



APPOINTMENT OF A SUITABLE SERVICE PROVIDER TO PROCURE THE SUPPLY, INSTALLATION AND COMMISSIONING OF QUALITY OF SERVICE (QoS) BENCHMARKING SOLUTION TO TEST THE PERFORMANCE AND MONITOR QUALITY OF SERVICE OF THE MOBILE TELECOMMUNICATION SERVICE PROVIDERS FOR VOICE, DATA, VIDEO, AND MESSAGING SERVICES.

1. Background

- 1.1 ICASA is mandated to ensure provision of good QoS by licensed telecommunication operators and service providers.
- 1.2 QoS is described as the ability of a mobile network to provide a service at an assured service level. QoS is very critical in mobile communication network technologies including second generation (2G/GSM), third generation (3G/WCDMA), fourth generation (4G/LTE), fifth generation (5G) and WiFi systems.
- 1.3 The Authority intends to source through an open bid from eligible bidders, a QoS Benchmarking Solution that comprises of a Drives-test system, Walk Test system, Post-processing tool, Server and a Scanner, which will provide benchmarking of network performance in measuring voice, data, video and messaging services.
- 1.4 The proposed QoS Benchmarking Solution will be used to evaluate the performance of mobile services in South Africa in terms of service availability, accessibility (blocked calls), retainability (dropped calls), network coverage (signal levels) and quality of service.

2. Scope of the work

The scope of work entails the following deliverables:

2.1 QoS Monitoring/Benchmarking solution

2.1.1 ICASA seeks to acquire an integrated QoS Benchmarking solution that shall assess the quality of service for voice, data, video and messaging services in South Africa.

2.1.2 The solution shall be comprised of the following components/systems, which will include:

- a. A Drive-test system with twenty-four (24) User Equipment (UEs) that can be setup to conduct measurements in 2G/3G/4G/5G/ Wi-Fi mode, mounted in a vehicle.
- b. Walk-Test/Portable system (Backpacks), with twelve (12) UEs that can be setup to conduct measurements in 2G/3G/4G/5G/Wi-Fi mode.
- c. 1 x Scanner that can support 5G NR, LTE (FDD and TDD), LTE-LAA, NB-IoT, UMTS/WCDMA, CDMA, EV-DO, GSM, Wi-Fi, P25, DMR, TETRA technologies with scanning capability of 10 MHz - 6 GHz frequencies, including layer 3 decoding.
- d. Post-processing Tool, that supports 2G/3G/4G/5G and WiFi reporting and analysis. The tool should be compatible with logfile type formats; SQZ, NMF, TRP. Perpetual license with support for at least three (3) years with an option to extend support.
- e. Intermediate server for remote test set up, data storage and system function configuration. The server needs to be Rack Mountable (1U or 2U), minimum 2 x 3.2 GHz Processors, minimum 2 TB storage.

Detailed specifications are provided in Appendix A.

2.1.3 The solution shall record QoS events including blocked calls, dropped calls, signal levels, poor quality signals, low throughput thresholds and other significant events related to QoS KPIs.

2.1.4 The solution shall have capability for local and remote configuration to enable continued operation in case of failure of the central control system or associated communication link. The configuration of the solution must not only rely on network coverage availability but must be configured locally without relying on the network.

2.1.5 The solution shall be of a mobile nature, easily deployed and transferable in different modes of transport (such as cars, public buses, etc.) or can be installed at a designated location to be specified by ICASA.

2.1.6The solution shall be able to automatically upload the captured data to a central control facility for processing and reporting. The frequency of upload of captured data shall be configurable. The system shall provide for manual upload as a redundancy mechanism to the auto upload.

2.1.7The system shall be able to monitor the following voice call scenarios;

- a. Mobile to Fixed (M2F) subscriber
- b. Mobile to Mobile (M2M) subscriber
- c. Fixed to Mobile subscriber

2.1.8The test used in the various measurements done by the system shall simulate typical end-user behavior. The solution shall be able to:

- a. Simultaneously conduct voice, data, video, and messaging measurements for each mobile service provider.
- b. Conduct the parallel measurements in (a) for each service provider

2.1.9The system shall support QoS testing of Voice, Data, Video and Messaging services offered in the different frequency bands as specified in the National Radio Frequency Plan (NRFP) using technologies, including, but not limited to GSM, EGSM, GPRS, EDGE, WCDMA (UMTS), HSUPA, HSPA+, HSDPA, LTE-TDD, LTE-FDD, LTE-A, Wi-Fi, VoLTE and 5G. The bidder shall provide a comprehensive list of technologies supported by the proposed system.

2.1.10The system shall support QoS tests for Voice, Messaging, Video and Data services in accordance with the "ICASA quality of service parameters" as specified in SANS-1725-1 (Voice Standard), SANS-1725-2 (Data Standard).and End-User and Subscriber Service Charter regulations as well as the respective international standards including, but not limited to, ITU-T E.804, ITU-T P.863, ITU-T P.862.1, and ITU-T P.861.

2.1.11The system shall allow flexibility for users to customize key performance indicators (KPI), test cases and report templates.

2.1.12The system shall log and decode all protocol layer messages (Layer 1, Layer 2 and Layer 3) for all technologies measured.

2.1.13In summary, the system shall be able to provide the following:

- a. Raw measurement data
- b. Analysis reports in format specified by ICASA
- c. Root cause analysis of QoS issues and identification of problem location.

2.2 Installation

- 2.2.1 The Drive-test system must be installed in a vehicle (to be provided by ICASA), while Walk-test system is provided in Backpacks.
- 2.2.2 The supplier shall install the Drive-test system together with the scanner and inverter in the vehicle and configure all components and shall at all times ensure proper operations of the system and solution.
- 2.2.3 The server shall be installed in ICASA's server room.
- 2.2.4 The supplier shall provide remote upgrade of software and remote installation of software patches at no additional costs to ICASA.
- 2.2.5 The commissioning and installation will take place at ICASA's Head Office (Centurion) or at premises that are agreed on by ICASA and Supplier.
- 2.2.6 Vehicle installation will include but not limited the following: Cabling, Power Inverters, Antennas, GPS and Cabinets with shock mountings to ensure a complete working system.

2.3 Product Support and Licensing

- 2.3.1 The supplier shall have an online portal for logging of faults and complaints and may supplement this portal with other reporting platforms.
- 2.3.2 All support for software/hardware required for the proper functioning of the solution shall be valid for three (3) years after solution acceptance.
- 2.3.3 The supplier shall provide licenses, remote upgrades of software, and installation of software patches for at least three (3) years from the date of installation of the solution at no cost to the Authority.
- 2.3.4 The supplier must state the manufacturer's Original Equipment Manufacturer (OEM) end of support for the product, which shall be at least 3 years from date of installation. This must be supported by the product roadmap of the proposed solution.
- 2.3.5 The supplier shall provide proof that they have the support from the (OEM) regarding the availability of spares and repair facilities. The supplier must provide sample Service Level Agreement (SLA) indicating turnaround time in providing the spares and mean time to repair.

2.4 Mandatory

2.4.1The supplier shall provide proof that they are registered and authorized OEM supplier or distributor.

2.4.2The supplier must have local presence including office in South Africa with technical support staff for troubleshooting.

2.4.3The supplier shall provide product description that relates to the offered solution.

2.4.4The supplier shall provide a project plan.

2.5 Guarantee

2.5.1The supplier shall provide three years guarantee on all the devices. The supplier must provide confirmation at the time of bidding of full guarantee including but not limited to:

- a. After sales support and maintenance by the system manufacturer
- b. Any spare parts required.

2.6 Manuals

Manuals on the system that guide on how to operate the system, conduct troubleshooting and basic service maintenance of the system must be provided in soft and hard copy at the time of delivery of the solution and shall be in English.

2.7 Acceptance and Approvals

The supplier shall provide a checklist of items listed in 3.1 which will be signed by both parties after delivery of the solution components. A full functional test shall be conducted on the system after installation to confirm that it meets requirements specified by ICASA.

2.8 Training

Within the context of this procurement, the supplier shall provide full training to a minimum of 20 officers of ICASA. The training shall cover the functionality and maintenance of the system with practical hands-on sessions. The training shall be done on the actual system being supplied under this procurement.

Performance measures

The supplier is expected to provide ICASA with a QoS Benchmarking solution that consists of a Drives-test, Walk Test, Post-processing Tool, server and a Scanner which are capable of benchmarking the performance and QoS of, voice, data, messaging and video services. The system should be able to measure the following mobile service KPI's: service availability, accessibility, retainability, service/network coverage and quality of service as detailed in the technical specifications in Annexure A.

Monitoring progress on assignment

The Project Leader shall do the on-going management of the Service Level Agreement (SLA) in accordance with the contract.

Sourcing method

The service goods/service will be procured through an open bid in terms of ICASA's Supply Chain Management policy.

Briefing Session

Non-Compulsory virtual briefing session will be conducted.

Pre-qualification criteria

Bidders will be evaluated on Functionality based on the pre-qualification criteria. The minimum qualifying score for functionality is 70 points out 100 points. Only bidders who obtain the minimum qualification score will be evaluated in accordance with the 80/20 procurement principles as prescribed by National Treasury Regulations.

Table 1 Bid Evaluation criteria and weights

A. Functionality: Pre-qualification criteria	Weight	Grading
<p>1. Completeness of project plan covering the entire scope of work as defined in Section 3.</p> <p>The Service Provider must provide a detailed project plan showing the following:</p> <ul style="list-style-type: none"> (1) Work breakdown structure, (2) Milestones, (3) Timing, (4) Resources, (5) Project risks management with mitigation plan, and (6) Quality control management. 	30	<p>5 = Project plan covers all 6 requirements</p> <p>3 = Project plan covers 5 requirements</p> <p>1 = Project plan covers 4 or less requirements</p>
<p>2. a. Integration plan (i.e., schematics on how all components listed below integrate with each other);</p> <p>b. Acceptance Test plan (i.e., User Acceptance Test</p>	30	<p>5 = Logistical plan, integration plan, safety plan, and Acceptance Test plan.</p> <p>3 = Integration plan, Safety plan and Acceptance Test plan.</p>

<p>Cases).</p> <p>d. Safety plan.</p> <p>d. Provide logistical plan (i.e., delivery schedule);</p> <p>(1) Drive Test Equipment (24 UEs)</p> <p>(2) Walk Test System (Backpack/s with 12 UEs)</p> <p>(3) Post Processing Tool</p> <p>(4) Scanner</p> <p>(5) Server</p>		<p>1 = Acceptance Test plan and safety plan</p>
<p>1. Proof of support from the Original Equipment Manufacturer (OEM) regarding availability of spares and repair facilities.</p>	<p>10</p>	<p>5 = Provision of Support for 5 years including Local presence/office with electronic fault logging system and dedicated support engineer/personnel</p> <p>4 = Provision of Support for 4 years including Local presence/office with electronic fault logging system and dedicated support engineer/personnel</p> <p>3= Provision of Support for 3 years including Local presence/office, with electronic fault logging system</p> <p>2= Provision of Support for less than 3 years including Local Presence/ office and no electronic fault logging system</p> <p>1 = No provision of Support</p>

2. Provide reference letters with company letterheads from companies where the proposed or similar QoS Benchmarking Solution was deployed.	10	<p>5 = Provide more than three (>3) testimonial reference letters</p> <p>4 = Provide three (3) testimonial reference letters</p> <p>3 = Provide two (2) testimonial reference letters</p> <p>2 = Provide one (1) testimonial reference letter</p> <p>1 = No submission of testimonial reference letters</p>
3. Declaration of Support and Maintenance after installation at no cost for the following requirements <ol style="list-style-type: none"> 1. Licenses, 2. Software upgrades, and 3. Installation of software patches 4. Ticket logging process and system 5. Scanner calibration 	10	<p>5 = includes 5 of the listed requirements, valid for 3 years</p> <p>4= includes 4 of the listed requirements valid for 3 years <i>(combination should include Licences and software upgrades)</i></p> <p>3 = includes 3 of the listed requirements valid for 3 years <i>(combination should include Licences and software upgrades)</i></p> <p>2 = includes 2 of the listed requirements (including Licences), valid for 3 years</p> <p>1 = includes 1 of the listed requirements</p>
4. Provide skills transfer	10	A skills transfer plan covering the

<p>plan for twenty (20) ICASA staff members with timeframes.</p>		<p>following skills area:</p> <p>Hands on training on; (a)Test Equipment & Configuration, (b)post processing tools, (c) Support and maintenance procedures</p> <p>5 = A skills transfer plan covering all of the above, with Learning Outcomes, time frames and the objectives.</p> <p>4 = A skills transfer plan covering (a) and (b) of the above, with Learning Outcomes, time frames and the objectives</p> <p>3 = A skills transfer plan covering (a) and (b) of the above, with Learning Outcomes, and the objectives</p> <p>2 = A skills transfer plan with one of the above, with Learning Outcomes, and the objectives</p> <p>1 = No skills transfer plan provided or skill transfer plan covering (a) and (b) of the above, without Learning Outcomes, and the objectives.</p>
<p>TOTAL FOR FUNCTIONAL PRE-QUALIFICATION CRITERIA.</p>	<p>100</p>	
<p>B. Price</p>	<p>80</p>	
<p>C. BBBEE Status Level Contribution</p>	<p>20</p>	
<p>TOTAL</p>	<p>100</p>	

APPENDIX A: DETAILED SPECIFICATIONS

A.1. Drive Test Equipment

The solution with twenty-four (24) User Equipment (UEs) that can be setup to conduct measurements in 2G/3G/4G/5G/ Wi-Fi mode.

- 1.Number of User Equipment is at least 24
- 2.UEs support technologies: 2G/3G/4G/5G/ Wi-Fi in South Africa
- 3.UEs must be mounted on a Chassis with a control Unit or UEs are mounted in Probes, GPS tracking provided.
- 4.The mounted car drive test system can be powered from a 12 V Car battery
- 5.The must have capability for local and remote configuration e.g., stop and start measurements, load scripts
- 6.Dashboard for real-time local and remote monitoring of measurements including actual route trail and measurement events
- 7.Provision of a 12 V to 240 V Inverter
- 8.All support for software/hardware required for the proper functioning of the system shall be valid for three (3) years after system acceptance.
- 9.The supplier shall install the QoS Drive Test system in the vehicle

A.2. Walk Test Equipment (Backpack)

- 1.Number of User Equipment is at least 12
- 2.UEs support technologies: 2G/3G/4G/5G/ Wi-Fi in South Africa
- 3.UEs can be used in a Walk Test (carried in a backpack) for indoor and outdoor environments
- 4.UEs are powered from their own battery source (e.g., internal device battery)
- 5.Local and remote configuration e.g., stop and start measurements, load scripts
- 6.Dashboard for real-time local and remote monitoring of measurements including actual route trail and measurement events

A.3. Post Processing Tool

- 1.The processing tool must be able to process logfiles from the following systems, TEMS Symphony, Nemo Autonomous and Nemo Outdoor
- 2.Licence is valid for at least 3 years
- 3.Drill-down ability
- 4.Network Performance Score ETSI TR 103 559
- 5.Excel-based reports
- 6.Interactive web-based dashboards
- 7.Multiformat support
- 8.Customization capabilities
- 9.Full automatic benchmarking reports generation

A.4. Scanner

1 x Scanner that can support 5G NR, LTE (FDD and TDD), LTE-LAA, NB-IoT, UMTS/WCDMA, CDMA, EV-DO, GSM, Wi-Fi, P25, DMR, TETRA technologies with scanning capability of 10 MHz - 6 GHz frequencies, including layer 3 decoding.

A.5. Server

Intermediate server for remote test set up, data storage and system function configuration.

- 1.Rack Mount (1 or 2U)
- 2.Dual Power supplier
- 3.Must have at least 2x 10/25 GB ports Adaptor
- 4.2x 10GB BASE-T Network Adapter
- 5.Minimum of 64 GB RAM
6. 2 x Intel Xeon-Silver 4215R (3.2GHz/8-core/130W) Processor (2nd Generation or latest)
7. 2 x Disk Drive 480GB SATA 6G Read Intensive M.2 2280 5300P SSD (for OS)
8. 2 TB minimum storage capacity