw data from **PSD_Rx** graph **Upstreams**
- **PSD_Rx** graph **Downstream**
- Raw data from **PSD_Rx** graph **Downstream**
- **NOISE** graph **Upstreams**
- Raw data from **NOISE** graph **Upstreams**
- **NOISE** graph **Downstreams**
- Raw data from **NOISE** graph **Downstream**

Setup 4:

Physical setup:

- On a 500 ft. cable.
- 8 pairs of G.hn signals in a binder (All are plugged in)
- On the GAM

Notch setting:

- Notch at **10 dB**
- The frequency range is from **3.5 MHz** to **100 MHz**.

Measurements:

- SNR Probe
- PSD_Rx
- NOISE

The measurements are on one port of the GAM, make sure it's the middle (ex: EndPoint: 00-0e-d8-14-c1-50)

Take the measures in **upstream** and **downstream**

Summary of what to hand-in:

- **SNR Probe graph Upstreams**
- Raw data from **SNR Probe graph Upstreams**
- **SNR Probe graph Downstream**
- Raw data from **SNR Probe graph Downstream**
- **PSD_Rx graph Upstreams**
- Raw data from **PSD_Rx graph Upstreams**
- **PSD_Rx graph Downstream**
- Raw data from **PSD_Rx graph Downstream**
- **NOISE graph Upstreams**
- Raw data from **NOISE graph Upstreams**
- **NOISE graph Downstreams**
- Raw data from **NOISE graph Downstream**

Setup 5:

Physical setup:

- On a 500 ft. binder
- G.hn signal with 7 pairs VDSL2 signals in the same binder (So disconnect all other G.hn ports, make sure the middle pair is the one connected to the first port)
- On the GAM

Notch setting:

- Notch at **0 dB**
- The frequency range is from **3.5 MHz** to **100 MHz**.

Measurements:

- SNR Probe
- PSD_Rx
- NOISE

The measurements are on one port of the GAM, make sure it's the middle (ex: EndPoint: 00-0e-d8-14-c1-50)

Take the measures in **upstream** and **downstream**

Summary of what to hand-in:

- **SNR** Probe graph **Upstreams**
- Raw data from **SNR** Probe graph **Upstreams**
- **SNR** Probe graph **Downstream**
- Raw data from **SNR** Probe graph **Downstream**
- **PSD_Rx** graph **Upstreams**
- Raw data from **PSD_Rx** graph **Upstreams**
- **PSD_Rx** graph **Downstream**
- Raw data from **PSD_Rx** graph **Downstream**
- **NOISE** graph **Upstreams**
- Raw data from **NOISE** graph **Upstreams**
- **NOISE** graph **Downstreams**
- Raw data from **NOISE** graph **Downstream**

Setup 6:

Physical setup:

- On a 500 ft. cable.
- G.hn signal with 7 pairs VDSL2 signals in the same binder (So disconnect all other G.hn ports, make sure the middle pair is the one connected to the first port)
- On the GAM

Notch setting:

- Notch at **0 dB**
- The frequency range is from **3.5 MHz to 100 MHz**.

Measurements:

- SNR Probe
- PSD_Rx
- NOISE

The measurements are on one port of the GAM, make sure it's the middle (ex: EndPoint: 00-0e-d8-14-c1-50)

Take the measures in **upstream** and **downstream**

Summary of what to hand-in:

- **SNR** Probe graph **Upstreams**
- Raw data from **SNR** Probe graph **Upstreams**
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- Raw data from **PSD_Rx** graph **Upstreams**
- **PSD_Rx** graph **Downstream**
- Raw data from **PSD_Rx** graph **Downstream**
- **NOISE** graph **Upstreams**
- Raw data from **NOISE** graph **Upstreams**
- **NOISE** graph **Downstreams**
- Raw data from **NOISE** graph **Downstream**

How to get the raw data

To access the data, you need to first be at the consol. The first thing to do is to open up the terminal. Once the terminal is open, input the following commands:

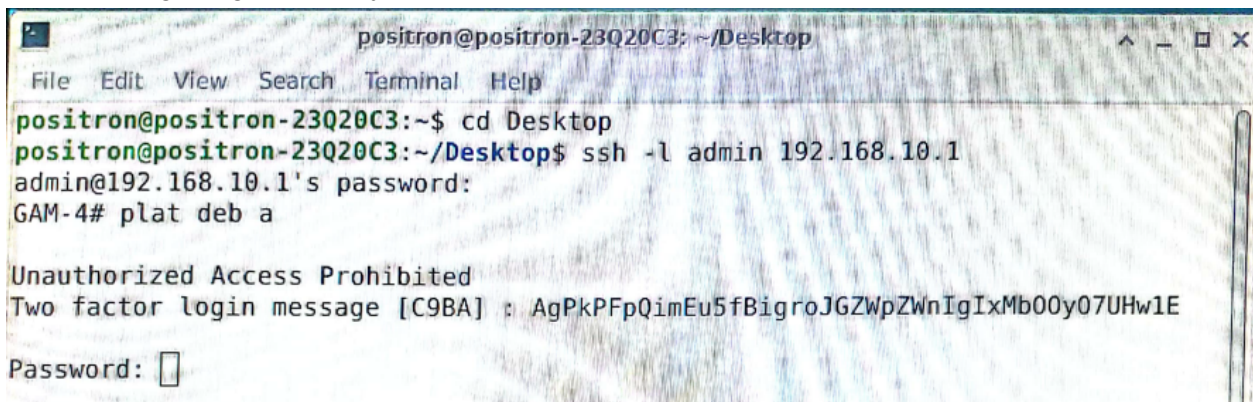
```
cd Desktop
```

```
ssh -l admin 192.168.10.1
```

Once those commands are inputted you will be asked to put a password, the password to put in is "password". When the password is entered follow up with this command:

```
plat deb a
```

The following image is what you are supposed to see.



```
positron@positron-23Q20C3: ~/Desktop
File Edit View Search Terminal Help
positron@positron-23Q20C3:~$ cd Desktop
positron@positron-23Q20C3:~/Desktop$ ssh -l admin 192.168.10.1
admin@192.168.10.1's password:
GAM-4# plat deb a

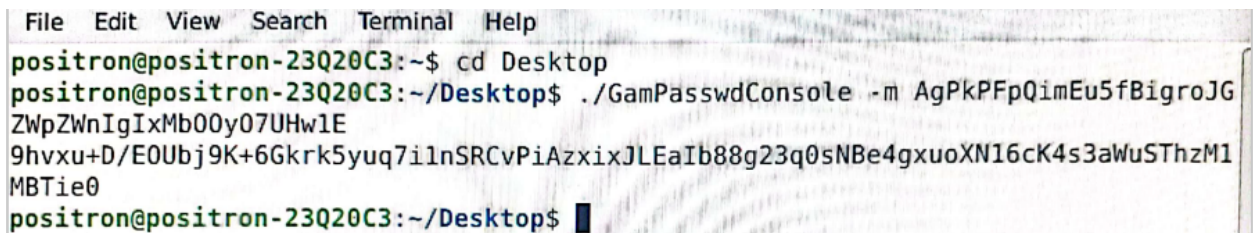
Unauthorized Access Prohibited
Two factor login message [C9BA] : AgPkPFpQimEu5fBigroJGZWpZWnIglxMb00y07UHw1E
Password: [ ]
```

In order get the generated password you need to open a 2nd terminal and copy the login message, in this scenario the login message to copy is AgPkPFpQimEu5fBigroJGZWpZWnIglxMb00y07UHw1E. In the 2nd terminal input the following commands:

```
Cd Desktop
```

```
./GamPasswdConsole -m "the login message"
```

Once those commands are entered this is what you are supposed to see:



```
File Edit View Search Terminal Help
positron@positron-23Q20C3:~$ cd Desktop
positron@positron-23Q20C3:~/Desktop$ ./GamPasswdConsole -m AgPkPFpQimEu5fBigroJG
ZWpZWnIglxMb00y07UHw1E
9hvXu+D/E0Ubj9K+6Gkrk5yuq7ilnSRCvPiAzzixJLEaIb88g23q0sNBe4gxuoXN16cK4s3aWuSThzM1
MBTie0
positron@positron-23Q20C3:~/Desktop$ █
```


With this, you have the newly generated password, you need to copy it and put it in the 1st terminal. The following image will show you what you should copy.

```

positron@positron-23Q20C3: ~/Desktop
File Edit View Search Terminal Help
positron@positron-23Q20C3:~$ cd Desktop
positron@positron-23Q20C3:~/Desktop$ ./GamPasswdConsole -m AgPkPFpQimEu5fBigroJG
ZWpZWnIgIxMb00y07UHw1E
9hvXu+D/E0Ubj9K+6Gkrk5yuq7i1nSRCvPiAzzixJLEaIb88g23q0sNBe4gxuoXN16cK4s3aWuSThzM1
MBTie0
positron@positron-23Q20C3:~/Desktop$

```

Once you copied this newly generated password, paste it in the 1st terminal, like showed here:

```

positron@positron-23Q20C3: ~/Desktop
File Edit View Search Terminal Help
positron@positron-23Q20C3:~$ cd Desktop
positron@positron-23Q20C3:~/Desktop$ ssh -l admin 192.168.10.1
admin@192.168.10.1's password:
GAM-4# plat deb a

Unauthorized Access Prohibited
Two factor login message [C9BA] : AgPkPFpQimEu5fBigroJGZWpZWnIgIxMb00y07UHw1E
Password: AgPkPFpQimEu5fBigroJGZWpZWnIgIxMb00y07UHw1E

```

And here are the results:

```

Unauthorized Access Prohibited
Two factor login message [C9BA] : AgPkPFpQimEu5fBigroJGZWpZWnIgIxMb00y07UHw1E

Password: 9hvXu+D/E0Ubj9K+6Gkrk5yuq7i1nSRCvPiAzzixJLEaIb88g23q0sNBe4gxuoXN16cK4s
3aWuSThzM1MBTie0
auth granted

WARNING: The use of 'debug' commands may negatively impact system behavior.
Do not enable unless instructed to. (Use 'platform debug deny' to disable
debug commands.)

NOTE: 'debug' command syntax, semantics and behavior are subject to change
without notice.

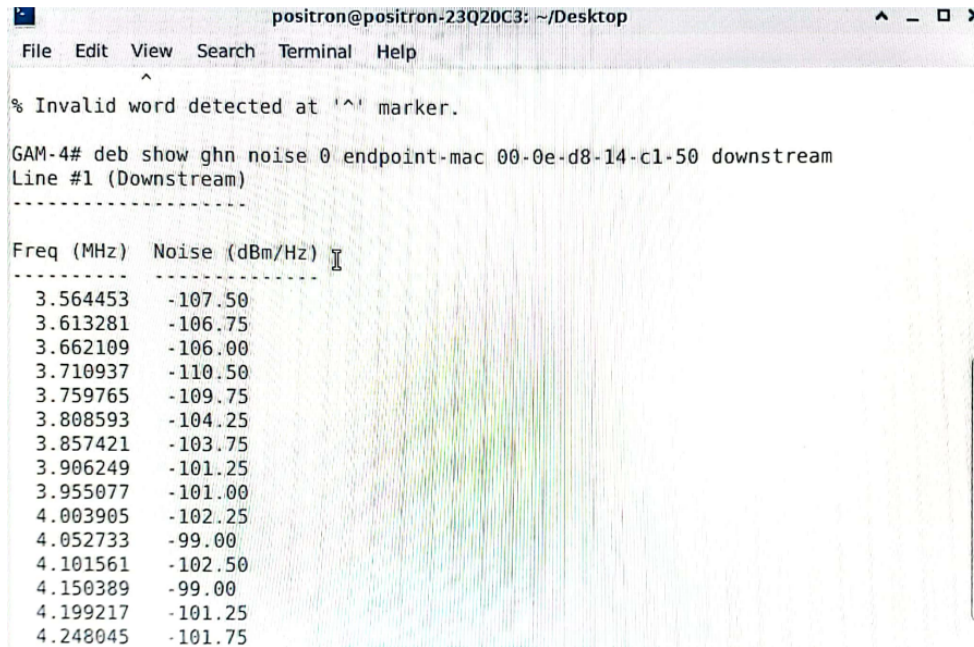
GAM-4#

```

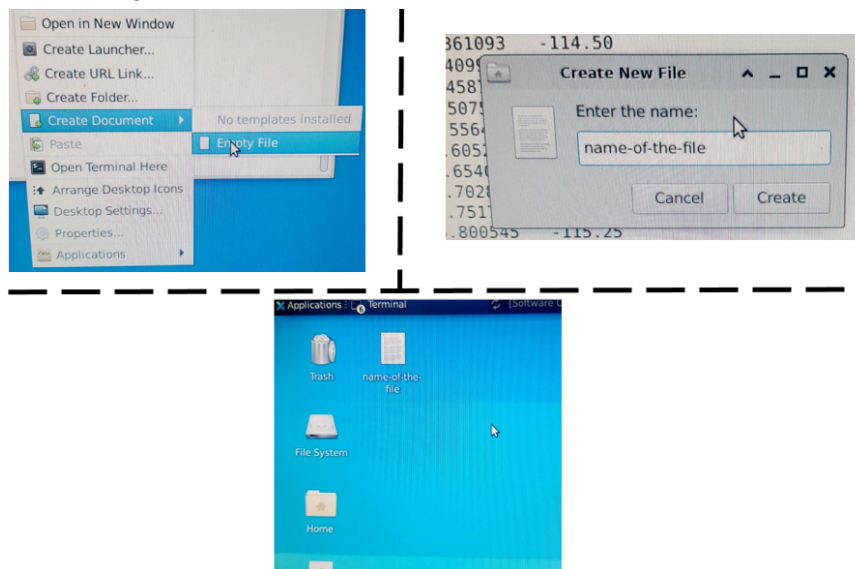
From here you can access the various data (**noise**, **psd** and **snrprobe**). To get the information input the following command:

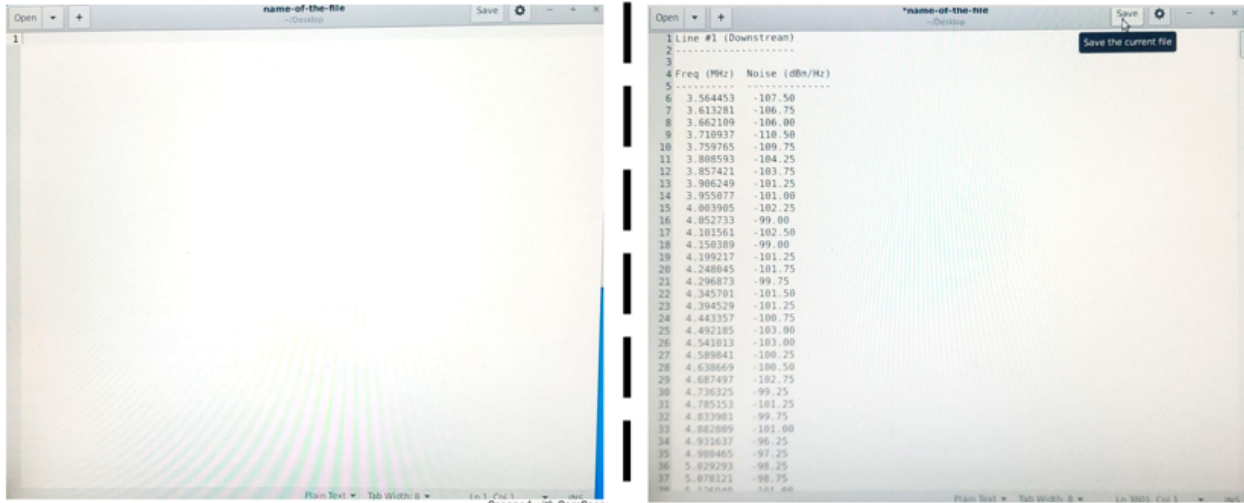
Deb show ghn "name of the measurement" "number associated to port" endpoint-mac "mac address of the port" "upstream or downstream"

Here is an example when looking for **noise** measurements, on the first port (0) and from the **downstream** perspective.



Now you need to copy the data into a text file. So first copy the data, then create a text file. Here are images showing how:





Once the document is saved, put it on a flash drive and take it anywhere you want.

How the physical setup is made to see impact of VDSL/G.hn circuits

