

GPRS Consultants

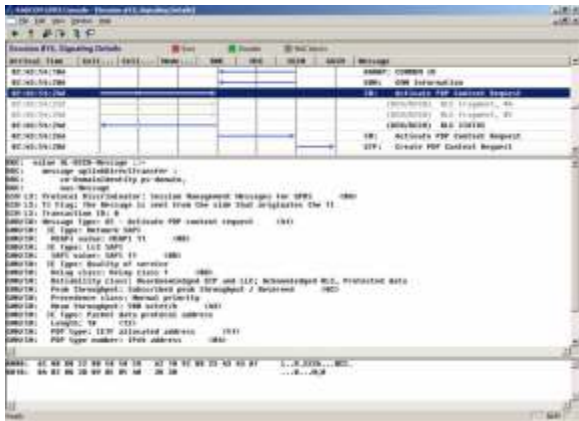
Network Monitoring and Analysis

The GPRS Consultants are analysis tools that provide online and offline session analysis and QoS monitoring of GPRS networks. As part of RADCOM's Cellular Performer suite, the Consultants address issues on both the signaling and user planes, and are suitable for vendors developing and installing GPRS equipment and services, wireless operators testing and deploying GPRS networks, network integrators, QA and inter-networking labs. Focusing on key testing issues in GPRS networks, the GPRS Consultants support signaling verification, user data transmission problems, QoS, performance and network functioning, network utilization and efficiency. Analyzing the various transactions on the line, the Consultants display a clear session summary view, as well as detailed session information such as delays, expected and actual throughput, used protocols and more. The GPRS Consultants analyze the network layer, offering a unique expert tool for infrastructure problems related to configuration or capacity. Additionally, they save data for offline analysis, enabling tendency research and benchmarking. Used with RADCOM's Network Consultant, the Consultants can correlate flow information from several interfaces and analyze problems all across the network.

The GPRS Consultants can be integrated with RADCOM's database-assisted Cellular Expert to provide long-term, network-wide, high-capacity analysis of network condition and performance. An integral part of the Cellular Performer distributed model, the Consultants can be accessed from any authorized client console across the LAN or WAN. The GPRS Consultants are complemented by the UMTS Consultants. Together, they guarantee smooth transition and integration with 3G networks.

Session ID	Status	Expected Throughput (Kbps)	Actual Throughput (Kbps)	Delay (ms)	Protocol	QoS Class	QoS Parameters
1	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
2	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
3	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
4	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
5	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
6	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
7	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
8	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
9	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
10	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
11	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
12	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
13	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
14	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
15	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
16	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
17	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
18	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
19	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found
20	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found	Not Found

Session Summary View



The Network Consultant enables network-wide information correlation across various interfaces

Highlights

- Automatically discover, display and monitor thousands of active and closed GPRS sessions.
- Detect and troubleshoot session-level problems.
- Monitor various network interfaces, including Gb (ciphered or clear), A, Gs, Gn, Gp, Gr, Gf, Gc, Gd and Gi.
- Decipher Gb traffic at full line rate.
- Display information flow at a single interface or across the network.
- Display session information, including identities, status, MS location and traffic size.
- Test signaling conformance and performance.
- Analyze IP traffic, including throughput, protocol distribution, and application performance.
- Monitor critical QoS parameters and compare requested QoS, accepted QoS and actual service parameters (such as peak and mean throughput).
- Detect network-level errors such as rejected calls (and their causes) and discarded frames.
- Record problem solution to accelerate future troubleshooting.
- Decode and analyze all 7 layers of the GPRS signaling and user planes.
- Run in both online and offline modes.



TEST-OF-THE-ART

Applications

Monitoring GPRS Sessions

The GPRS Consultants display the current state of all detected sessions in real-time: Attach, Active, Detached, etc., as well as signaling messages and times.

Sample Testing Scenarios

- ▶ View the identifiers of a call in real-time, simplifying problem resolution. The GPRS Consultants automatically display identifiers such as IMSI, P-TMSI, IMEI and IP address. In addition, they follow the signaling messages and update the identifiers as they change.
- ▶ Verify that a problematic subscriber is connected and the current state is correct. The GPRS Consultants display all sessions on the link, easily verifying that a specific subscriber is connected.
- ▶ Verify network performance. The GPRS Consultants analyze setup times for specific users and aggregate statistics for attach and detach procedures, PDP context activation and deactivation, and other procedures.
- ▶ Track user location changes, validate hand-over procedures and LCS systems.

Monitoring GPRS QoS

The GPRS Consultants follow signaling messages and track the actual QoS parameters requested or accepted by the network. By analyzing user throughput, the actual QoS parameters can be monitored. The GPRS Consultants compare results and display an accurate picture of user-perceived quality of service.

Sample Testing Scenarios include:

- ▶ Verify that a problematic user has actually received the requested QoS parameters. The GPRS Consultants display both the requested and accepted QoS parameters for each PDP session.

- ▶ Test the mean and maximum throughput settings, by comparing the parameters to the actual throughput.
- ▶ Monitor change of throughput as the user switches between applications.
- ▶ Look for fluctuations in the TCP window size to determine the cause of throughput problems.

GPRS Network Analysis

The GPRS Consultants allow network operators to access a network-wide view of GPRS sessions. The Consultants identify and highlight errors, which are the first sign of problems on the network. Errors include rejected sessions, forced standbys, dropped packets, timeouts and more.

Sample Testing Scenarios

- ▶ Follow signaling across the network to pinpoint a faulty system component.
- ▶ Follow GSM/GPRS-UMTS handovers to verify voice-call or IP-session continuity. Monitor errors and problems identified on the network. For example, the GPRS Consultants save the attach reject rate, and together with general signaling statistics, benchmark the network.
- ▶ Identify problems before they cause degradation of network performance.
- ▶ Record the call length and bandwidth usage parameters required for billing systems. The GPRS Consultants can be used to verify and test new billing features or new billing systems, without negative impact on paying customers.
- ▶ Locate the cells that create most of the errors or the most loaded cells, which need some resource reallocation.

Combining the Consultants with the Cellular Expert provides powerful analysis of network conditions



GPRS Consultant

The Performer

The Cellular Performer is a comprehensive cellular test solution for vendors, QA and integration labs, R&D and operators. Based on the field-proven Performer platform, it integrates RADCOM's proprietary GEAR (generic analyzer processor chip), which provides hardware-based full line rate analysis capabilities at up to 2.5 Gbps. The complete Cellular Performer suite offers a range of applications for troubleshooting 2.5 and 3G networks, including GPRS, EDGE, UMTS and CDMA2000.



R4000 Cellular Performer

Specifications

Monitored Interfaces

Gb, A, Gs, Gn, Gp, Gr, Gf, Gc, Gd, Gi
Platforms

Ordering Information

PA-GPRS Gb Cons
PA-A Cons
PA-Gn Cons
PA-CN Cons
PA-Internet Cons
PA-Network Cons
EX-Basic

Performer Console - Minimum Configuration

PC: Pentium III 800, 256 MB RAM or more (recommended)
Monitor: VGA 1024 x 768
Hard disk: Minimum 4 GB free for program files
At least 2 GB recommended for data storage
Operating System: Windows 2000/XP

Performer Servers

R1000, Rack-mount 2U, Performer/Probe Server
Number of FEPs: Up to 2 plus Sync card
Dimensions: w x d x h = 440 x 470 x 89 mm (17.5 x 18.7 x 3.5 in)

R4000, Rack-mount 5U, Performer/Probe Server

Number of FEPs: Up to 8 plus Sync card
Dimensions: w x d x h = 430 x 680 x 220 mm (17 x 27 x 8.7 in)

P1000, Portable Server

Number of FEPs: Up to 3 plus Sync card
Dimensions: w x d x h = 360 x 480 x 130 mm (14.17 x 18.9 x 5.11 in)

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