Agilent
Wireless Data Measurement

Data Sheet

Wireless data measurement software performs end-to-end measurement of transmitted and received data. It measures performance as seen by the mobile user. Some examples are wireless web access, file transfer and e-mail transactions.

A client/server architecture is created using a laptop PC and mobile phone combination (client) with a remote PC (server). The server can support several clients.

The wireless data measurement software includes data testing support for both packet switched and IP over circuit switched. Circuit switched (CSD and HSCSD) data testing is supported on commercial wireless devices, which can be configured as a dial-up networking connection in Windows®. Connection to the remote data server is via a dial-up Internet Service Provider (ISP) account.

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About this data sheet

This document gives detailed information on the wireless data measurement features supported on the Agilent network optimization platform. These data measurements are available through the procurement of the data measurement software license and the data measurement server software license, refered to in the configuration guides. Wireless data measurements are fundamental in the verification of the end-to-end performance of wireless IP networks.

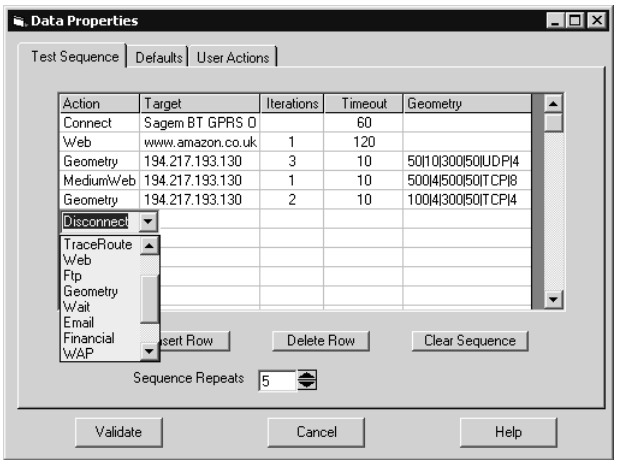

Figure 1. Data call control user interface.

Data measurement software options on the Agilent network optimization platforms

Data measurement software license

The data measurement capability utilizes a client/server architecture, where the client is the laptop and mobile phone combination and the server is a remote computer connected to an IP interface within the GPRS network. The system is designed to allow a single server to support several clients. The data control and measurement user interface resides on the client laptop and gives access to the following measurement views:

- ❑ Data properties
  - ❑ Provides sequencing of controlled, repeatable data transactions between the client(s) and the Agilent server(s)
  - ❑ Provides sequencing of actions to commercial servers
- ❑ Data measurement
- ❑ Web measurements

The purchase of an Agilent data measurement server software license is required to support the full client/server measurement capabilities. This software provides sequencing of actions to the public Internet (for example, web browsing to www.agilent.com) and application throughput measurements on data received from these servers. Agilent server and commercial server data transactions can be initiated within the same sequence events.

Data call control

System software provides automated control of the mobile device(s) from the PC and initiates user selectable sequences of data transactions to and from the server. The user has the ability to customize and create data actions through the manipulation of data page sizes and delay between pages, which allows full flexibility of asymetrical data transmitted and received. A set of default data "actions" are selectable from the Data Call Sequence Editor (e-mail, financial, medium web, etc.). The data properties view provides the following control and monitoring functions:

- **Defaults Panel** - enables flexible control of time out, retries and repeats via:
  - Connect Time Out (sec)
  - Geometry Time Out (sec)
  - Web Time Out (sec)
  - UDP Window Length

    This sets the number of packets that are held in the network at any one time. A value of 8 corresponds to a handshake after every eighth datagram transmitted.
  - Lost Lines Limit

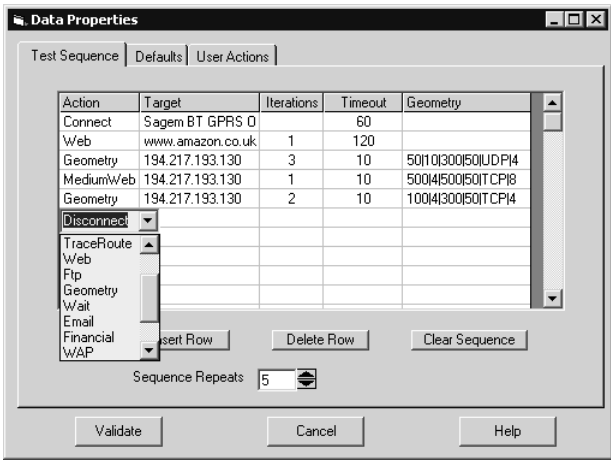

Figure 2. Data properties user interface.

- **Test Sequence Panel** - Enables the user to control the sequence of data transactions, edit the data structure, select the transport mecha nism (UDP or TCP) and the target URL or IP address via:
  - Action
  - Target
  - Iterations
  - Timeout
  - Geometry
- **Call Initiation**
  - Start
  - Stop
- **User Actions Panel** - Gives the user access to the useractions.txt file. The user can control the geometry of all default actions (Email, LargeWeb, WAP, etc.) and can define new defaults.

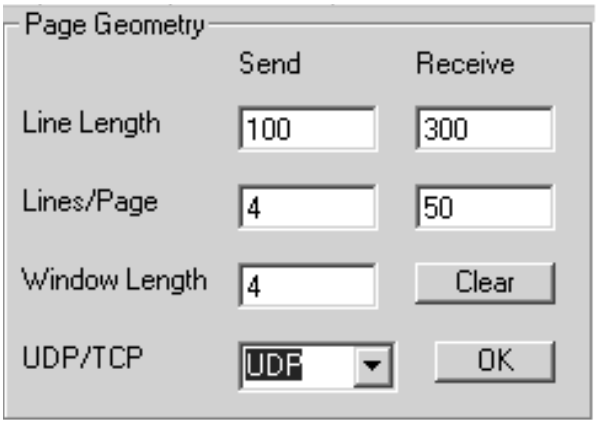

Figure 3. Page geometry parameters.

Data measurements

The Agilent network optimization platform data measurement option captures information from the mobile, the client PC and the server PC (when used in conjunction with the Agilent data measurement server software option). Measurement data on availability, reliability and data throughput can be captured with these options. The measurements are based on user selectable data page sequences, constructed of lines of data allowing simulation of various applications (for example e-mail, file download, web browsing). Page sizes can be independently defined for transmit and receive paths, with measurements displayed for both IP link and application layers.

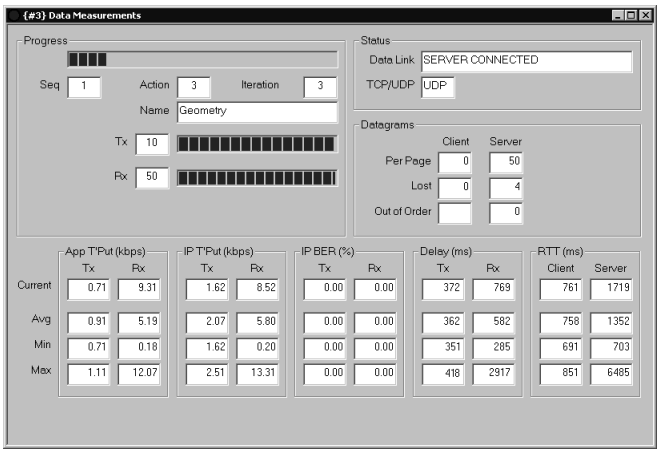

Figure 4. Data measurements user interface.

- **Progress**
  - Reflects the progression of the data test sequence, as defined on the Data Properties view. The progress is also represented as an incrementing bar.
- **Status**
  - Indicates if the transactions are UDP or TCP and the current status of the data call (exam ples include Dialing, logging on, Server Connected).
- **IP Throughput (Kb/s)**
  - Tx and Rx
    - Current
      - Displays the current rate (Kbps, aver aged over at least 1 second) per line at which data is being sent and received on the IP layer
    - Avg
      - Displays the average throughput data transfer rate (Kbps), over the current page, being sent and received
    - Max
      - Displays the maximum throughput data transfer rate (Kbps) achieved during the current page transfer
    - Min
      - Displays the minimum throughput data transfer rate (Kbps) achieved during the current page transfer

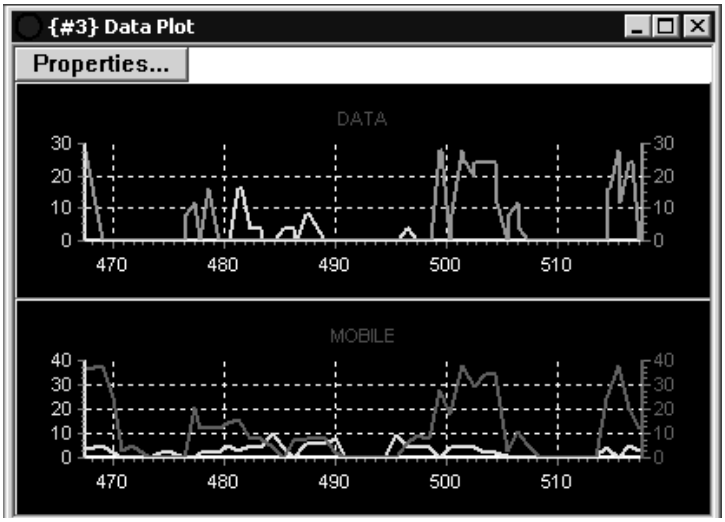

Figure 5. Data plot interface.

- **Application T'put (Kb/s)**
  - Current
    - Displays the current rate (Kbps, aver aged over at least 1 second) per line at which data is being sent and received on the application layer
  - Avg
    - Displays the average throughput data transfer rate (Kbps), over the current page, being sent and received
  - Max
    - Displays the maximum throughput data transfer rate (Kbps) achieved during the current page transfer
  - Min
    - Displays the minimum throughput data transfer rate (Kbps) achieved during the current page transfer
- **IP BER** (Bit Error Ratio - the ratio of the bit errors to the amount of data being sent or received)
  - Tx and Rx
    - Current
      - Displays the BER per line (averaged over at least 2 seconds) for the data being sent and received
    - Avg
      - Displays the average BER, per page, being sent and received
    - Max
      - Displays the maximum BER achieved during the current page transfer
    - Min
      - Displays the minimum BER achieved during the current page transfer
- **Delay** (ms) - packet one-way delay time for both transmit and receive paths (requires client/server time synchronization)
  - Tx and Rx
    - Current
    - Avg
    - Max
    - Min
- **RTT** (ms) - packet round trip delay, from the client and server perspective
  - Tx and Rx
    - Current
    - Avg
    - Max
    - Min
- **DATAGRAMS**
  - Per Page
    - Displays the number of datagrams per page, sent and received
  - Lost
    - Displays the number of datagrams lost per page, sent and received
  - Out of Order
    - Displays the number of out of order data grams per page, sent or received
- **Web Measurements** - this view gives progress information and results from public http or FTP transactions which can be accessed and sequenced without the Agilent Data Measurement Server Software.
  Results reported are:
  - Total size
  - Download time
  - Throughput

  These results are displayed per element. The progress of the data properties sequence is displayed along with the current URL or IP address being actioned.

Graphic representation

IP throughput and application throughput on both the transmit and receive paths are graphically represented via the Data Plot view.

Data measurement server software license

The server is used to capture a number of data flow throughput measurements and to transmit them along with data pages (for example, simulating Internet / Intranet browsing, e-mail service, file transfer and more) back to the mobile client for analysis and characterization. The server hardware can be connected to the Gn, Gp or Gi interfaces at the networks GGSN or within the public internet. The data measurement server software license requires the purchase of at least one data measurement software license and will support access of up to ten clients, simultaneously. The data measurement server software resides on the server and once installed, requires no user access.

The clients and Agilent data servers require to be time synchronized in order to calculate the packet one-way and round trip delay times. Both the client and the server will acquire their time sync from GPS or a network based time sync (server only) that is synchronised to GPS time. A separate application called Tardis© is used to feed the GPS or network time to the server PC. This application runs under windows and will be shipped with the data server software.

Minimum Server PC Specification

500MHz Pentium III, 64MB RAM running Windows NT 4.0 +service pack 5 (or later) or Windows 2000 operating system

Server Setup

Note that it is the user's responsibility to ensure that the server is setup with a fixed IP address and is addressable from the wireless network.

Additional Agilent literature

- ❑ E6474A Wireless Network Optimization Platform Product Overview.....5988-3558EN
- ❑ E6474A Wireless Network Optimization Platform Configuration Guide.....5988-2396EN
- ❑ E7478A GPRS Drive Test System Product Overview.....5980-2375E
- ❑ E7478A GPRS Drive Test System Configuration Guide.....5988-1505EN
- ❑ E7477A cdma2000 Drive Test System Product Overview.....5980-2131E
- ❑ E7477A cdma2000 Drive Test System Configuration Guide.....5980-2308E
- ❑ Wireless Data Measurement Product Overview.....5980-1470E
- ❑ Network Optimization Brochure.....5980-0216E
- ❑ **I**ndoor Wireless Measurement System Product Overview.....5968-8691E

Please refer to:
www.agilent.com/find/serviceproviders
for additional information.

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