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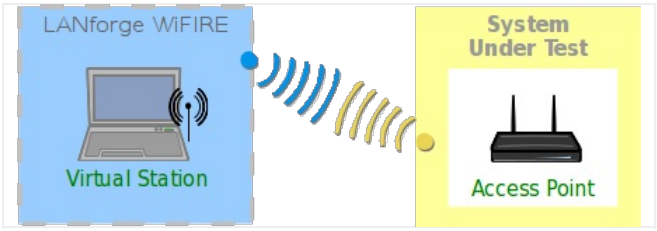
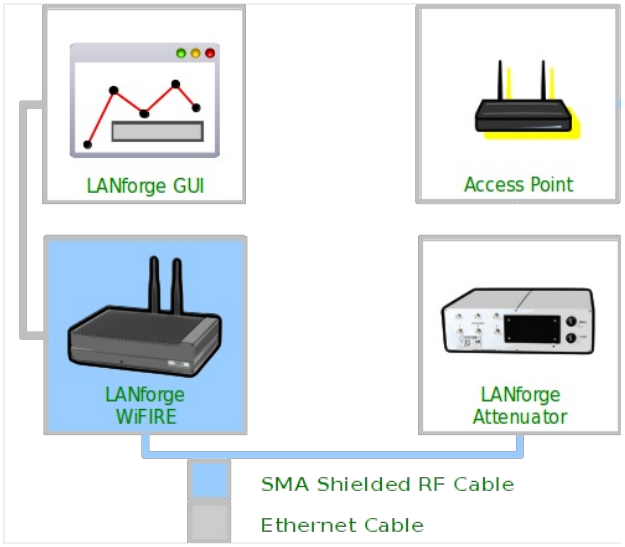
LANforge Scripted Attenuation of a WiFi Connection

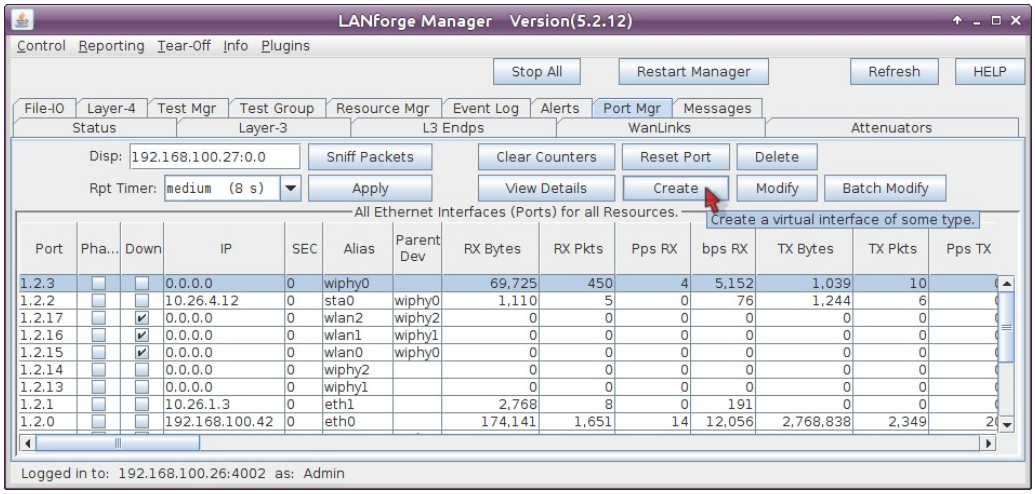
Goal: Operate the CT703 WiFi Attenuator with a script to see the effect on a Layer-3 connection.

The LANforge GUI provides scripting support for the CT703 Attenuator. This cookbook provides a basic example of how to graph connection throughput and signal strength with a single station connection. Use this example as a basis for building more complex attenuation scripts. Requires LANforge 5.2.11+ and CT703 Attenuator.

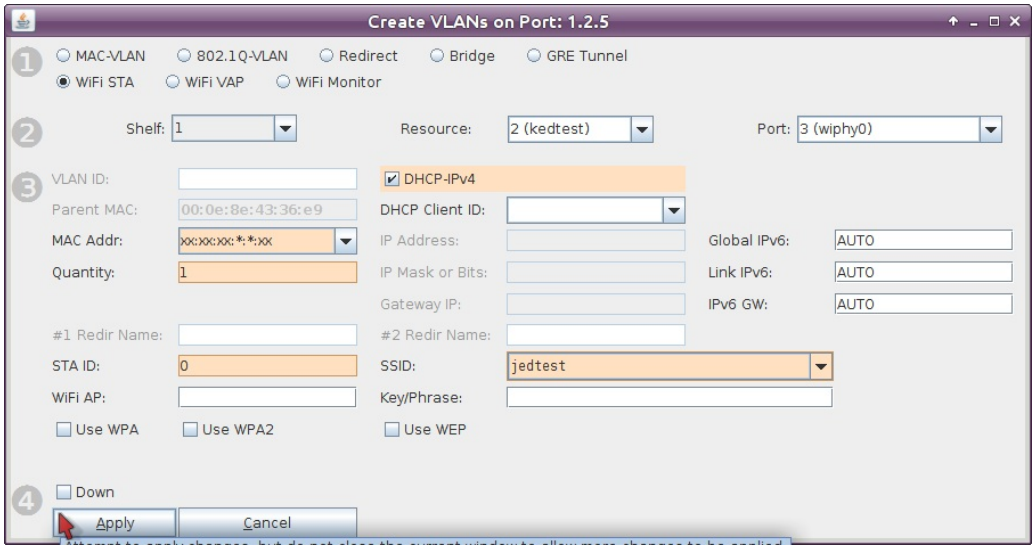




1. Create a WiFi station
   A. In the **Ports** tab, select wiphy0 and click **Create**



   B. In the **Create VLANS** window, craft one wifi station:



A. Select WiFi STA

B. For MAC address, choose `xx:xx:xx:*:*:xx`

C. Select DHCP-IPv4

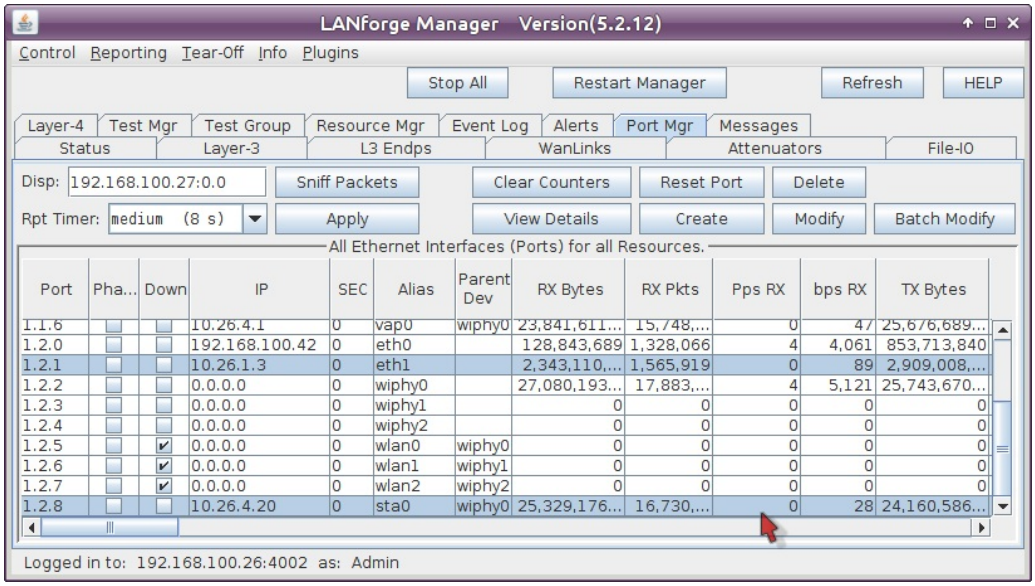
D. Enter Quantity **1**

E. Specify **0** for STA ID

F. The example SSID for this cookbook is `jedtest`

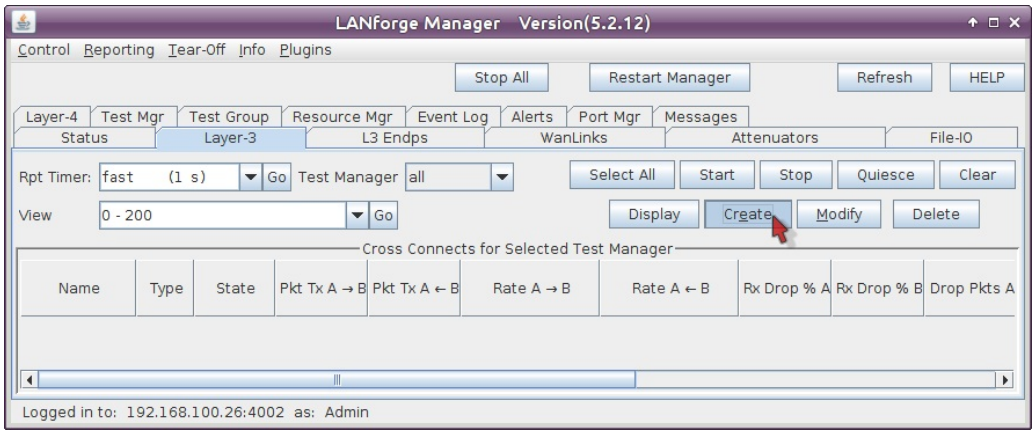
G. ...and then click **Apply**

C. You will see a station created:

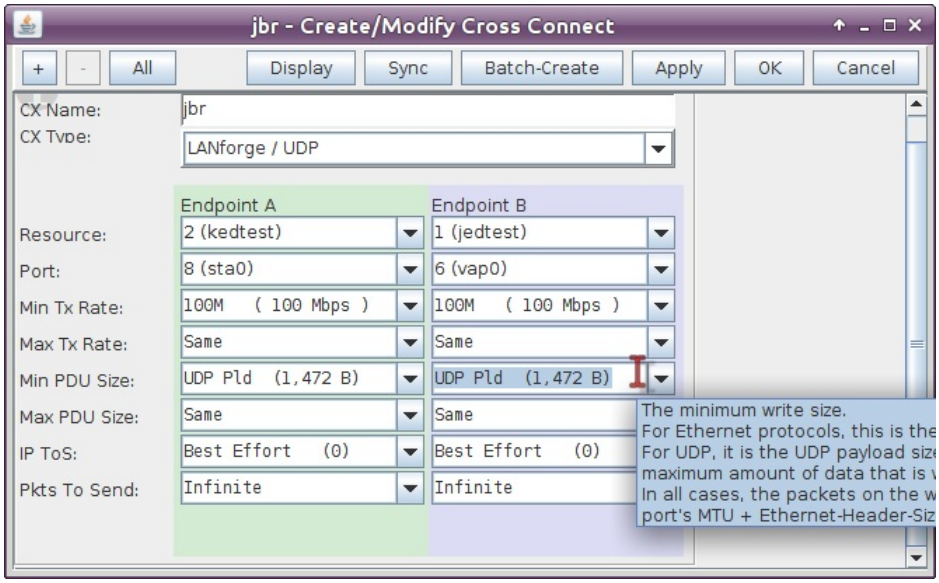


2. Create a connection to the Station

A. In the **Layer-3** tab, click **Create**



B. Create two-way station traffic



A. This example connection is named jbr

B. Connection Type is **LANforge / UDP**

C. This example resource is **kedtest**, where our stations live

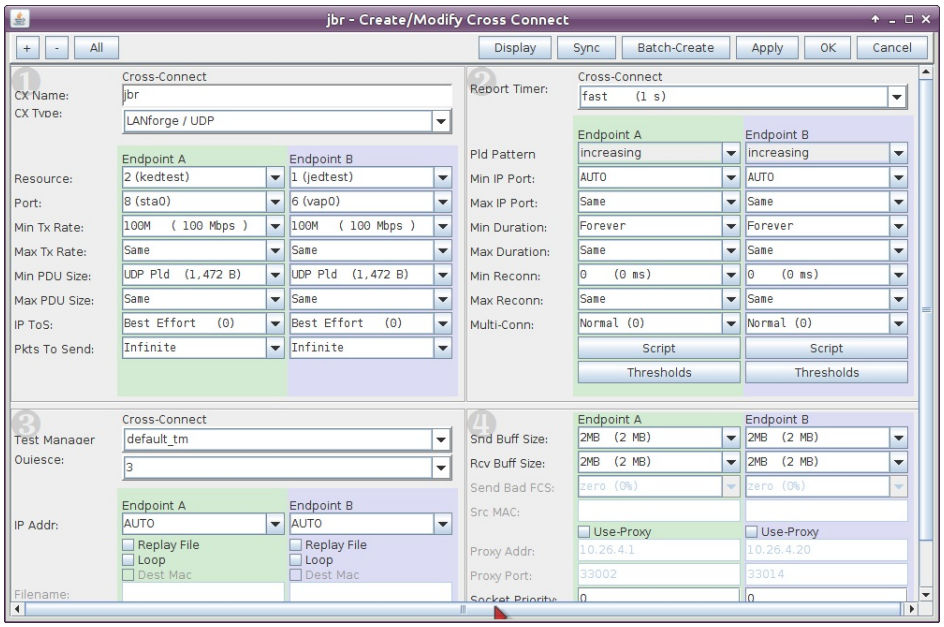
D. The Endpoint A Port will be the station **sta0**,

E. and the Endpoint B Port will be upstream of the ap, **eth1**.

F. We'll set the Min Tx Rate for both sides to **100 Mbps**

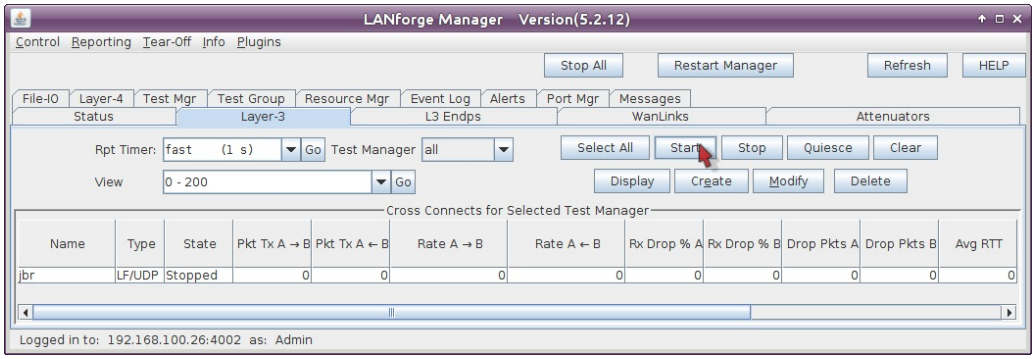
G. and set the PDU Size to `UDP Pld (1,472 B)`.

H. Use the **+** button to expand the window to panel 4 and add **2MB** of buffers to the connection:

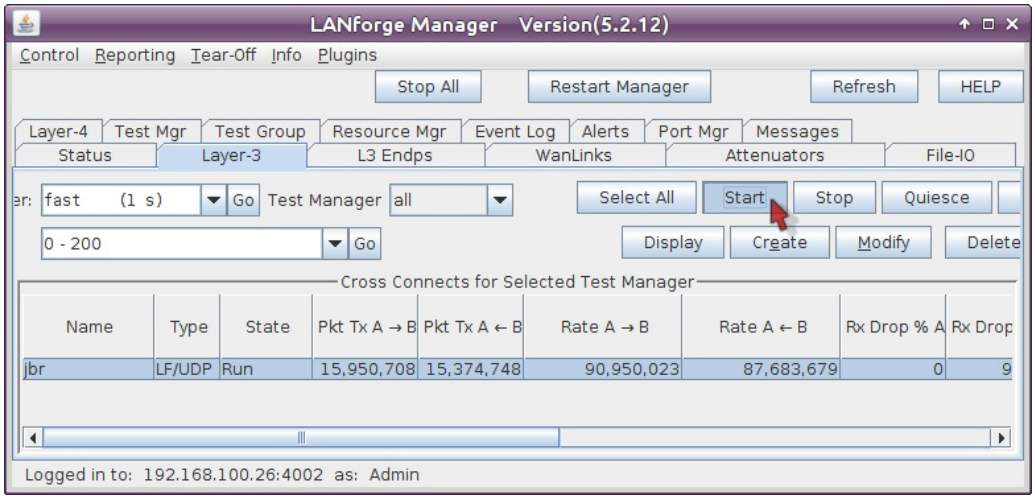


I. ...then click **OK**

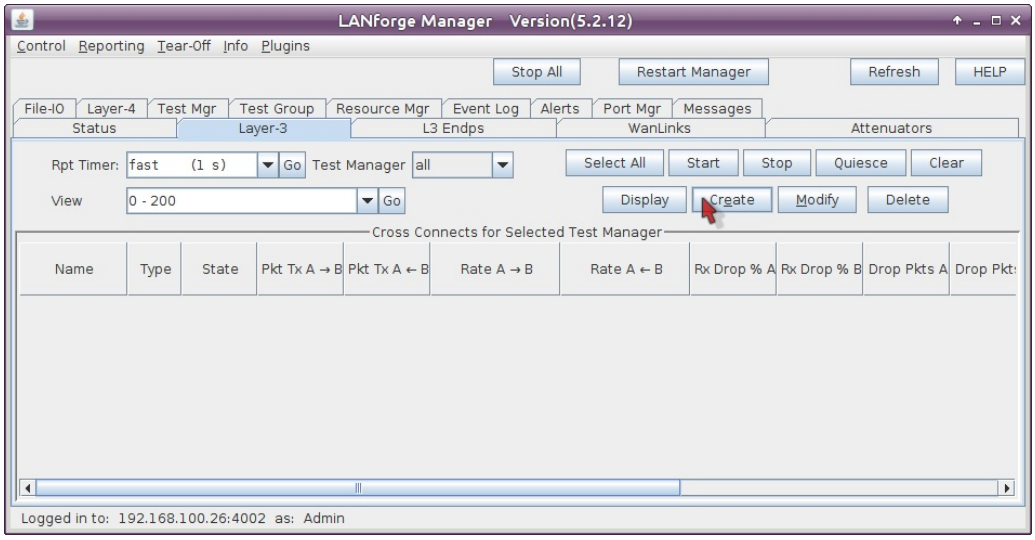
C. You will see connection jbr in the Layer-3 tab now:



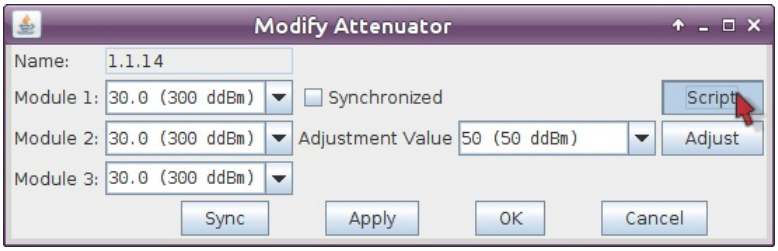
D. Begin traffic on this station by selecting it and clicking **Start**



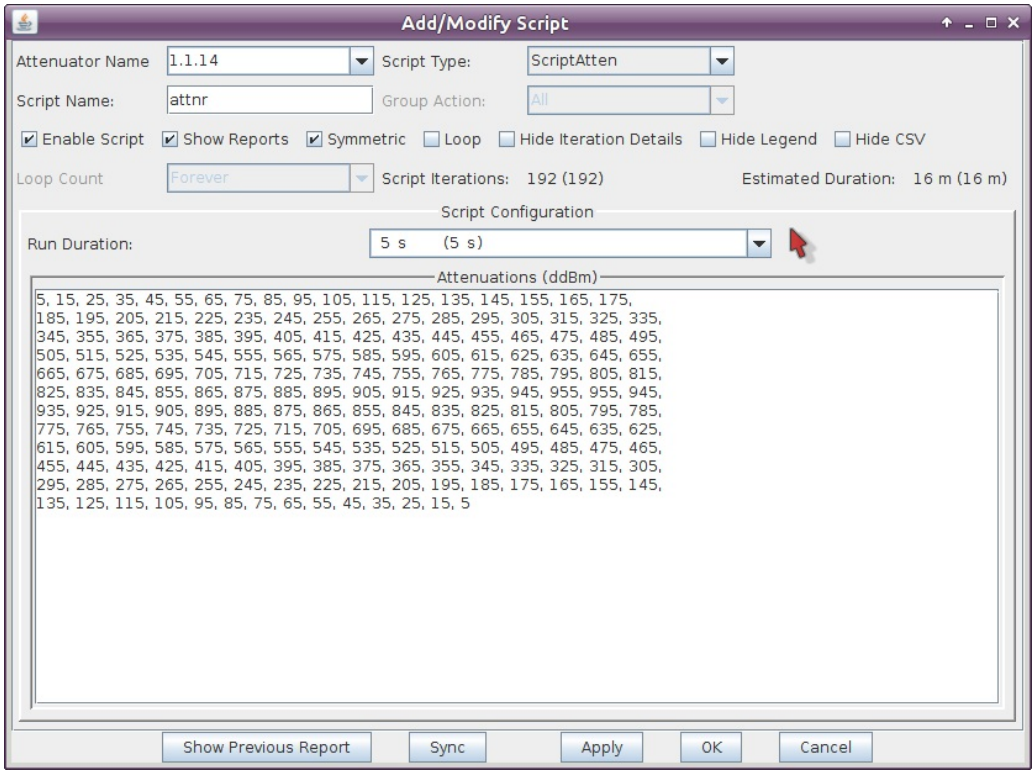
3. Create an Attenuator Script
   A. In the **Attenuators** tab, select your attenuator and click **Modify**



   B. You will see the Modify Attenuator window. Click on the **Script** button.



   C. The Add/Modify Script window opens. In the picture below you see a huge list of numbers (the attenuation levels). These numbers are not pre-populated. You can copy and paste them out of this document or create a series with other commands listed below.



A. In the Script Type pulldown, select **ScriptAtten**

B. Type in the name for the script, this example is called `attnr`

C. Select Symmetric

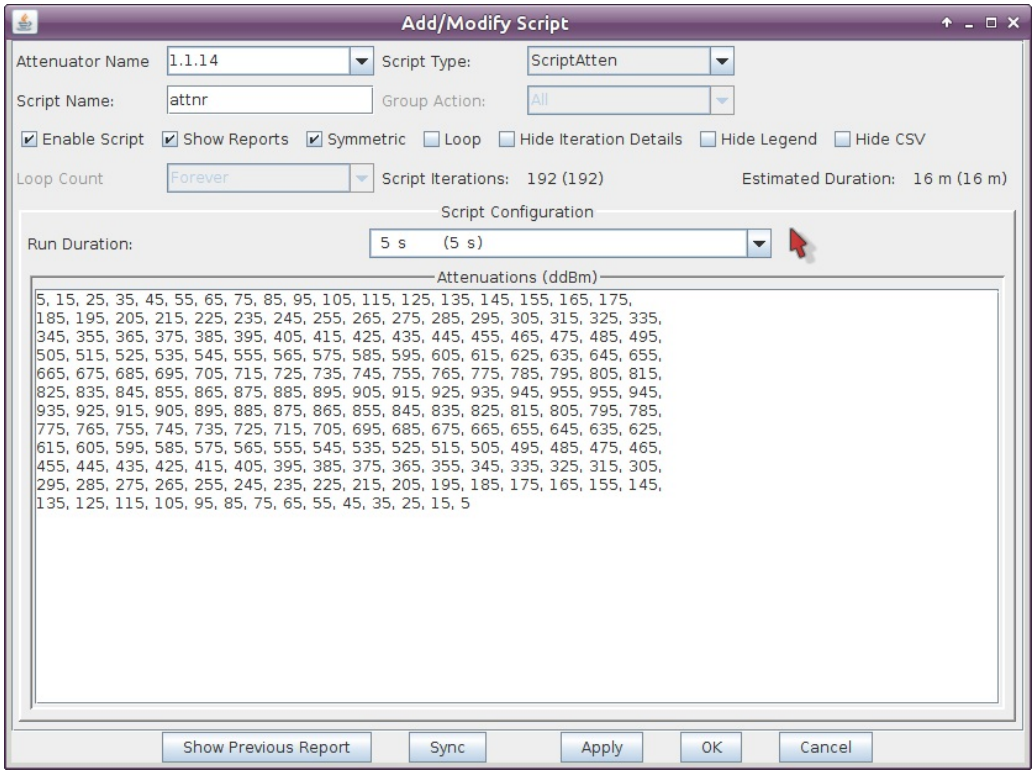
D. Choose **5 s** for Run Duration. This will run the Attenuator at each ddB value for this period of time.

E. Enter the following attenuation values for a 16 minute long test. This will send the attenuator from 5 to 955ddB and back:

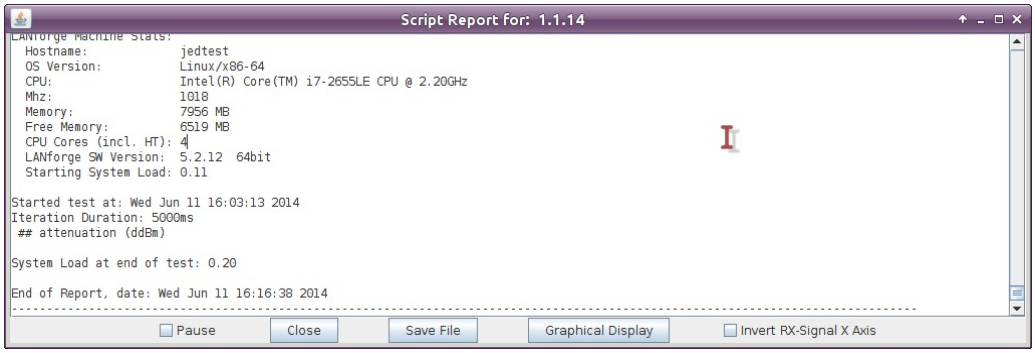
F.
```
5, 15, 25, 35, 45, 55, 65, 75, 85, 95, 105, 115, 125, 135, 145, 155, 165, 175,
185, 195, 205, 215, 225, 235, 245, 255, 265, 275, 285, 295, 305, 315, 325, 335,
345, 355, 365, 375, 385, 395, 405, 415, 425, 435, 445, 455, 465, 475, 485, 495,
505, 515, 525, 535, 545, 555, 565, 575, 585, 595, 605, 615, 625, 635, 645, 655,
665, 675, 685, 695, 705, 715, 725, 735, 745, 755, 765, 775, 785, 795, 805, 815,
825, 835, 845, 855, 865, 875, 885, 895, 905, 915, 925, 935, 945, 955, 955, 945,
935, 925, 915, 905, 895, 885, 875, 865, 855, 845, 835, 825, 815, 805, 795, 785,
775, 765, 755, 745, 735, 725, 715, 705, 695, 685, 675, 665, 655, 645, 635, 625,
615, 605, 595, 585, 575, 565, 555, 545, 535, 525, 515, 505, 495, 485, 475, 465,
455, 445, 435, 425, 415, 405, 395, 385, 375, 365, 355, 345, 335, 325, 315, 305,
295, 285, 275, 265, 255, 245, 235, 225, 215, 205, 195, 185, 175, 165, 155, 145,
135, 125, 115, 105, 95, 85, 75, 65, 55, 45, 35, 25, 15, 5
```

G. ...click **OK**

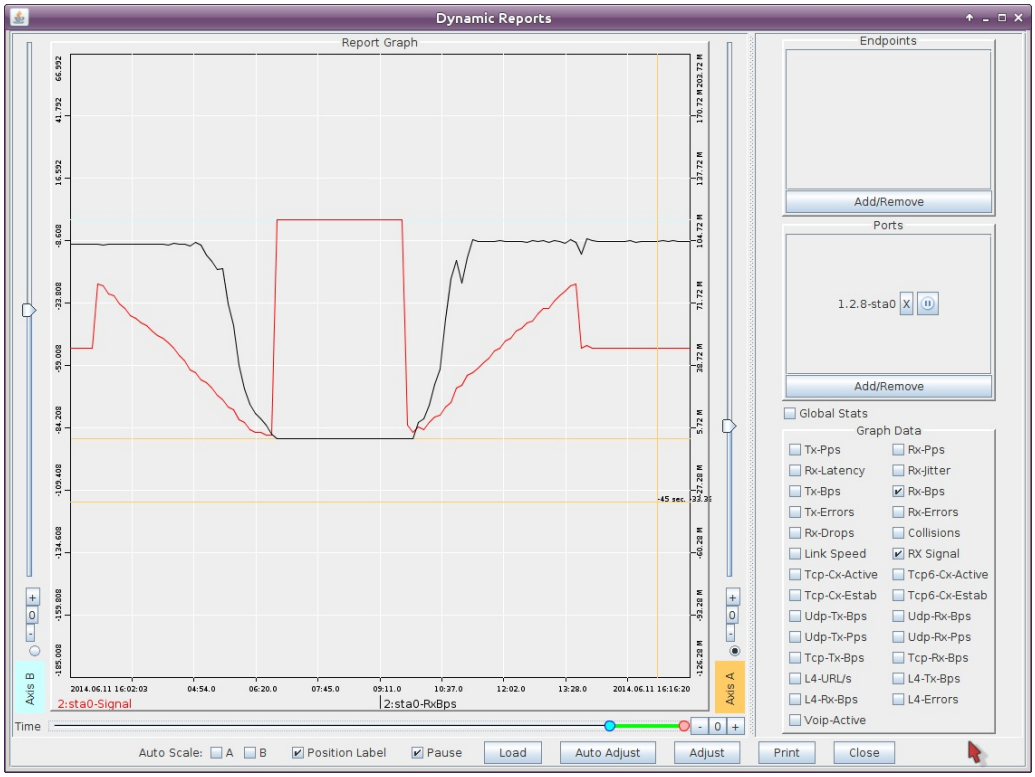
D. In the Attenuators tab, you will notice that your attenuator now reads **Enabled** in the Script column. Select the attenuator and click the **Start** button.



E. The window Script Report will appear. This monitors the script behavior of the attenuator script.



F. To monitor the progress of traffic and signal as it progresses, you will go to the Ports tab. Click on **sta0**, right click and select Dynamic Display. The Dynamic Reports window will open. Choose the following selections to refine the display:



A. Unselect Tx-Bps

B. Select Rx-Bps

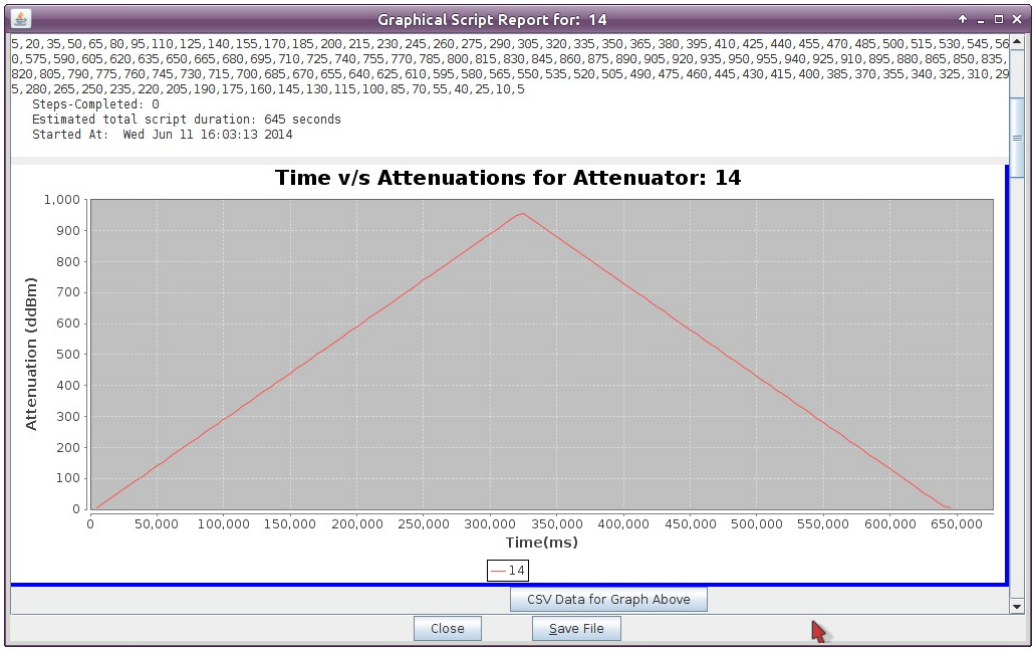
C. Select Rx-Signal

D. Drag the label **sta0-signal** to the left side of the X axis

E. Click **Adjust** and set Maximum Time to **30 min**, click **OK**

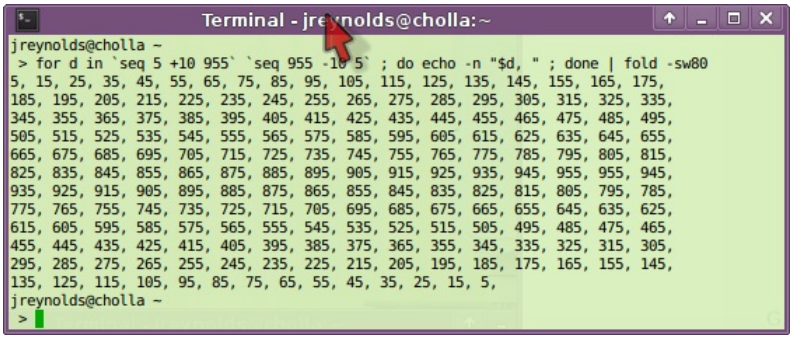
F. Click **Auto Adjust**

G. At the end of the attenuator script run, the Layer-3 connection will still be running, but the Script Report window will say `End of Report`. At this time, click on **Graphical Display**. You will see a graph of the attenuation level over time.



4. Creating attenuation sequences

5. It is relatively simple to generate a sequence of numbers right from a Terminal window (on Linux). Below are some examples:



A. The 10 ddB step series we used in this example:
```
for d in `seq 5 +10 955` `seq 955 -10 5` ; do echo -n "$d, " ; done | fold -sw80
```

B. A 5 ddB step series, as precise as the CT703 can run:
```
for d in `seq 0 +5 955` `seq 955 -5 0` ; do echo -n "$d, " ; done | fold -sw80
```

C. A 15 ddB step series from full attenuation to 25 ddB:
```
for d in `seq 955 -15 25` ; do echo -n "$d, " ; done | fold -sw80
```

D. A sawtooth ranging from 950 to 0 ddB:
```
i=0; while [ $i -lt 100 ]; do echo -n $(( $i%11 * 95))", "; i=$[ $i+1 ]; done | fold -sw80
```