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Appointment of a service provider for the supply and delivery of a new network performance monitoring system for quality of service monitoring (QoS) for a period of Five (5) years on an 80/20 PPPFA 2000, Preferential Procurement Regulation: 2017.

1. Purpose of Request for proposal

The purpose of this proposal is to invite the eligible service provider for the supply and delivery of a new network performance monitoring system for quality of service monitoring (QoS) for a period of Five (5) years on an 80/20 PPPFA 2000, Preferential Procurement Regulation: 2017 .

2. Background

2.1 ICASA is mandated to regulate broadcasting, electronic communications and postal matters in the public interest and to achieve the objects set out in the underlying statutes in terms of section 2 of the ICASA Act No. 13 of 2000 ("the ICASA Act").

2.2 Quality of Service (QoS) can be described as the ability of a network to provide a service at an assured service level. QoS is very critical in mobile communication networks technologies including second generation (2G/GSM), third generation (3G/WCDMA) and fourth generation (4G/LTE) systems.

2.3 Engineering and Technology division's strategic objective (SO 4.1) is to protect the rights of consumers by promoting the delivery of quality of services to consumers and other stakeholders by 2019/20. The Authority in the past promulgated a regulation for the monitoring of the Quality of Service levels offered by the operators. The regulations are the End-user subscriber service

charter regulations. These regulations were found to have several limitations in the implementation of punitive measures.

2.4 Regulation 9 (6) of End-User and Subscriber Service Charter Regulations - April 2016 states that A licensee must submit a compliance report to the Authority in respect of the parameters as listed in sub-regulation 5, twice annually. The Authority has no means or methods of verifying these compliance reports. The limitations are attributed to the applied measurement methods of drive testing tools that ICASA has adopted. ICASA adopts an active benchmarking monitoring methodology, which makes it impossible to regulate. A passive 24/7/365 methodology is the latest mechanism, available to regulators to obtain QoS measurements.

2.5 The Authority currently use a drive-test method to measure the QoS. This may not represent the average of user's locations over the whole network but gives a snap-shot in time and location of the performance of the network. As the real traffic provides measurements from the entire network, all the different locations and different times are measured, so the representativity is assured [ETSI EG 202 057-3 V1.1.1]. A combination of both the drive-test method and the passive Network Performance Monitoring system will cater for all four viewpoints of QoS [Rec. ITU-T E.800].

2.6 The objective of this project is to verify the network performance by a use of Network Performance Monitoring System (NPMS), to identify issues in each specific network and analyse the root causes.

2.7 The Authority invites an Open-bid with proposals from eligible service providers for a passive Network Performance Monitoring System to collect data and give reports from the Mobile Network Operators (MNOs) in the country.

3. Specifications/Terms of reference

ICASA intends to appoint a service provider to supply, install and commission a Network Performance Monitoring system. The system shall be multivendor, multi-technology and meet the general requirements as specified in the Appendix A.

3.1. Hardware, Documents and Training

The scope of work entails the following deliverables:

Table 1 Project Deliverables

ITEM NUMBER	BRIEF DESCRIPTION	QUANTITY
	Hardware and Software	
1	Fixed QoS Network Performance Monitoring System (with all supporting hardware , software, licences and databases) . Break down as follows: 1. NPMS Application Software 2.FTP/SFTP Server x 4 (1 per Operator) 3.Supporting software and licenses 4.Two laptops (*See Appendix A for specifications*) **Note:***The supplier shall provide NPMS Server specifications to ICASA. The NPMS server, storage and backup to be procured and handled via ICASA IT department processes. ICASA to provide virtual dedicated links (e.g FTP/SFTP sufficient link from Operators to ICASA Head Office)*	
	Documentations	
2	Hardcopies of the Quality of Service and Network Performance Monitoring System operational manuals	1
3	Electronic version of the Quality of Service and Network Performance Monitoring System operational manuals	2
4	Electronic version of Quality of Service and Network Performance Monitoring System software manuals	2
5	**Support**	
	Provide support for the duration (five years) of the of the project	
	Training	
6	Provide full training to 10 staff members of ICASA	

3.2. Network Architecture and configuration

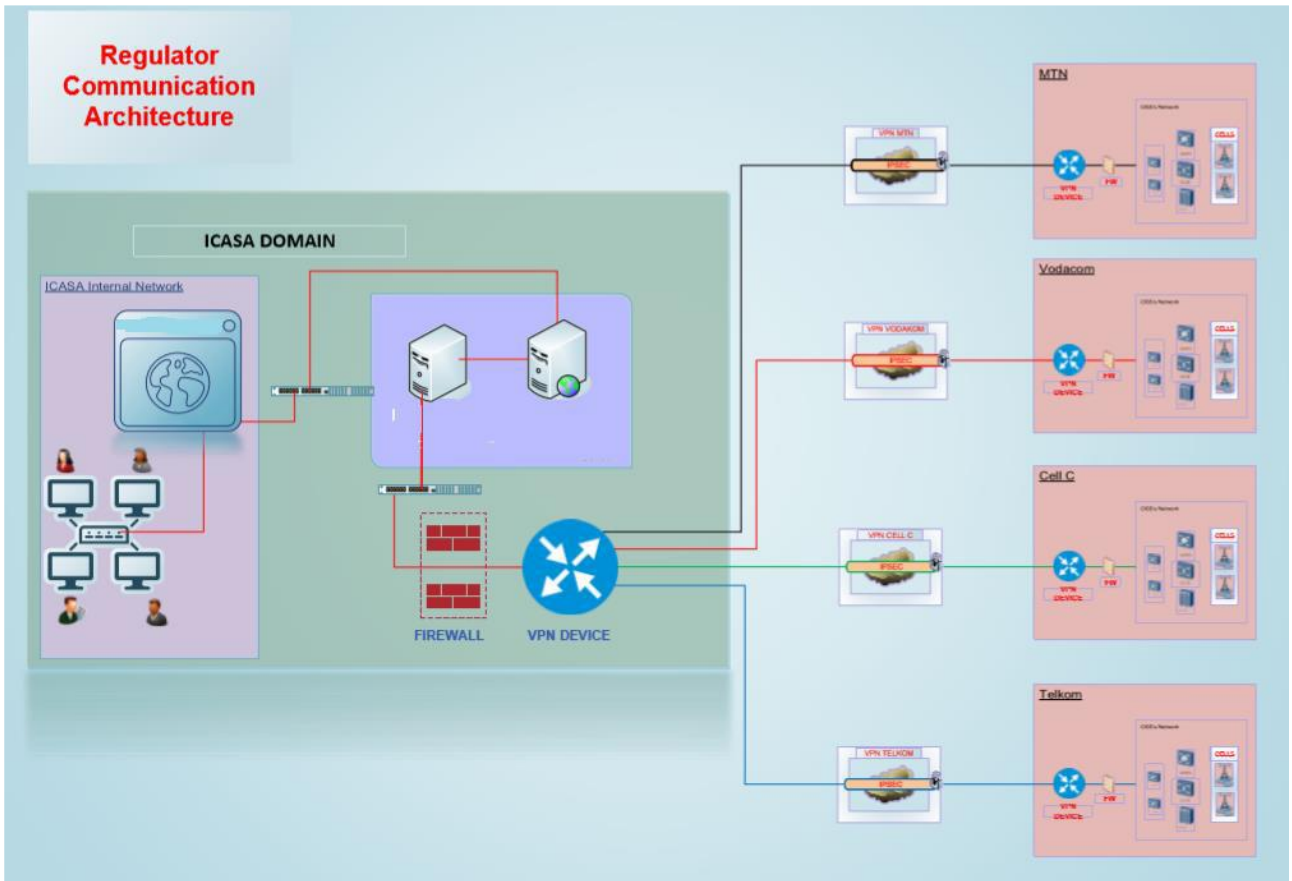

Figure 1: Set up and connection of the FTP/SFTP servers to centralized server

The proposed Network Performance Monitoring system shall:

- Collect/extract raw files/data from each operator (Cell C, MTN, Telkom and Vodacom)
- Process/transform collected files/data
- Load the processed data into a database

The system needs to be configured with performance-management alarms in response to service degradation in breach of license conditions. The following will be configured:

3.2.1. Perform integrity and reliability checks of OMC-R/source raw data on trial.

3.2.2. Report customization: Configure automatic email alert on network events (align with service affecting incidences).

3.2.3. Perform access control configurations (administrator profile and general users profile (priority and non-priority) to ensure maximum security.

ICASA and the service provider will conduct a Provisional Acceptance Testing (PAT) of the system. A PAT is a test conducted to determine if the requirements of a specification or contract are fulfilled.

3.3. Operators, Vendors and Technology

The state of the South African mobile networks is given in Table 2, the dimensioning of the servers and configuration has to be calculated according to the size of the network data to be transmitted to ICASA, while anticipating the possible future network expansion or addition of new Radio Access Technologies (4G for example) by the MNOs.

3.4. Product Support and Licensing

3.4.1. The supplier shall have proven capacity to timely maintain, repair and replace all components of the system.

3.4.2. Local presence in South Africa will be critical, as we require service in shorten lead times.

3.4.3. The supplier shall have an online portal for logging of faults and complaints and may supplement this portal with other reporting platforms.

3.4.4. The bidder must state the manufacturer's end of support for this solution, which shall not be less than 3 years from date of acceptance.

3.4.5. The bidder shall provide the licences to be used,remote upgrades of software and any installation of software patches. Licences must be valid for at least 3 years from installation of the system.

3.4.6. The bidder must state any third party or supplier they are involved with in supplying the sollution.

3.5. Guarantee and Warranty

The supplier shall provide a guarantee and/or warranty of at least one year, both of which must be issued by the equipment manufacturer. The guarantee and warranty periods should not be concurrent. The manufacturer must provide confirmation at the time of bidding of full guarantee and warranty including but not limited to:

- After sales support and maintenance by the system/solution manufacturer
- Any spare parts required.

4. Period of assignment

The period of the project/ assignment is five (Five) years.

5. Briefing Session

There will be a non-compulsory briefing session on Monday the 4th of February 2019

6. Bid evaluation

The bid will be advertised for a period of 21 working days in the Government Tender Bulletin on an 80/20 procurement principle.

Bidders will be evaluated on; a) submission of the required documents, b) functionality and c) price/bb-bee. Only bidders who meet the cut-off score of 70 points out of 100 points for functionality will be considered further for price and BBBEE evaluation. Bidders who meet the cut-off score of 70 points out of 100 points for functionality will be also be required to provide a live demonstration of how their system works. All bid proposals submitted will be evaluated in accordance with the 80/20 procurement principle as prescribed by National Treasury Regulations.

Table 2 Evaluation criteria

No	Category	Weight
A.	**Functionality: Pre-qualification criteria**	
1.	Detailed project plan, e.g. preparation, execution and control.	**20**
2.	Proof of delivery of Documentations and manuals, sample reports and adhering to international acceptable standards (ITU, SABS, ETSI) and practises	**10**
3.	Functional demonstration of the system's capabilities: ➢ General requirements (20%) ➢ Technical Parameters/KPIs to be monitored (15%) ➢ Special reporting requirements (15%)	**50**
4.	Provide at least 3 testimonial references of existing Network Performance Measurements system that are currently operational, including sample report.	**5**
5.	Provide clear skills transfer plan for ten (10) ICASA staff members with timeframes.	**10**
6	Support and Local presence	**5**
	TOTAL FOR FUNCTIONAL PRE-QUALIFICATION CRITERIA.	**100**

1. General Requirements

The Quality of Service and Network Performance Monitoring System shall:

1. Be modular, flexible and easy to upgrade as well as to add extra interfaces. It should be possible to start the system with a basic configuration allowing for extension at any time when the need arises. New system components shall be easy to integrate. Supplier shall also ensure that highly specialized modules for specific new tasks are available when so required e.g. for the analysis of new mobile system technologies from the IMT family.
2. Be tried and tested: Potential system suppliers should provide corresponding reference lists of Administrations using the proposed system.
3. Have fixed module(s) capable to communicate and collect raw data from OMC-R or data source from all Mobile Network Operators (MNOs) to a central server;
4. Have the capability to record, analyze, calculate KPIs and create reports;
5. Be capable to determine impairment of the quality of service in facilities within;
6. Be able to determine the traffic load on BTSs in terms of the serving radio resources to determine service accessibility;
7. Have an enforcement and compliance module that tracks the KPIs of the BSS network nodes against predefined ICASA's thresholds (target and limit values)
8. Have a database to store all records. The database should be easy to interface with other databases, with database requirements such as licences and fees declared upfront;
9. Be able to work with various vendors (compatible with most vendor equipment of operators);
10. Have a module that verifies the integrity and reliability of the OMC-R or source data before it undergoes processing.
11. GIS Exports form the monitoring system must be compatible with third party mapping software such as Google earth or Bing maps.
12. Be capable and flexible enough for users to creating new KPIs from network counters.

13. Be able to work with multiple technologies: 2G, 3G, 4G (GSM, CDMA, WCDMA, and LTE etc.) and operating spectrum bands. (700 MHz to 2600 MHz)
14. Be able to simulate theoretical radio coverage of BTSs, Node-Bs or eNode-Bs.
15. Must have network fault incidence reporting capability. In essence, it should be capable of tracking worst cells.
16. Offer the possibility to correlate Processed Drive test Data with OMC-R/source Data on same platform or separately.

2. Technical Parameters/ Key performance indicators (KPIs):

The System shall have the capability to monitor significant events related to QoS KPIs, as prescribed in the ICASA's "End-User and Subscriber Service Charter regulations of 2016" and SABS's "SANS 1725" but not limited to the following mandatory mobile voice and data communications basic parameters KPIs:

1. Stand-alone Dedicated Control Channel (SDCCH) Blocking Rate: Blocking rate for SDCCH channel (congestion).
2. Traffic Channel (TCH) Blocking Rate: Blocking rate for Traffic channel (congestion).
3. Traffic Channel (TCH) Assignment success rate: Rate for assignment and access to TCH channel (otherwise problem due to congestion).
4. Call Setup Time or Voice Service Access Delay: Measure of time it takes for the user equipment to set up a call.
5. Call Setup Success Rate (CSSR): Number of the unblocked call attempts divided by the total number of call attempts. Or (1 - Blocking Probability) x 100%. A call setup is an exchange of signalling information in the call process that leads to Traffic Channel (TCH) seizure.
6. Call Drop Ratio (CDR): The Call Drop Rate is the number of dropped calls divided by the total number of call attempts. Call Completion Rate (CCR) / Call Success Rate (CSR): The CCR is the ratio of successfully completed calls to the total number of attempted calls. That is, the ratio of the number of completed call attempts to the total number of call attempts, at a given point of a network. A complete call is a call that is released by normal call clearing (i.e., Released Message) either by the caller or called pa Handover Success Rate: This is the ratio of the number of successfully completed

handovers to the total number of initiated handovers. This ratio can be expresses as a percentage.

7. Data Service Availability: This is numerical measure of the service uptime on a data network given that network resources for the service are available and functional. Data Service Availability = Service Uptime (hrs) / [Service Downtime (hrs) + Service Uptime (hrs)]
8. Data Service Access Time: Is a measure of the time lapse in activating a PDP Context for data service.
9. Data Service Access Rate: Is the probability of success in connecting to the carrier networks whilst attempting to access a public network
10. Data Service Drop Rate: Is the ratio of the number of dropped data sessions to the successful data service attempts made to a public server over the carrier's network.
11. DL Average User Throughput: Downlink throughput as provided to the user connected data resources on either a 2G/3G/4G network and is defined as the rate of data transfer (in Mbps)
12. Radio Resource control (RRC) Blocking rate: This is failure rate to allocate radio resources to the UE due to capacity issues or interference issues.
13. Radio Access Bearer (RAB) Blocking rate: This is failure rate to grant access to bearer usually linked to congestion in a given network.

2. Special Reporting requirements

1. Report Generation and Presentation: The supplier shall supply the software, which shall include modules for user defined report-generation and for graphic result display.
2. The system should allow both the user and the supplier to tailor the ready-made and regular reports with ease. The supplier shall submit the specification of regular, readymade report formats for the various QoS monitoring parameters.
3. The supplier should provide information about the tools and the support towards the design of new report and graph formats (templates, user-friendly dialog and dynamic help, etc.)
4. The supplier should provide a list of the ready-made, regular QoS analysis reports that will be supplied, together with the pertinent specifications, application contexts and descriptive sample sheets.

5. The supplier should provide for varied report formats that are relevant to all the measurement parameters. The reports shall take into account the user defined parameter thresholds and the measured values, giving a clear indication of performance against these thresholds.

1. Laptop Specifications

The specifications are a guideline to be used for laptops required.

System features

Operating system:

Windows 10 Pro 64

Processor family:

7th Generation Intel® Core™ i7 processor

Processor:

Intel® Core™ i7-7600U vPro™ processor with Intel® HD Graphics 620 (2.8 GHz base frequency, up to 3.9 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)

Intel® Core™ i7-7500U with Intel® HD Graphics 620 (2.7 GHz base frequency, up to 3.5 GHz with Intel® Turbo Boost Technology, 4 MB cache, 2 cores)

Chipset:

Chipset integrated with processor

Memory

Maximum memory:

32 GB DDR4-2133 SDRAM

Display and graphics

Display:

35.56 cm (14") diagonal HD SVA anti-glare slim LED-backlit with camera (1366 x 768)

35.56 cm (14") diagonal FHD SVA anti-glare slim LED-backlit with camera (1920 x 1080)

Graphics:

Integrated Intel® HD Graphics 620

Expansion features

Ports:

2 USB 3.1 Gen 1 (1 charging)

1 USB Type-C™

1 DisplayPort™ 1.2

1 VGA

1 RJ-45

1 docking connector

1 headphone/microphone combo

1 AC power

Expansion slots:

1 SD

1 external SIM

Communication

Network interface:

Intel® Ethernet Connection I219-V

Intel® Ethernet Connection I219-LM

Wireless

HP lt4120 Qualcomm® Snapdragon™ X5 LTE Mobile Broadband Module

Intel® Dual Band Wireless-AC 8265 802.11 a/b/g/n/ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo (vPro™ and non-vPro™)

Accessories and Services

Hardware support with accidental damage protection