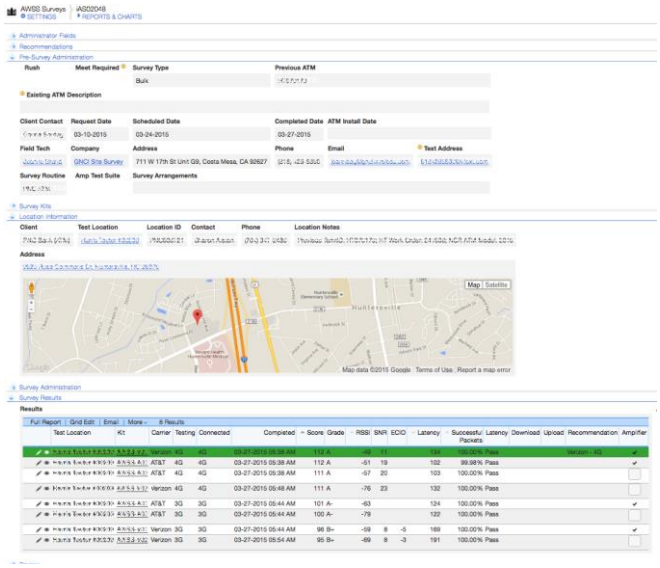
Automated Wireless Support System

Global Net Commerce, Inc.

Secure In Wireless * Solid In Solutions



AWSS: Site Survey

AWSS: Site Survey is GNCI's automated Wireless WAN site testing system. It's part of the AWSS suite of services designed to ease management, maintenance and support of your WWAN connections. Survey testing measures both wireless and network performance metrics so that you know your site is production-ready.

Site Testing

Why not just use the signal bars on on my smartphone?

Congratulations! You've decided to take the next step in finding out whether Wireless WAN can help you more quickly and easily manage your connected resources in the field. But how do you know it will work? How do you know there is a wireless signal present; and that it's strong enough to maintain a persistent connection? Assuming it is, will the connection be fast enough and support my applications' network requirements such as latency, packet loss and throughput? The answer is to test it. Put a WWAN device at your location, take measurements and compare them to your requirements.

But couldn't that be figured out with a smartphone? Yes, and no. One could determine whether an appropriate WWAN signal (4G/LTE, 3G, etc.) is present at the location and get a rough idea of its strength. Measuring network performance is trickier; and results can be both inconsistent and provide a poor representation of how the connection will behave in production.

The table below describes the tests run for a Base survey:

Metric	Description	Duration	Result
Signal Strength	Received Signal Strength Indication (RSSI) measured in Decibel Millimeters (dBm) at one second intervals. Higher measurements are better.	10 Minutes	Letter Grade
Signal Quality	Signal Quality Indicator expressed as a percentage. Measured at one second intervals. Higher is better.	10 Minutes	
Interference	Signal to Noise Ratio (SNR and/or Ec/Io) compares signal strength to interference and is measured at one second intervals. Higher is better.	10 Minutes	
Packet Loss	The number of packets sent to a destination and returned to their source within a specific timeframe. Expressed as a. Higher is better.	2500 Packets	
Latency	The time it takes for data packets to reach their destination and return to the source. Measured ms (milliseconds). Lower is better.	2500 Packets	Pass/Fail

The results are laid out as such:

Results

Full Report | Grid Edit | Email | More 8 Results

Test Location	Kit	Carrier	Testing	Connected	Completed	Score	Grade	RSSI	SNR	ECIO	Latency	Successful Packets	Latency	Download	Upload	Recommendation	Amplifier
Harris Teeter #00209	AWSS-V01	Verizon	4G	4G	03-27-2015 05:38 AM	112	A	-49	11		134	100.00%	Pass			Verizon - 4G	✔
Harris Teeter #00209	AWSS-A01	AT&T	4G	4G	03-27-2015 05:38 AM	112	A	-51	19		102	99.98%	Pass				✔
Harris Teeter #00209	AWSS-A02	AT&T	4G	4G	03-27-2015 05:38 AM	111	A	-57	20		103	100.00%	Pass				
Harris Teeter #00209	AWSS-V02	Verizon	4G	4G	03-27-2015 05:48 AM	111	A	-76	23		132	100.00%	Pass				
Harris Teeter #00209	AWSS-A01	AT&T	3G	3G	03-27-2015 05:44 AM	101	A-	-63			124	100.00%	Pass				✔
Harris Teeter #00209	AWSS-A02	AT&T	3G	3G	03-27-2015 05:44 AM	100	A-	-79			122	100.00%	Pass				
Harris Teeter #00209	AWSS-V01	Verizon	3G	3G	03-27-2015 05:44 AM	96	B+	-59	8	-5	169	100.00%	Pass				✔
Harris Teeter #00209	AWSS-V02	Verizon	3G	3G	03-27-2015 05:54 AM	95	B+	-69	8	-3	191	100.00%	Pass				

The letter grade gives you an indication of the wireless performance; the Pass/Fail is determined by comparing the average latency to your applications' maximum latency thresholds. If the latency is within your applications' latency threshold and the letter grade is acceptable, the survey is Passes and is recommended for a wireless connection. This is done for two carriers and test with signal amplifiers can be added as an option. Throughput measurements, both upload and download, can also be added. When the survey is complete you will have a good idea of just how the WWAN connection will perform in production.

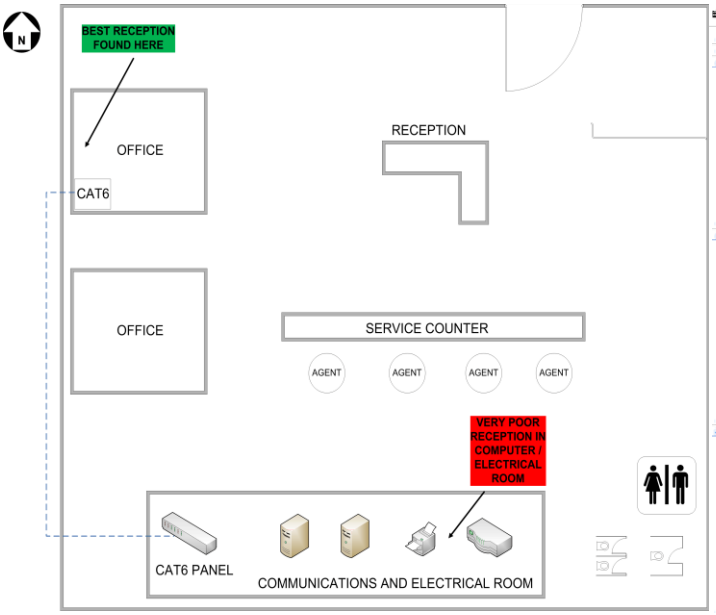
The Wireless WAN devices used to conduct Base Surveys support Verizon and AT&T. Tests can be run individually for different carrier networks as well. For instance, you can test both carriers on each of their respective 4G (LTE) and 3G networks. This can be important in the event the primary network becomes unavailable for any reason (think cell tower struck by lightning, cell tower maintenance, etc.). Our devices feature an integrated battery back up capable of maintaining the wireless connection for several hours in the event of a power failure (and will alert via SNMP trap when the unit changes from AC to battery power). While this may not sound critical when conducting a site survey, it does give you a good deal of flexibility. Surveys can be completed in a new location that may not have power service established. Alternate locations within the site can be easily tested without the inconvenience of be tethered to a short AC adapter or a long extension cord. The LEDs on the device act like signal bars on a mobile phone so you can get a rough idea where at the site might be best before starting the actual survey.

Survey Logistics

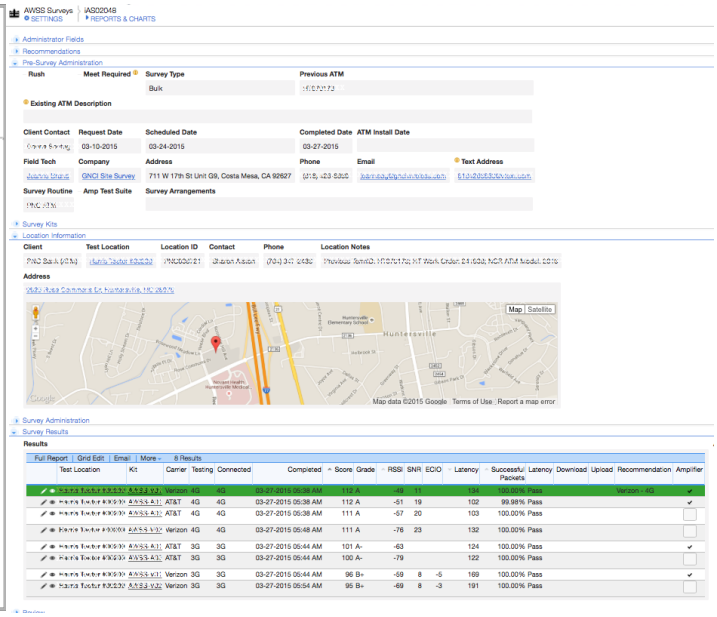
GNCI provides surveys in two ways: Base and Managed. Essentially the difference amounts to who does the work at the test site. For Base Surveys, GNCI will ship test devices to you or your representative and your people will conduct the survey. Managed Surveys are conducted by GNCI representatives. We will dispatch a field tech with the appropriate equipment and they will conduct the survey.

Base Surveys

Work at the site for AWSS Site Surveys is a snap. GNCI ships you the test devices with illustrated instructions. Plug in the test devices (if power is available – otherwise run off the battery) and call GNCI to kick off the survey. If you have some flexibility on where your WWAN device will be located when in production, walk around with the device to your various options and see which location within the site has the strongest signal. That's it. If you've given us your mobile number; our system will notify you when the survey is complete.



Best Reception Diagram



Completed AWSS Survey

Managed Surveys

Managed Surveys are the paradigm of convenience. Provide us with a list of locations you want surveyed, contacts and authorization to access those sites and we'll take care of the rest. Our survey planners will reach out to the contact at each site, give them a brief overview of what will happen during the survey and schedule a convenient time. Our field techs will reach out to your site contacts to confirm the appointment before arriving.

Survey Options

GNCI's Base survey tests two carriers (AT&T and Verizon) on one network (4G, 3G or 2G) with a standard antenna, as described in the table above. Latency and Packet Loss tests are run to locations publicly available on the internet. But let's say