Net-Tracker:

Software Overview

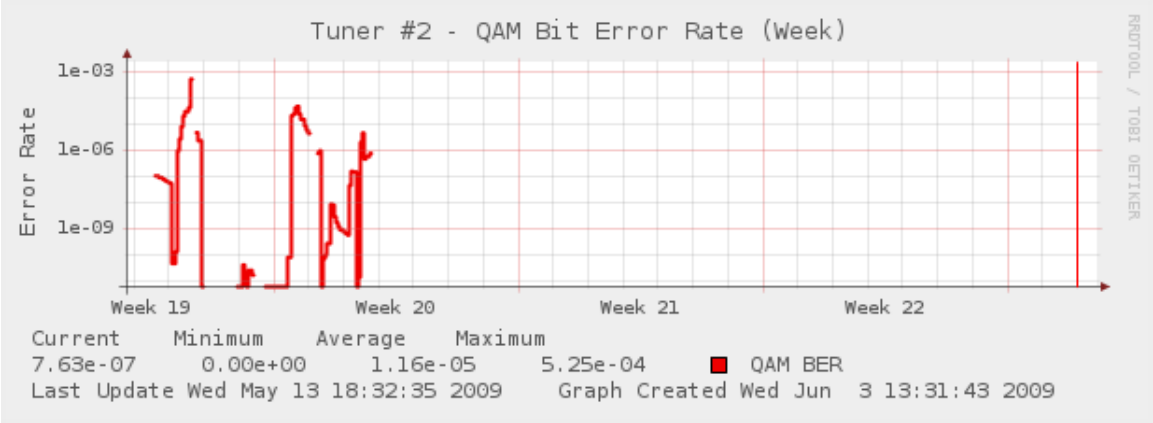
Net-Tracker is a Cable Modem, MTA and Digital Cable Box monitoring tool developed with the unique requirements of the Cable Network Analyst in mind. It allows the user to put customer and neighboring account equipment into monitoring and provides tracking of **Cable Box Signal Levels**, **QAM Signal Levels**, **QAM BER**, **QAM Frequency**, **QAM Codeword Errors** and **QAM Percent Codeword Errors**. For Modems and MTA's, it tracks **Ping Times**, **Signal Levels**, **Data Throughput**, **Micro-Reflections**, **Codeword Errors** and **Percent Codeword Errors**.

Any piece of equipment can easily be added provided you have MAC and IP Addresses for the device. Once added, Net Tracker will begin polling data. Polling intervals are currently set at five minutes for cable boxes and one minute for modems and MTA's

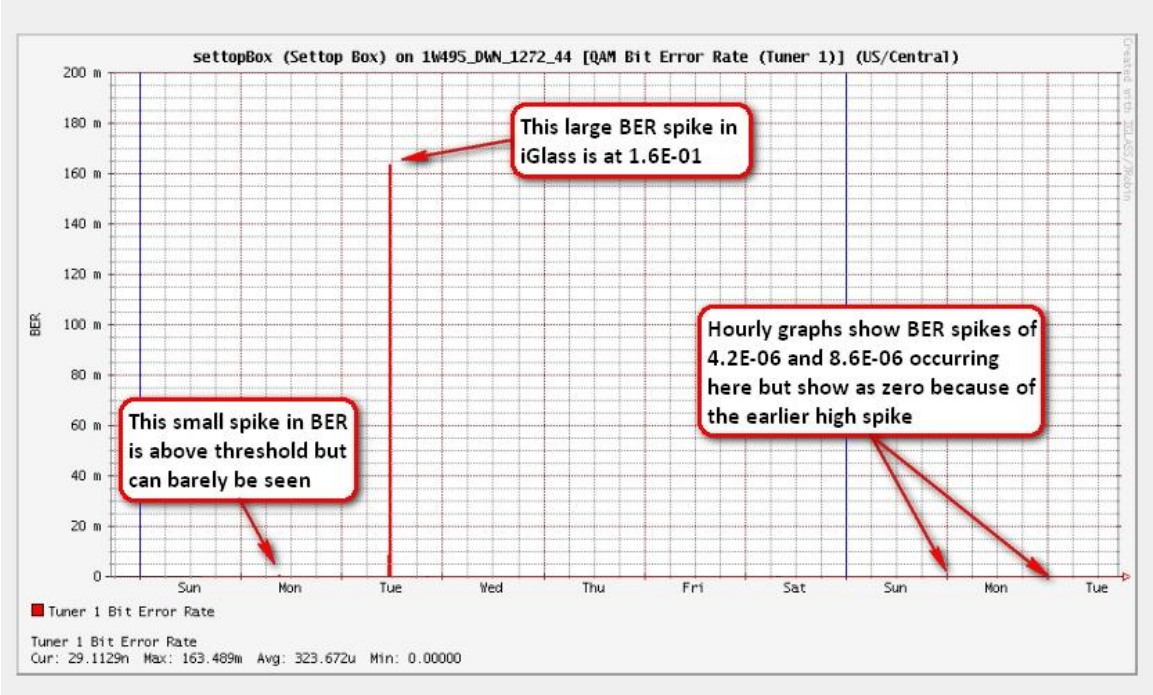
Net Tracker allows you to place any customer equipment into monitoring as well as place equipment on neighboring accounts into monitoring under the problem customer's Net-Tracker account. The key importance of this is that we are then able to put strategically situated equipment located throughout the node or segment being investigated into the tool and then compare the graphed parameters for this equipment on a single page. In this way, a user is able to compare on a single page, for example, BER of all customer Cable Boxes to the BER of Cable Boxes on neighboring accounts. Other tools force you to set up monitoring on each individual device and do not group them under one account. To compare the devices, you must manually pull up each device and insert each graph into a master Word document. Therefore what takes twenty minutes or longer to do in other tools takes only seconds in Net-Tracker.

Another key feature of Net-Tracker over other tools is the ability to view BER and CER graphs in scientific notation as opposed to decimal. Therefore when reading BER graphs, we are looking at values that are displayed in the cable industry standard notation. For example, Net-Tracker will show a bad BER reading as 3.4E-06 instead of as 3.4*u* like other tools such as iGlass do.

Just as powerful, Net-Tracker displays BER and CER graphs on a logarithmic scale instead of on a linear scale. The importance of this is that while other tools will show only one or two high peaks in errors on a graph and then nothing else, Net-Tracker will compress the scaling on the graph to not only show these high major spikes but also the smaller minor spikes. This is because with a linear data plot on a graph, lower spikes get scaled down to zero or near zero; thus not allowing us to use these smaller spikes when matching up graph patterns. The following is a sample BER graph from Net-Tracker:



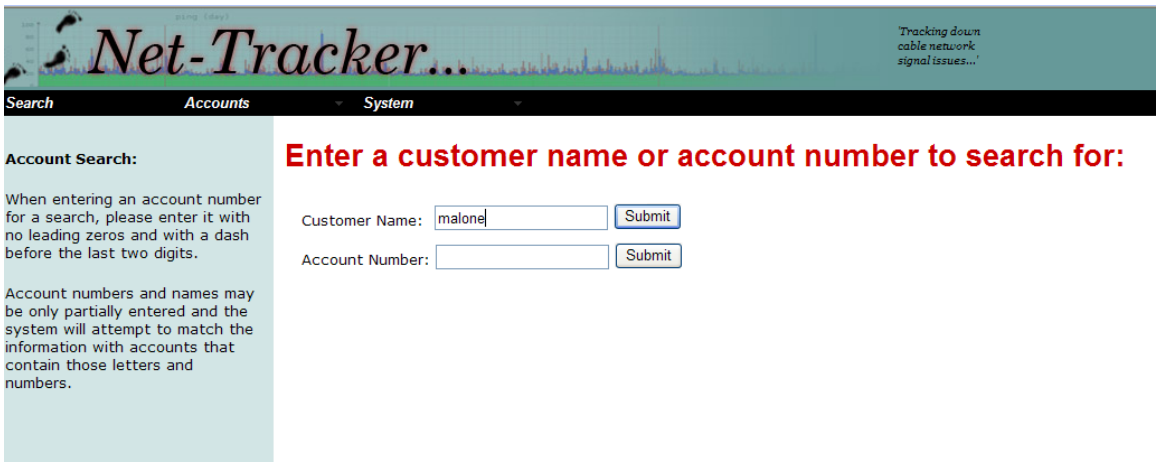
In the above graph, we can see several spikes in BER with the major one being at a maximum of 5.24E-04 and smaller ones down around 1.0E-05, 1.0E-06 and 1.0E-07. With the Net-Tracker graphs we see all these lower spikes displayed in the graph. On a linear graph such as that in iGlass or ServAssure, the higher spike would scale up to the top of the graph and the lower spikes would either be very small bumps or would not even register on the graph. Here is an example of this type of graph:



Because of the logarithmic graphs used in Net-Tracker, it is far easier to spot patterns of BER and CER than in any other tool.

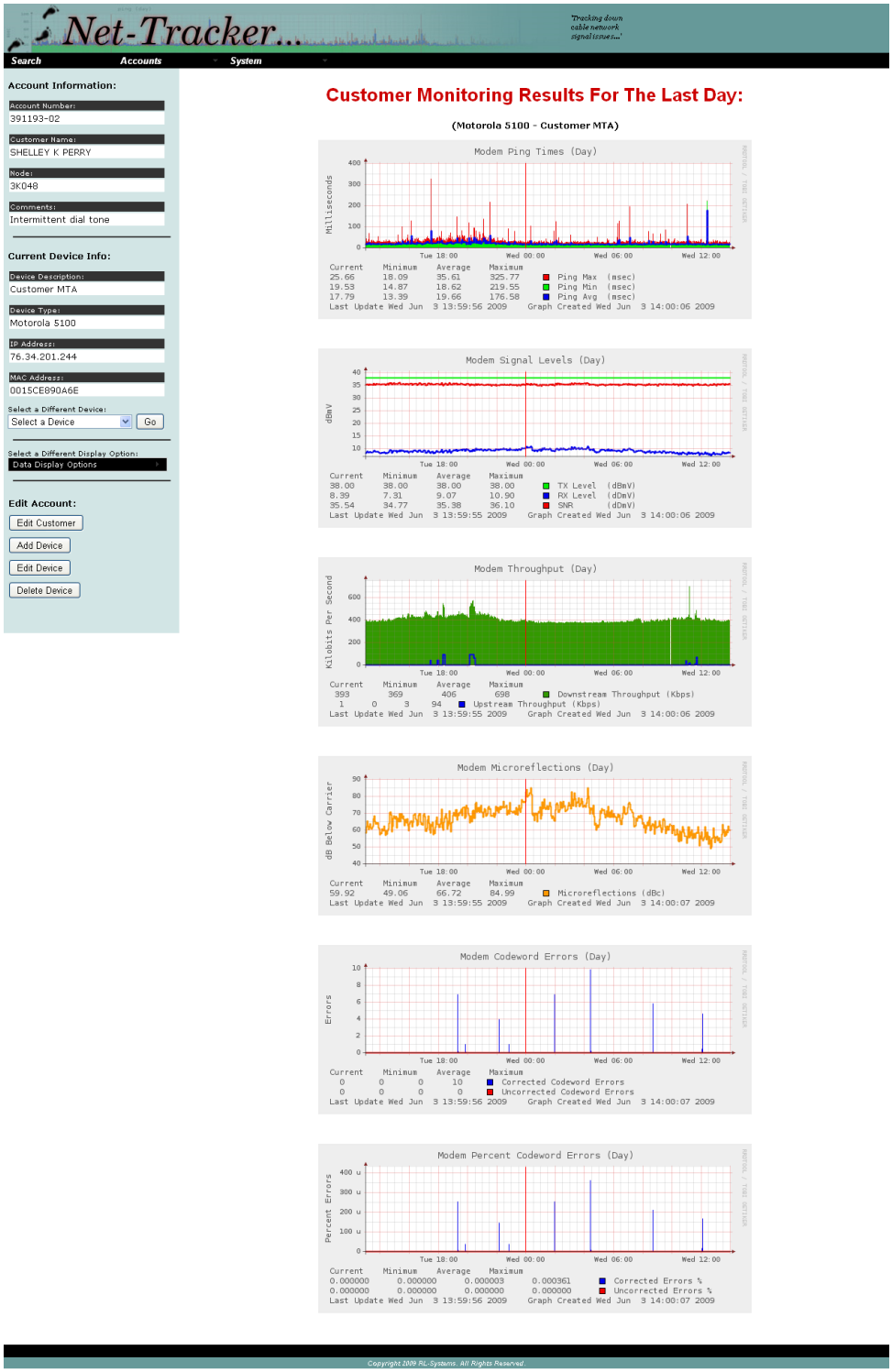
Net-Tracker Use:

Use of Net-Tracker is very easy and user friendly. To pull up a customer's monitoring account, you can search by customer name or account number:

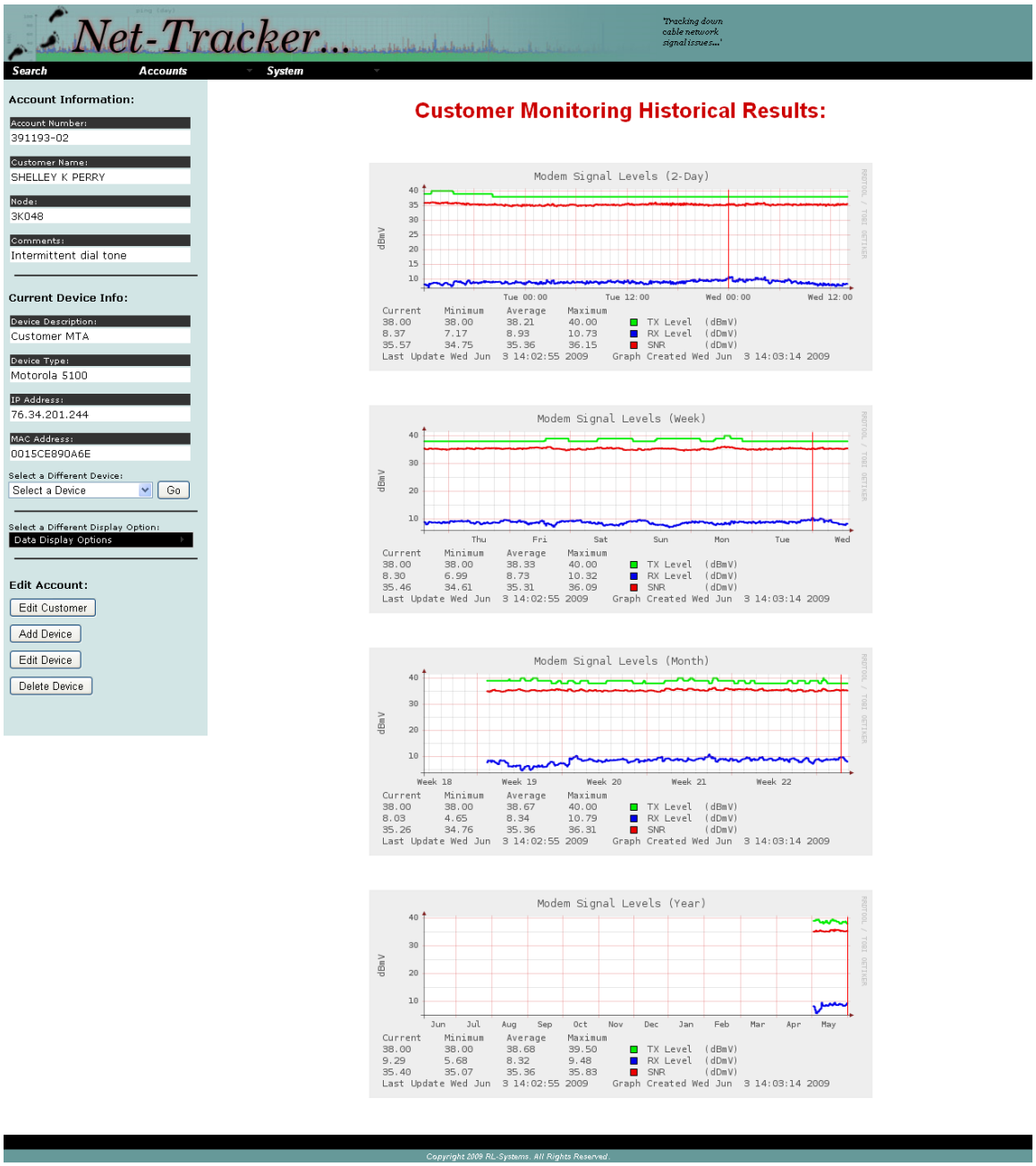


In addition to these fields, Net-Tracker has a large notes field for each customer account and also an additional notes fields for each device entered. This allows the user to put in detailed information as to not only what the customer issue is but also give specifics on each device entered. This is useful in detailing the neighboring customer name, account number and where in the node the other account is in relation to the subject account (i.e. upstream before active A06).

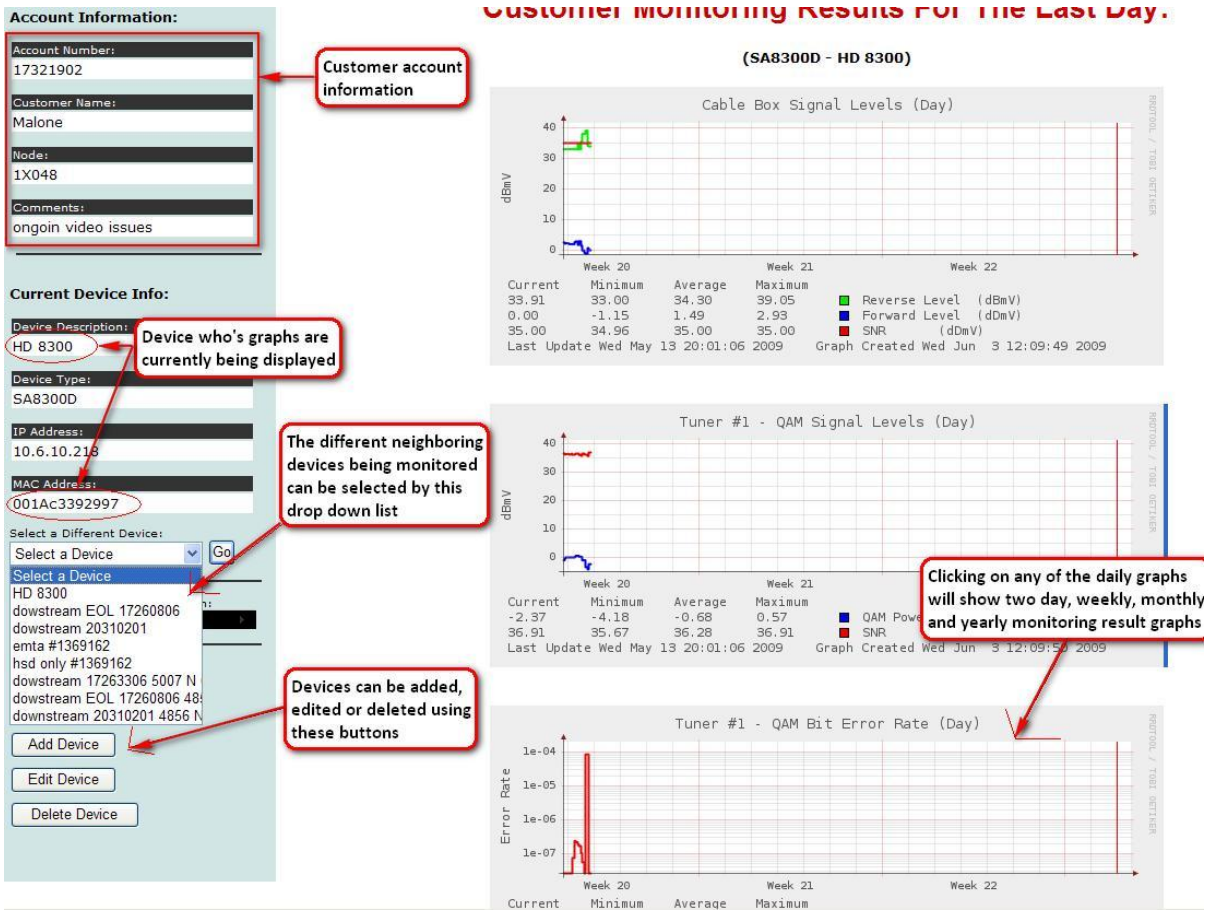
Once the customer or account number search is completed, it will bring up the first piece of equipment that was placed into monitoring and display the daily monitoring graphs:



By clicking on any of the daily graphs, it will bring up historical graphs for that data. These additional graphs show two-day, weekly, monthly and yearly monitoring results:

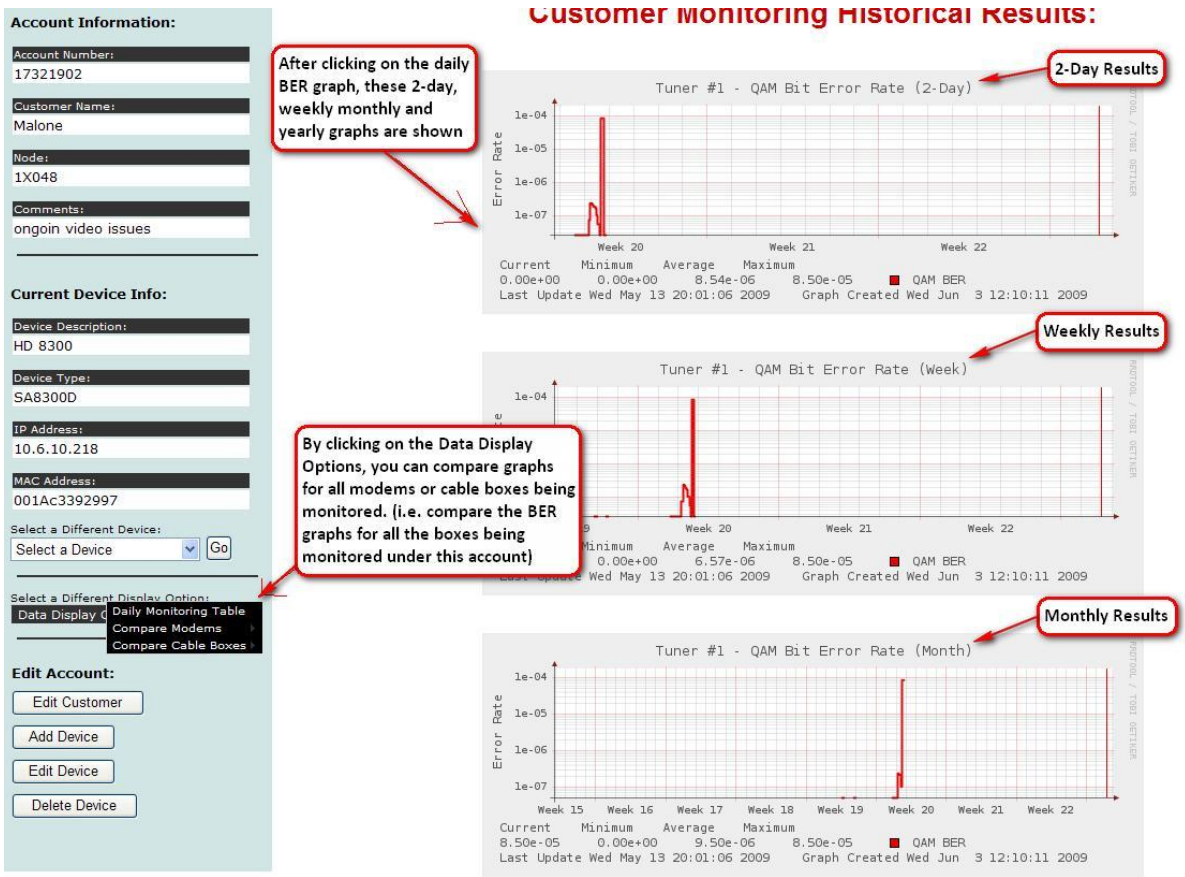


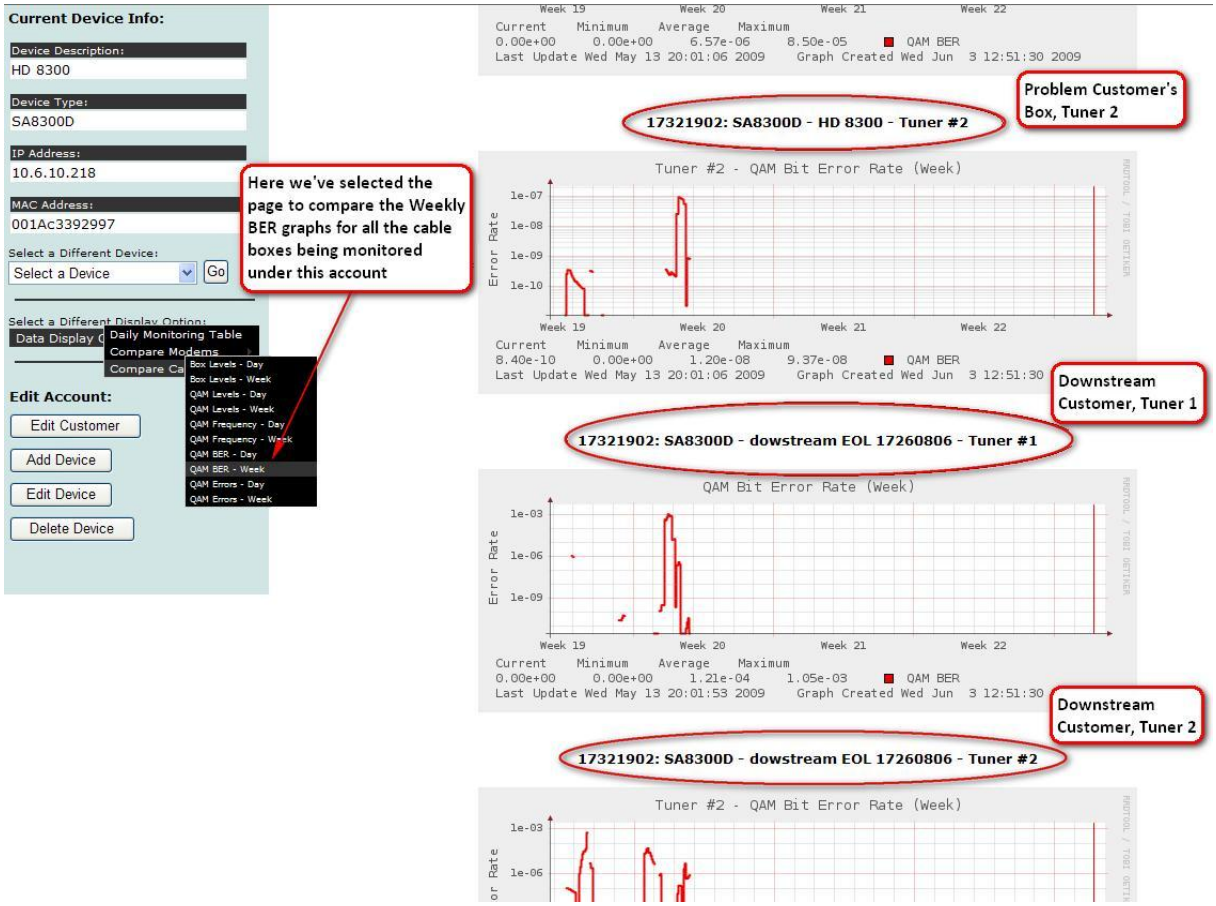
All the equipment being monitored under this customer account (whether the actual customer's equipment or that of a neighboring account) is located in a drop down list which allows you to select a specific box or modem to look at monitoring graphs for:

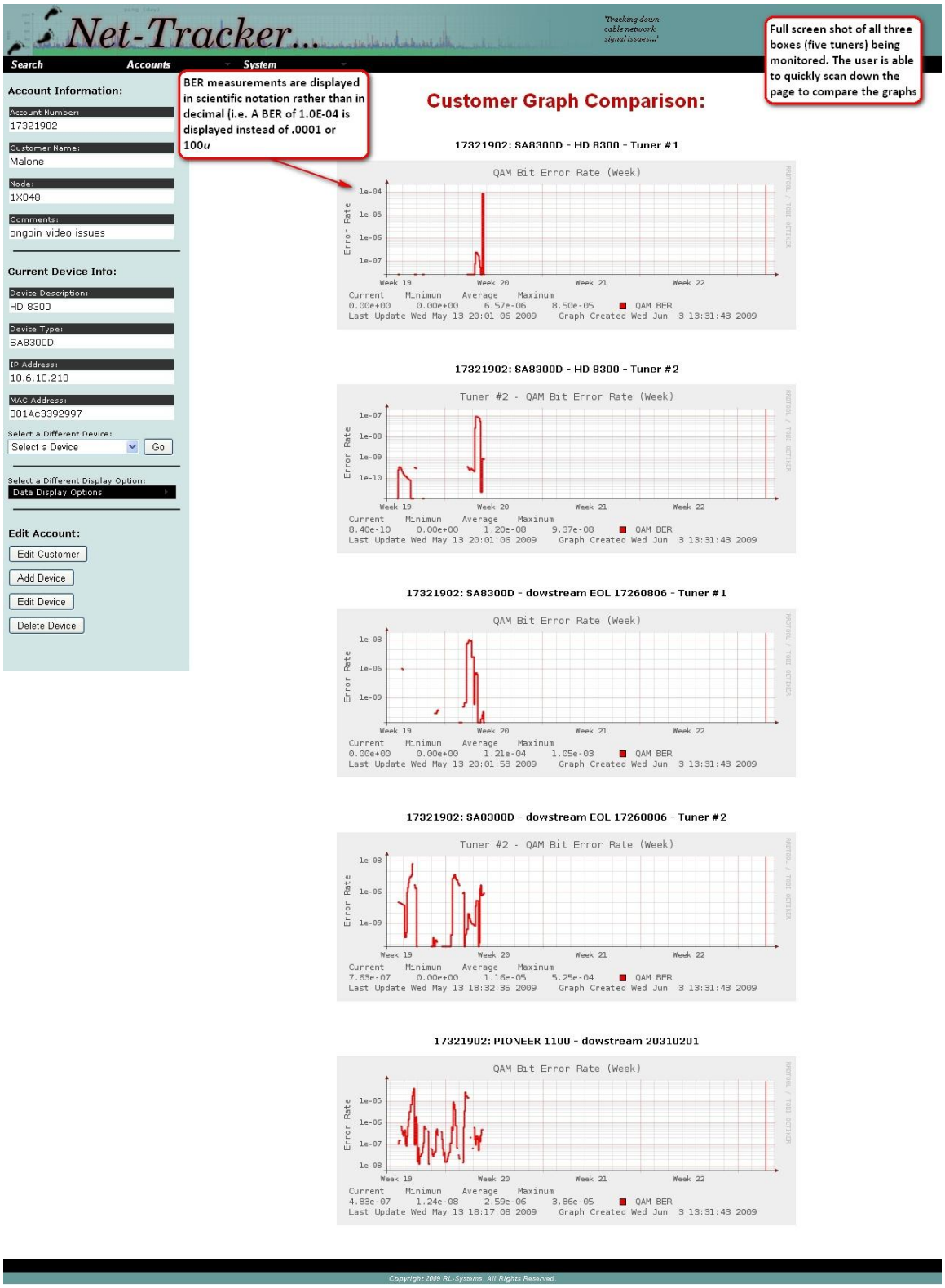


Data Display Options:

By clicking on data display options you can bring up graphs comparing all customer devices and neighboring account devices which have been grouped under the single Net-Tracker account. You can compare **Box Signal Levels**, **QAM Signal Levels**, **QAM Frequency**, **QAM BER** and **QAM Uncorrected Errors** for all equipment in monitoring under the single subject account. Daily or weekly graphs can be selected for the comparison of these parameters. For modems and MTA's, you can compare **Ping Times**, **Signal Levels**, **Percent Errors**, **TX Levels** and **RX Levels** for the day or week.




Current Device Info:
Device Description:
HD 8300
Device Type:
SA8300D
IP Address:
10.6.10.218
MAC Address:
001Ac3392997
Select a Different Device:
Select a Device
Go
Select a Different Display Option:
Data Display
Daily Monitoring Table
Compare Modems
Compare Ca
Box Levels - Day
Box Levels - Week
QAM Levels - Day
QAM Levels - Week
QAM Frequency - Day
QAM Frequency - Week
QAM BER - Day
QAM BER - Week
QAM Errors - Day
QAM Errors - Week
Edit Account:
Edit Customer
Add Device
Edit Device
Delete Device
Here we've selected the page to compare the Weekly BER graphs for all the cable boxes being monitored under this account
Week 19 Week 20 Week 21 Week 22
Current Minimum Average Maximum
0.00e+00 0.00e+00 6.57e-06 8.50e-05 QAM BER
Last Update Wed May 13 20:01:06 2009 Graph Created Wed Jun 3 12:51:30 2009
17321902: SA8300D - HD 8300 - Tuner #2
Problem Customer's Box, Tuner 2
Tuner #2 - QAM Bit Error Rate (Week)
Error Rate
1e-07
1e-08
1e-09
1e-10
Week 19 Week 20 Week 21 Week 22
Current Minimum Average Maximum
8.40e-10 0.00e+00 1.20e-08 9.37e-08 QAM BER
Last Update Wed May 13 20:01:06 2009 Graph Created Wed Jun 3 12:51:30
Downstream Customer, Tuner 1
17321902: SA8300D - dowstream EOL 17260806 - Tuner #1
QAM Bit Error Rate (Week)
Error Rate
1e-03
1e-06
1e-09
Week 19 Week 20 Week 21 Week 22
Current Minimum Average Maximum
0.00e+00 0.00e+00 1.21e-04 1.05e-03 QAM BER
Last Update Wed May 13 20:01:53 2009 Graph Created Wed Jun 3 12:51:30
Downstream Customer, Tuner 2
17321902: SA8300D - dowstream EOL 17260806 - Tuner #2
Tuner #2 - QAM Bit Error Rate (Week)
1e-03
1e-06


Net-Tracker...
'Tracking down cable network signal issues...'
Search
Accounts
System
Account Information:
Account Number:
17321902
Customer Name:
Malone
Node:
1X048
Comments:
ongoin video issues
Current Device Info:
Device Description:
HD 8300
Device Type:
SA8300D
IP Address:
10.6.10.218
MAC Address:
001Ac3392997
Select a Different Device:
Select a Device
Go
Select a Different Display Option:
Data Display Options
Edit Account:
Edit Customer
Add Device
Edit Device
Delete Device
BER measurements are displayed in scientific notation rather than in decimal (i.e. A BER of 1.0E-04 is displayed instead of .0001 or 100u
Full screen shot of all three boxes (five tuners) being monitored. The user is able to quickly scan down the page to compare the graphs
Customer Graph Comparison:
17321902: SA8300D - HD 8300 - Tuner #1
QAM Bit Error Rate (Week)
Error Rate
1e-04
1e-05
1e-06
1e-07
Week 19
Week 20
Week 21
Week 22
Current Minimum Average Maximum
0.00e+00 0.00e+00 6.57e-06 8.50e-05 QAM BER
Last Update Wed May 13 20:01:06 2009 Graph Created Wed Jun 3 13:31:43 2009
17321902: SA8300D - HD 8300 - Tuner #2
Tuner #2 - QAM Bit Error Rate (Week)
Error Rate
1e-07
1e-08
1e-09
1e-10
Week 19
Week 20
Week 21
Week 22
Current Minimum Average Maximum
8.40e-10 0.00e+00 1.20e-08 9.37e-08 QAM BER
Last Update Wed May 13 20:01:06 2009 Graph Created Wed Jun 3 13:31:43 2009
17321902: SA8300D - dowstream EOL 17260806 - Tuner #1
QAM Bit Error Rate (Week)
Error Rate
1e-03
1e-06
1e-09
Week 19
Week 20
Week 21
Week 22
Current Minimum Average Maximum
0.00e+00 0.00e+00 1.21e-04 1.05e-03 QAM BER
Last Update Wed May 13 20:01:53 2009 Graph Created Wed Jun 3 13:31:43 2009
17321902: SA8300D - dowstream EOL 17260806 - Tuner #2
Tuner #2 - QAM Bit Error Rate (Week)
Error Rate
1e-03
1e-06
1e-09
Week 19
Week 20
Week 21
Week 22
Current Minimum Average Maximum
7.63e-07 0.00e+00 1.16e-05 5.25e-04 QAM BER
Last Update Wed May 13 18:32:35 2009 Graph Created Wed Jun 3 13:31:43 2009
17321902: PIONEER 1100 - dowstream 20310201
QAM Bit Error Rate (Week)
Error Rate
1e-05
1e-06
1e-07
1e-08
Week 19
Week 20
Week 21
Week 22
Current Minimum Average Maximum
4.83e-07 1.24e-08 2.59e-06 3.86e-05 QAM BER
Last Update Wed May 13 18:17:08 2009 Graph Created Wed Jun 3 13:31:43 2009
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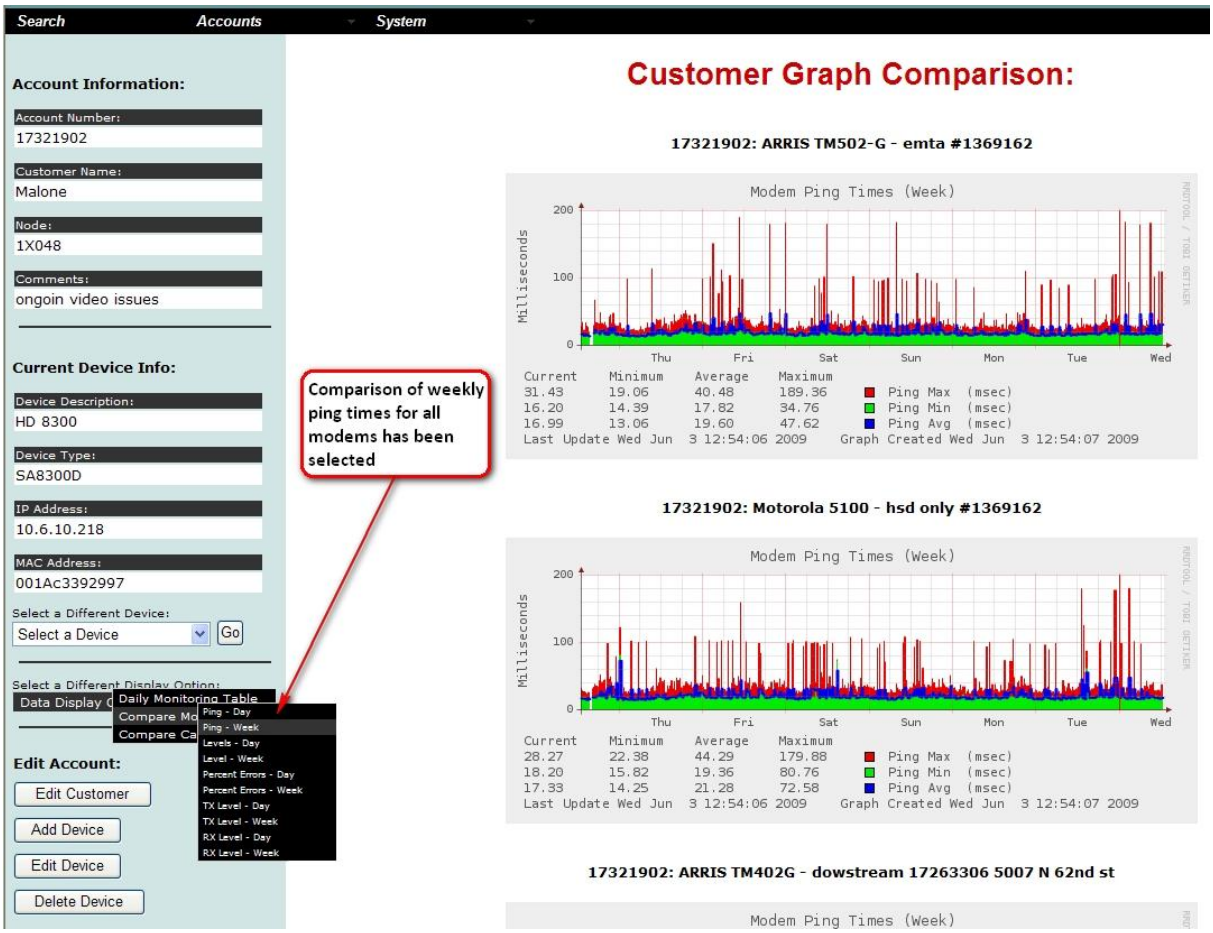

Above are just some of the highlights of Net-Tracker but these features don't speak to its most powerful advantage over other tools: zero cost to develop and implement. Net-Tracker was developed at no cost to Time Warner Cable and was implemented on old, obsolete hardware which the company was no longer using.

Net-Tracker provides an enormous time savings for the analyst over the standard monitoring software used on modems. With ServAssure, each device needs to be pulled up individually then the graphs pasted into a Word document for comparison to determine where in the cable network the issue began. This can take twenty minutes or more, depending on the number of devices being monitored. With Net-Tracker, this comparison is shown on a single screen and takes only seconds.

Another advantage of the program is the ability to add new features we need quickly because code is controlled internally. While many other features can be added, some future developments include email notification when equipment goes beyond threshold and a daily summary report for each account a Tier 3 Analyst is working on.