# Agilent's new remote monitoring system solves wireless network

# Agilent's new remote monitoring system solves wireless network maintenance and optimization challenges

THE ROAD TO THE NEXT GENERATION WIRELESS NETWORK is filled with detours that stem not only from a downturn in the economy, but the challenges carriers face when building out and maintaining networks. But with more than 900 million wireless subscribers worldwide, the wireless evolution will continue, not only in voice but to include the Internet as well. A key component to insuring success is that services perform as promised.

Although analysts at RHK predict that the wireless evolution will be robust--commercial software spending is expected to increase to nearly \$25 billion by 2005; in-house software and systems integration to approximately \$21 billion by 2005--right now carriers are under increasing pressure to save time and money while improving network performance, increasing revenues and customer satisfaction. They are being asked to do more with less--operationally and financially. Yet these constraints are not stopping wireless service providers from building out new networks or enhancing existing ones. They're forcing them to become more creative.

"We're running into a situation where a lot of service providers are trying to grow their networks with current methods," said Eric McHenry, vice president and general manager of Agilent's Wireless Network Test Division. "But some of the current processes that service providers have are inefficient in terms of how they do their work."

Remote monitoring systems are designed to improve the processes wireless service providers have. Remote monitoring systems change the way network optimization and maintenance is performed by their ability to inspect network trouble spots and help determine the problem before scheduling a drive test or a truck roll. Carriers need to be more proactive in addressing network issues. The move toward next generation networks demands better optimization and maintenance methods.

Agilent Technologies' new remote monitoring system, which consists of the Base Station Remote Monitoring

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System (RMS) and the Air Interface Remote Monitoring System, allow carriers to be more proactive as they build out and maintain their networks. With an increasing amount of equipment to maintain, the ability to monitor network performance and detect problems before dispatching truck rolls and performing unnecessary drive tests is key to saving time and money.

The Agilent RMS also reduces costs associated with maintaining base stations and related air interface equipment by simplifying maintenance through remote troubleshooting. As wireless service providers adapt their networks to newer and better technologies, the new Agilent RMS gives early insight into network performance before carriers complete internal processes and procedures with manned solutions.

"Our solution can spot problems before they affect service," McHenry said. "Ultimately, it allows carriers to improve and maintain a high level of performance while reducing costs."

With the ability to continually monitor base stations and air interfaces remotely, problems can be detected more quickly, reducing the likelihood of disrupted service and increasing customer satisfaction.

The use of portable test equipment for base stations and drive test equipment for air interface performance to resolve difficult situations that need the human touch will not end. The RMS helps determine the best person and the correct type of equipment needed to rectify the situation. As wireless service providers grow their networks, increasing efficiencies via data collection and subsequent trend analysis becomes imperative when working with limited resources. The RMS provides 24-hour monitoring, which allows for more proactive detection of problems before they affect network service and, ultimately, customer satisfaction.

Agilent designs testing solutions that encompass the entire network. Their new remote monitoring solutions address base station and air interface issues in a wireless network and complement traditional maintenance and optimization equipment in use today.

#### BASE STATION REMOTE MONITORING SYSTEM

Agilent's Base Station RMS helps address a multitude of problems that wireless service providers face today, including the need to expand networks and deploy next generation technologies and services without increasing personnel expenses and detecting and resolving network problems before service is affected. The Base Station RMS continuously monitors various network performance measurements and alerts network engineers and technicians when a problem occurs—all from a user's web browser. By placing a series of measurement probes at base stations across a network, network engineers can obtain 24-hour base station measurements and alert technicians of potential problems and trends, which help predict problems.

Faced with the prospect of spending hundreds of millions



Simplify troubleshooting with remote measurements viewable from a Web browser.

of dollars to maintain base stations over their useful life, carriers are aggressively looking at ways to reduce costs without sacrificing quality. With the Base Station RMS, technician efficiency can increase up to 60%, saving wireless carriers millions of dollars.

"The Base Station Remote Monitoring System has the potential to impact not only operations, but network planning and RF operations within a particular customer," McHenry said. "The ability to monitor parameters such as base station power usage and traffic statistics simultaneously, for any base station in the network at any time, provides very powerful information."

Developed with an Internet

browser-based interface, engineers and technicians can view a base station's health and diagnose problems remotely in real-time, which better utilizes on-site testing and resources.

Probes installed in each cell site can monitor:

- Antennas and feedlines
- Base station output power & quality
- Call functionality
- · Wireless data tests
- Backhaul links (T-1/E-1)
- Air interface forward and reverse spectrum analysis
- Other site alarm events

The Base Station RMS helps expand networks and deploy next generation services and technologies without substantially increasing wireless service providers' expenses. It allows wireless carriers to increase the amount of

base stations without increasing the amount of personnel. In addition, it allows engineers and technicians to operate more efficiently by eliminating unnecessary truck rolls.

"It used to be that carriers had to schedule preventative maintenance tests to spot problems with base stations. Now the pressure is such that carriers can't do testing because there is no time or manpower," said Bill Walkowski, industry marketing engineer with Agilent's Wireless Network Solutions business unit. "Carriers are getting backed up to the flames as time goes on. This solution allows them to do a lot of preventative maintenance testing without lifting a finger."

### AIR INTERFACE REMOTE MONITORING SYSTEM

The amount of work that wireless carriers have to complete to expand their networks seems infinite. And there are a lot of problems that may or may not be anticipated. Many drive tests have to be performed to ensure network performance levels are met. The use of remote monitoring tools to perform unmanned drive testing can improve efficiency by having continuous data sent back to a centralized database for engineers to analyze at the central office via a standard Web browser.

"Carriers are interested in being able to grow networks and improve performance, but they are not always sure where the problems are," Walkowski said. "Customers are looking for solutions and answers, so they need to first understand where they need to focus their efforts. They need answers within hours, not weeks."



Reduce unnecessary truck rolls and drive tests with Agilent's Remote Monitoring System.

The Agilent Air Interface RMS is an unattended drive-test solution that consists of a system of remote measuring probes and a central server to maximize engineering resources. The Air Interface RMS can perform 24-hour monitoring for engineers to proactively understand problems within a network. It not only provides good historical trending analysis when measuring a wireless network, but also provides much finer resolution of problems from a geographic basis and time basis. By using geographical RF performance measurements from both busy hour and non-busy hour time resolution, the Air Interface RMS can detect network problems and provide solutions while reducing the need for normal drive tests.

Data gathering probes can collect the following measurements:

- Call statistics
- Serving cell information
- Neighbor cell information
- Location
- Dropped calls
- Access failures
- Frame error rate (FER)
- Data throughput
- RF performance
- Layer 3 messaging

"The Air Interface Remote Monitoring System allows operators to focus time on the problem at hand, letting engineers be engineers," Walkowski said. "Remote monitoring gives service providers the use of resources in field to collect data With the Air Interface RMS, engineering staffs increase efficiency by remotely analyzing data and correcting net-

located."

work problems before customers are affected via a centralized server with an interactive Web interface.

so engineers in the office can understand where problems are

The Air Interface RMS, developed with components from Agilent Labs, is tailored to engineering teams within a wireless network, providing multiple views of the network. Designed to optimize wireless networks, the Air Interface RMS collects RF performance, data service and event measurements via remote probes. By providing a network-wide view of system performance, operators are able to easily identify performance trends. The measurements are repeatable and provide more geographic accuracy than sectorlevel switch statistics.

With the Air Interface RMS, wireless carriers can realize up to a 60% efficiency gain in drive time by engineering staff, a 55% reduction in time-to-solution cycle time, and a range of new monitoring capabilities not available with current methods.

## SATISFYING TODAY'S COMPLEX NEEDS

Carriers are being asked to do more with less. The reality is that capital expenditures have been substantially reduced, but the need to build out networks to meet the demands of today's consumers has not.

So carriers must be more proactive when operating and maintaining their networks. With an increasing amount of equipment to maintain, the ability to monitor network performance and detect problems before dispatching truck rolls and performing unnecessary drive tests is key to saving time and money.

The Agilent RMS radically improves the way everyday base station maintenance and network optimization gets done by letting carriers identify problems, troubleshoot and perform periodic maintenance without driving to a base station or scheduling a drive test. This gives carriers more time to focus on revenue generating activities to grow and improve their networks and reduce operational expenses. With the RMS, technicians will have a better understanding of problems, make better use of on-site test tools, and solve problems quicker when a site visit or drive test is required.

The RMS addresses base station and air interface issues in a wireless network and complements traditional maintenance and optimization equipment in use today. The Agilent Base Station RMS simplifies cell site monitoring and troubleshooting with remote measurements available from a user's Web browser. Both the Base Station and Air Interface RMS will initially target CDMA and cdma2000 technologies, but will expand to include other technologies.

Agilent Technologies is a leading provider of compo-



The Air Interface Remote Monitoring System consists of a system of remote measuring probes and a central server.

nents, test, measurement, monitoring and management solutions for the communications industry. Agilent enables designers, manufacturers and service providers to accelerate the delivery of next-generation devices, networks and services. Agilent's broad set of solutions and services includes optical, wireless, Internet and broadband technologies that span the entire communications life cycle.

For more information about Agilent, its Base Station Remote Monitoring System or Air Interface Remote Monitoring System, call 1-800-452-4844 or visit the Agilent web site at www.agilent.com/find/RMS.