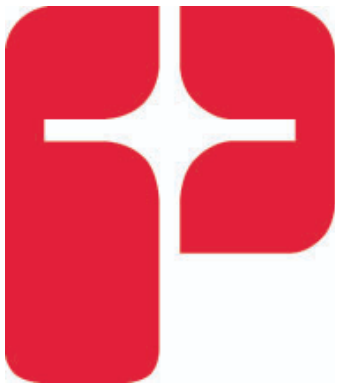
POSITRON
Access Solutions

SNR for MIMO G.hn Links

Protocol 2.0



Date: January 20th 2022

Protocol 2.0

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 **SNR** Probe graph **Downstream**
- **PSD_Rx** graph **Upstreams**
- Raw data from **PSD_Rx** graph **Upstreams**
- **PSD_Rx** graph **Downstream**
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- 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:

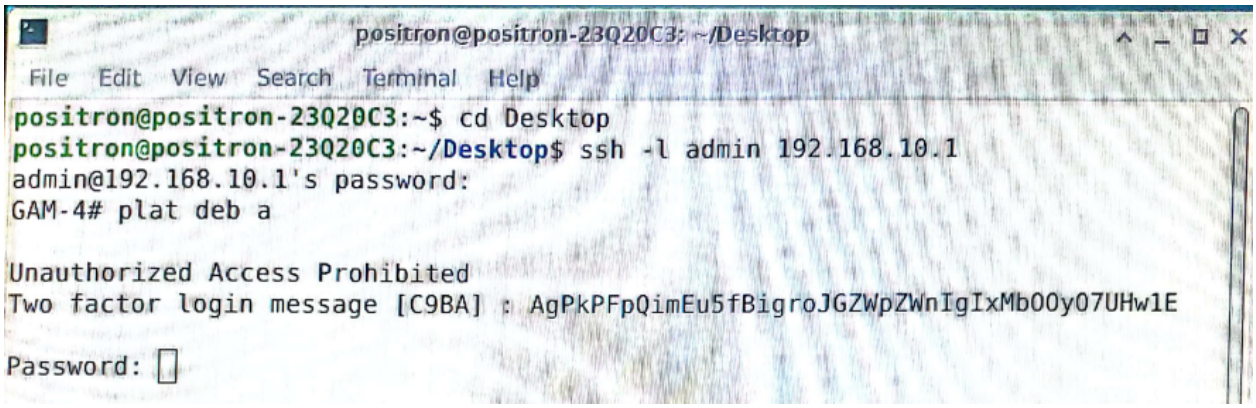
cd Desktop

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.

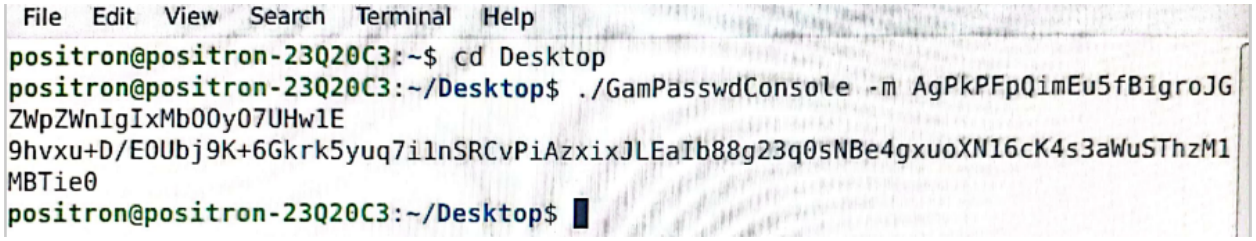


In order get the generated password you need to open a 2nd terminal and copy the login message, in this scenario the login message to copy is AgPkPFpQimEu5fBigroJGZWpZWnIgIxMb00y07UHw1E. In the 2nd terminal input the following commands:

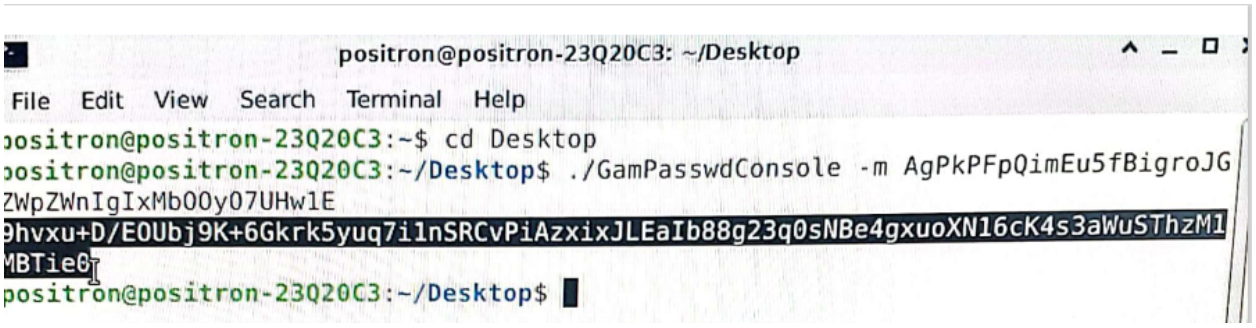
Cd Desktop

./GamPasswdConsole -m ‘’the login message’’

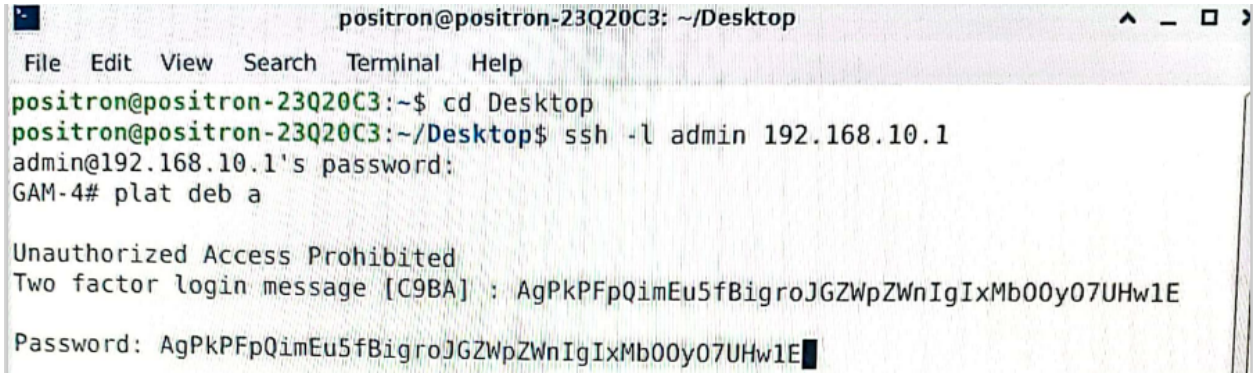
Once those commands are entered this is what you are supposed to see:



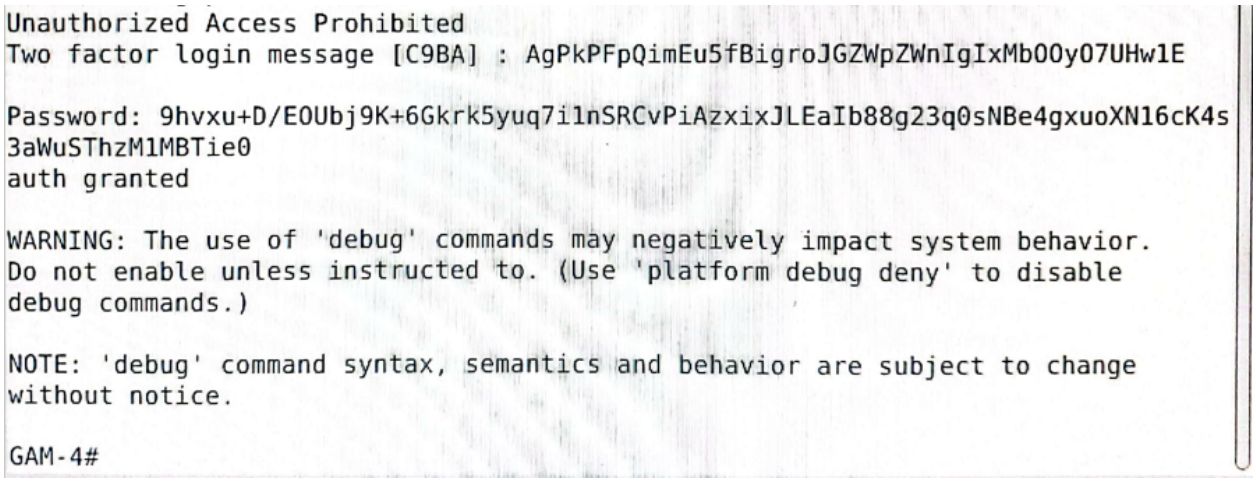
With this, you have the newly generated password, you need to copy it and put it in the 1rst terminal. The following image will show you what you should copy.



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



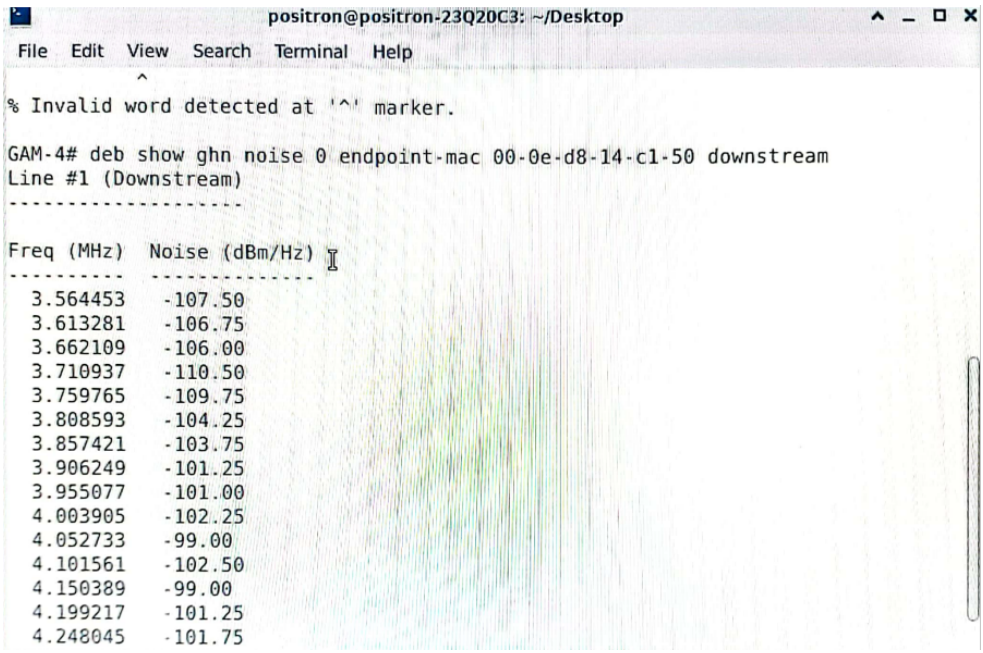
And here are the results:



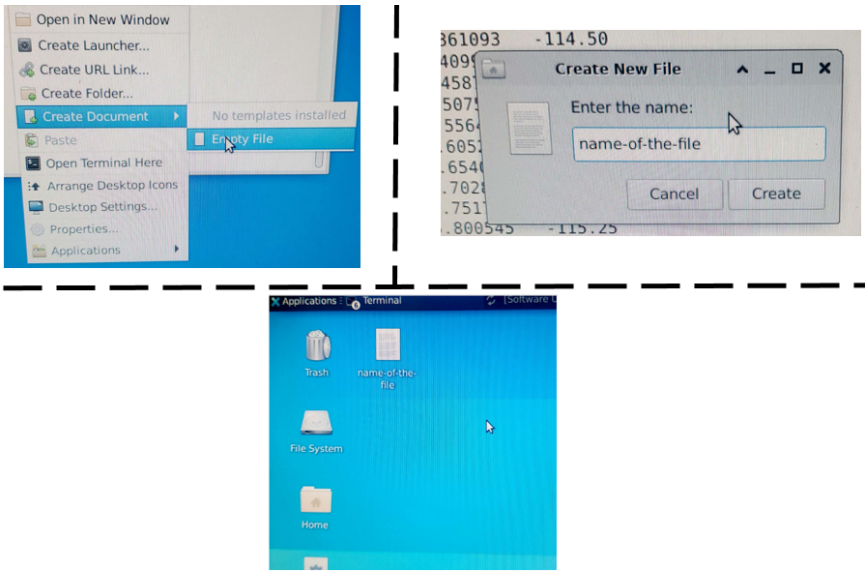
From here you can access the various data (**noise**, **psd** and **snrprobe**). To get the information input the following command:

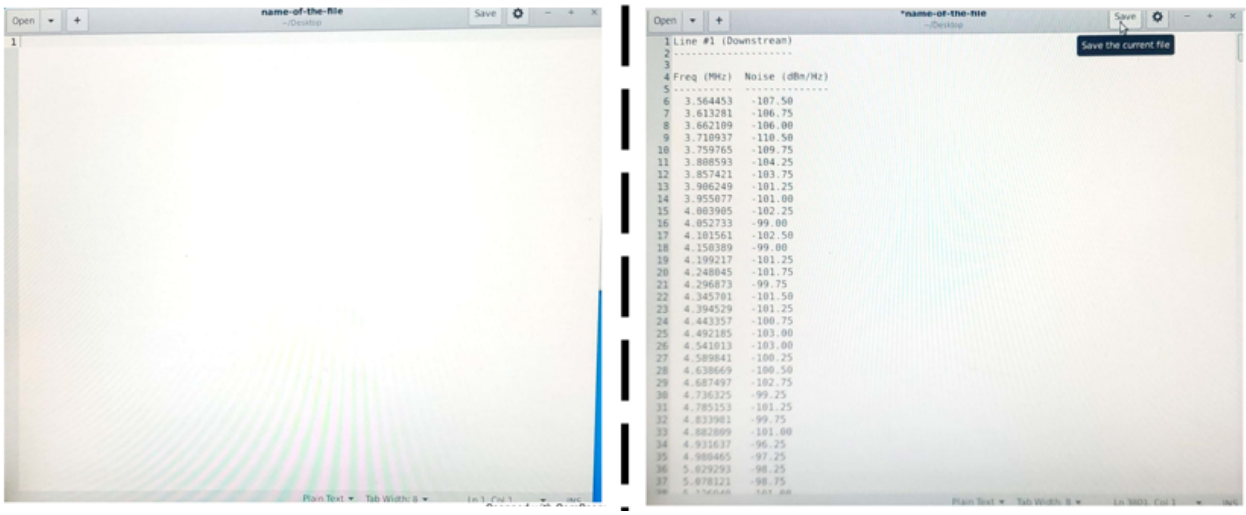
Deb show ghn ‘’name of the measurement’’ ‘’number associated to port’’ endpoint-mac ‘’mac address of the port’’ ‘’upstream or downstream’’

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