Agilent
Wireless Data Measurement

Product Overview

Maximize your wireless data transmission performance

- Capture and retain your data subscribers through good QoS
- Migrate quickly to packet switched data services
- Quantify performance of your new wireless data network

Agilent Technologies

Manage your data integration

There is a rapid surge of growth in the wireless communications industry, with service providers racing to offer fast data services and Internet access via mobile terminals. To accommodate this, network equipment manufacturers and wireless service providers are migrating to 2.5G and 3G technologies with data services. The move to data oriented wireless communications requires fundamental structural changes and provides the network equipment manufacturers and wireless service providers with an array of new technical challenges. Agilent Technologies offer the test and measurement tools, which meet these challenges and allow a smooth transition to the new enhanced networks and services.

Agilent's network optimization platform offers a true drive test solution, providing end-to-end data testing combined with air interface testing. A range of wireless standards are supported, including GPRS, cdma2000 and UMTS. For a list of available technologies, contact your local Agilent sales and service office. Users can easily identify and resolve problems to speed network deployment. Agilent's drive test platform will allow the addition of up to four phones, or a combination of phones and digital receivers, to evaluate 2G, 2.5G and 3G networks simultaneously from the same laptop PC. The flexible, scalable drive test platform is evolving to address the new technology formats required to meet future 3G network deployment goals.

Your customer expects a high quality of data services.

Agilent's established series of drive test systems includes a wireless data measurement capability. This tool is an invaluable aid at the initial trials, network installation and in-service / network optimization life cycle phases, giving the service provider full confidence that the end user is receiving a high quality of service.

Data measurements

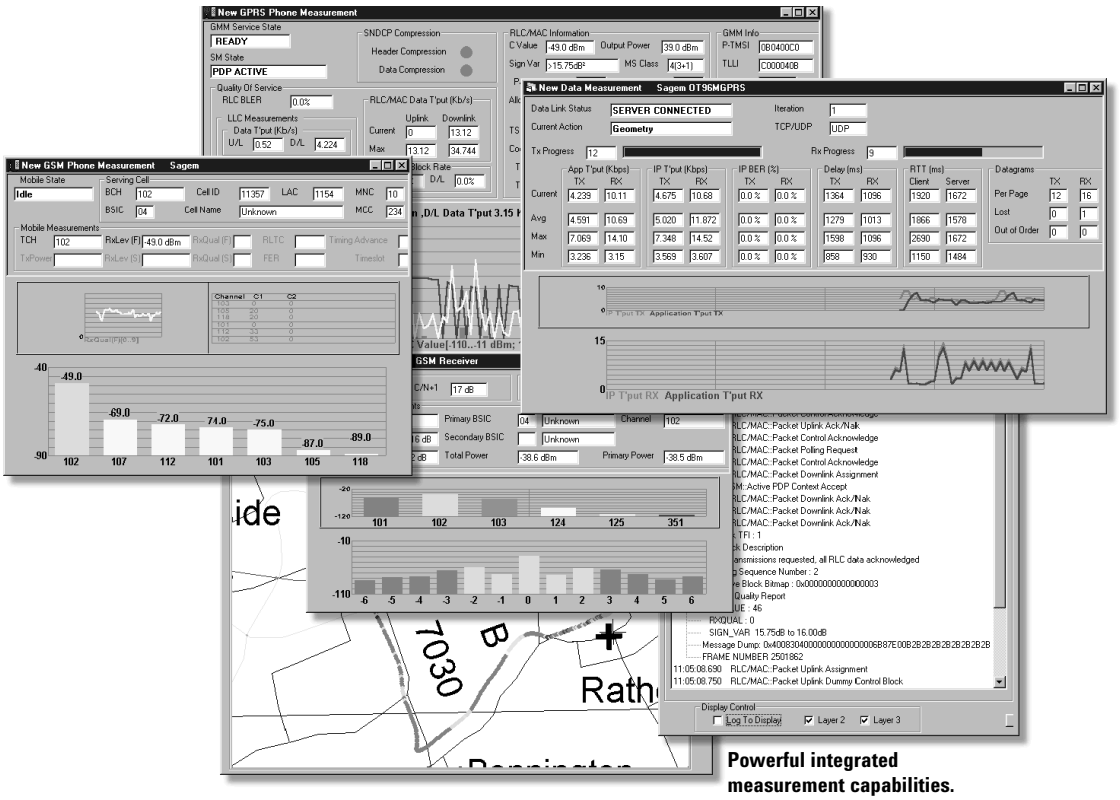
With the convergence of mobile phones and the Internet, wireless networks need to be optimized for data services. Agilent offers two options for our drive test products which enable end-to-end testing of data connections with independent transmit and receive measurement capabilities. Key data characteristics such as bit error ratio, packet error rate, latency and data throughput can be measured together with network accessibility and recorded for post processing analysis.

The wireless data measurement capability utilizes the Agilent network optimization platform and is based on a mobile client(s) and fixed server(s) architecture with user definable data application sequencing. Test results are collected and displayed on the mobile client(s).

This addition to our drive test portfolio is seamlessly integrated with existing drive test solutions and enables measurements to be made simultaneously across multiple networks.

Scalability

The scalability of Agilent Technologies' drive test tools allow quick migration to multi-format (CDMA, GSM, GPRS, W-CDMA/UMTS and cdma2000) and multi-application (outdoor, indoor, optimization and benchmarking) configurations.



Powerful integrated measurement capabilities.

Ensure your data transmission quality

The wireless data measurement software for mobile client and fixed server allows you to view your data transmission capability from a subscriber's viewpoint and to characterize the air interface performance, while transmitting data over the network. The functionality enables you to quantify the whole network performance, to diagnose problem areas quickly and to maximize the quality of data services now.

The Agilent client/server data measurement approach gives you an invaluable and flexible set of tools for use during the trials, integration and in-service phases of your data network life-cycle.

Powerful troubleshooting capability

The server can be connected at various stages of the network's communication chain, where an IP interface is available. This allows elements of the system to be eliminated from the test 'loop' giving a powerful diagnostic capability. In addition a single server can support several clients simultaneously.

Data measurement system architecture

The architecture is based on mobile client(s), which consist of a laptop PC, a mobile device(s), a fixed server(s), and application software. A digital receiver can also be added to give additional air interface diagnostic featrues. Data exchanges are initiated and managed by a user defined sequence of transactions. Both mobile transmit and mobile receive paths are independently measured with the results being collected and displayed on the mobile client(s). This test architecture ensures that the mobile users perspective of the end-to-end network is quantified.

Typical data measurement results provided include:

- Data integrity; accuracy of data transmitted
  - Bit error ratio, data fragmentation
- Data throughput; speed of data transfer in both directions
  - Max, min and and average throughput at link and application layers
- Network accessibility
  - Server connectivity, including Ping and Tracert utilities
- Delay measurements (transmit and receive)
  - Packet one way delay (latency)
  - Packet round trip delay (RTT)

Client and server functionality

Client Functionality:

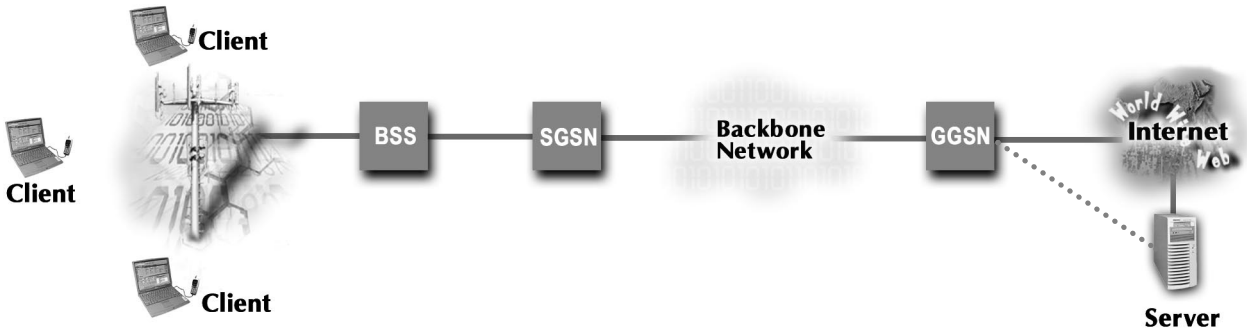
- Initiate network connections and data transaction sequences
  - Controls mobile devices
  - Data transaction control for transmit and receive paths via data sequence editor
  - Transmits data to the server
- Process received data from the server
- Sequence commercial server transactions
- Log measurement results
  - Data measurements
  - Regular drive test measurements

Server Functionality :

- Measures data received from the client(s)
- Returns these results to the client(s)
- Generates test data to be sent to the client(s)

Note:

Supports TCP and UDP data formats and access ports



High level depiction of the wireless data measurement architecture.

Data measurement methodology

The client/server communication chain encompasses the mobile wireless network and the backbone infrastructure, giving you visibility from the end-user's perspective. The server(s) can be positioned at strategic IP Interface compatible points within the communications infrastructure to give powerful air interface and network component troubleshooting capabilities through a combination of multiple network taps (via the servers) and measurement and message logs (via the client). The data measurement software provides automated control of the mobile devices from the client PC and initiates sequences of data transactions to and from the server. The user has the ability to create and customize these data actions, giving full flexibility of asymmetrical data transmitted and received. These test sequences will simulate customer usage of the wireless data connection, such as web browse, e-mail, WAP access, financial transactions, file downloading, and news group access. The data measurement capability also enables user defined port control access.

Utility tools such as PING and Traceroute can be used to validate the server's availability and to give visibility of the connection route, enabling consistency on comparison testing.

Data is transferred over-the-air from the client into the network and then to the server. The server software verifies the integrity of the data, carries out performance measurements, and returns reply data containing the performance and integrity results along with the relevant test data sequence. This data is then transferred through the network, to the base station, where it is transmitted to the client. The client software carries out performance measurements on the return path and verifies the data integrity. The client displays transmit and receive path measurement results and captures them on the drive test database.

Commercial server support

The client software supports sequencing of http and FTP transactions to public internet servers. This allows the drive test to be performed while carrying out web browsing. Measurements on received data quantity, time to receive data and throughput are returned for public internet transactions. This feature can only support a single mobile device.

Note: Microsoft® Internet Explorer 5.0 or later (not supplied) is required to support commercial server sequencing.

System requirements

Client

For client platform minimum laptop PC specification and relevant hardware requirements please refer to the relevant wireless solutions specification.

The client's full trace functionality is available when used in conjunction with a data-enabled test mobile. Check for availability of test mobiles appropriate to your target technology. A maximum of two mobiles can be supported by each client laptop when carrying out simultaneous data and trace measurements. Agilent Technologies can supply hardware, if required.

Data measurements are also available through the use of commercial mobiles. Up to four[1] commercial data-enabled mobiles may be connected to the drive test system's client laptop for simultaneous data transaction sequencing and collection, enabling benchmarking or network loading.

The client's wireless data measure-ment application software is supplied on CD-ROM together with a software protection key.

Server

The server is designed to be unmanned, after initial setup. The server software performs error checking on the incoming data and replies with encoded pages including the results information. No results are saved on the server. The minimum server system requirements are as follows:

- Windows® 2000 server operating system platform or Windows NT® 4.0 + service pack 5 (or later)
- PIII, 500 MHz, 64Mb RAM

Agilent Technologies can supply hardware, if required.

The server's wireless data measurement application software is supplied on CD-ROM together with a software protection key.

A GPS receiver is required at the server if delay measurements are required. Synchronize application software is supplied.

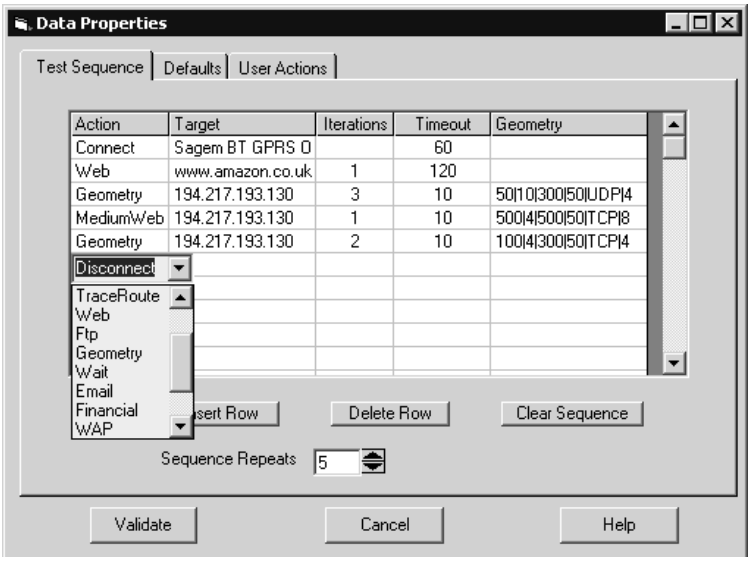
1. Up to four mobiles are suppoprted on Windows® 2000 operating system, up to two on Windows® 98.

Key features and specifications

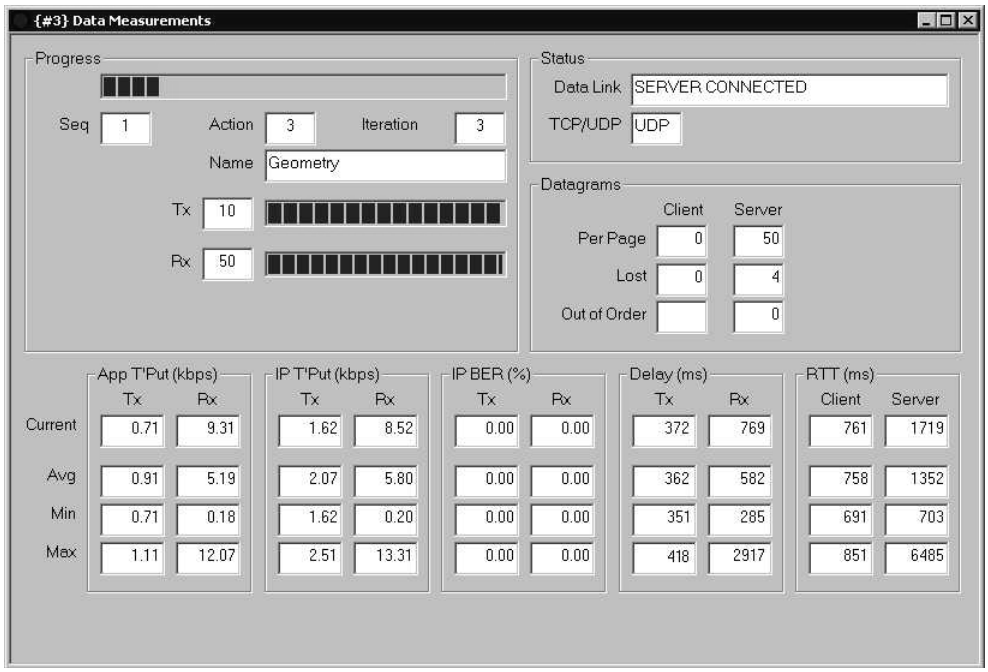
The wireless data measurement capability are software options available on Agilent Technologies' drive test systems for all packet switched technologies (check for current availability).

Use the software options to:

- Get a user's point-of-view of wireless data network performance
- Characterize data transmission performance (end-to-end)
- Measure transmit and receive paths independently
- Measure and report on data integrity
- Measure and report data throughput
- Measure and report on network accessibility
- Measure and report on delay
  - Packet one way delay time (latency)
  - Packet round trip delay (RTT)



Flexible control of data transactions.



Measure key data parameters.

Ordering Information

E6474A Wireless Network Optimization Platform

❑ E6474A-700 - Data Measurement Software License
❑ E6474A-710 - Data Measurement Server Software License

E7478A GPRS drive test system

❑ E7478A-200 – Data Measurement Software License
❑ E7478A-220 – Data Measurement Server Software License

E7477A cdma2000 drive test system

❑ E7477A-200 – Data Measurement Software License
❑ E7477A-220 – Data Measurement Server Software License

Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

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Printed in USA May 28, 2002
5980-2310E

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