



TELECOM REGULATORY AUTHORITY OF INDIA

**Expression of Interest
(EOI)**

for

**Random real time monitoring and
Audit & Assessment of Quality of Service of
Service Providers**

4th February 2012

**Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhavan
Jawahar Lal Nehru Marg (Old Minto Road)
New Delhi – 110 002**

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SECTION-I

Notice inviting Expression of Interest for random real time monitoring and Audit & Assessment of Quality of Service of different service providers

1. Telecom Regulatory Authority of India (hereinafter referred to as TRAI), Mahanagar Doorsanchar Bhavan, Jawahar Lal Nehru Marg (Old Minto Road), New Delhi – 110002 invites Expression of Interest (EOI) from companies/firms/vendors (hereinafter referred to as Bidders) for planning, designing, development, implementation and maintenance of a system for random real time monitoring of quality of service of different service providers through simulating actual user activity; and audit and assessment of quality of service; in terms of the benchmarks specified in the “Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated 20th March, 2009” and Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6th October, 2006 on License Service Area (LSA)/ Zonal basis.

2. The Zones shall comprise of the following Telecom Circle/Metro Service Areas.

North Zone: Delhi, Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Uttar Pradesh-East and Uttar Pradesh-West (including Uttarakhand). (For Cellular Mobile Service, the service area of Delhi includes Ghaziabad, Faridabad, Noida and Gurgaon).

South Zone: Chennai, Andhra Pradesh, Karnataka, Tamilnadu (excluding Chennai) and Kerala.

West Zone: Mumbai, Maharashtra (including Goa and excluding Mumbai), Gujarat and Madhya Pradesh (including Chattisgarh).

East Zone: Kolkata, West Bengal (including Andaman & Nicobar, Sikkim and excluding Kolkata), Bihar (including Jharkhand), Orissa, Assam and North East which includes Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Manipur and Tripura.

3. The proposal in sealed cover, as per the prescribed formats given at Section IV and complete in all respects, should be submitted to **Joint Advisor (QOS), Telecom Regulatory Authority of India, Mahanagar Doorsanchar Bhavan, Jawahar Lal Nehru Marg (Old Minto Road), New Delhi – 110002, not later than 3.00 PM on 27.02.2012.**

The proposals, received by the closing of time for receiving proposals, will be opened in the presence of representatives of bidder(s) who wish to be present **at 4.00 PM on 27.02.2012** in the office of TRAI.

**Signature of Authorized
Signatory**

SECTION-II

Instructions to prospective Bidders

1. Background

1.1 Telecom Regulatory Authority of India has vide its the Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated 20th March, 2009 published in the Gazette of India Extraordinary Part-III-Section 4 dated 23rd March, 2009, laid down the 'Quality of Service' parameters applicable to the Basic Telephone Service (wireline) and Cellular Mobile Telephone Service. A copy of the said regulations is available at TRAI's website www.trai.gov.in and may be referred. These regulations are applicable to all the Basic Service Operators/ Unified Access Service Providers and Cellular Mobile Telephone Service providers, including BSNL and MTNL.

1.2 Telecom Regulatory Authority of India has vide its Quality of Service for Broadband Service Regulations, 2006 dated 6th Oct. 2006 (11 of 2006) published in the Gazette of India Extraordinary Part-III-Section 4 dated 10th Oct. 2006, laid down the 'Quality of service' parameters applicable to the broadband services. A copy of the said regulations is available at TRAI's website www.trai.gov.in and may be referred to. These regulations are applicable to all the Internet Service Providers, Basic Service providers, Unified Access Service Providers and Cellular Mobile Telephone Service Providers including BSNL and MTNL providing broadband services.

1.3 S.N. (i) to (xii) under sub-regulation (1) of regulation 3, pertaining to Basic Telephone Service (wireline), and S.No. (i) to (x) under sub

regulation (1) of regulation 5, pertaining to Cellular Mobile Telephone Service, of the Standards of Quality of Service of Basic Telephone Service(Wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated the 20th March, 2009, and Sl (i) to (viii) of regulation 3 of Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) contain the benchmarks for the parameters on Quality of Service to be achieved by the service providers.

2. Aim

The aim of this EOI is to invite technical proposals from reputed bidders for (i) implementation of random real time monitoring of various parameters/Key Performance Indicators (KPIs) for assessing quality of service provided by the operators for Cellular Mobile Services and for Broadband Services (Optional, at the discretion of TRAI), on managed services basis. (ii) audit and assessment of Quality of Service of service providers for Basic Telephone Services, Broadband and Cellular Mobile Services so as to shortlist all technically qualified bidders for issuing tender bid document for these services.

3. Clarification of EOI document

3.1 A copy of this EOI is available at TRAI's website www.trai.gov.in and may be downloaded for submission purpose. The request for any clarification, if needed, shall be submitted in writing but not later than 4.00 PM of 17.02.2012 days (as specified in clause 8) to Joint Advisor (QoS), Telecom Regulatory Authority of India, 5th Floor, Mahanagar Doorsanchar Bhavan, Jawaharlal Nehru Marg (Old Minto Road), New Delhi-110 002. Copies of the query (without identifying the source) and clarifications by TRAI shall be uploaded on the website of TRAI not later than 21.02.2012.

3.2 Any clarification issued by TRAI in response to a query raised by prospective bidders shall form an integral part of EOI and it may amount to an amendment of relevant clauses of EOI document.

3.3 The bidders are required to keep a watch on TRAI's Website www.traigov.in for any amendment to EOI or for clarifications in response to the queries raised by the Bidders up to a day prior to the last date for submission of bids. TRAI reserves the right to reject any bid if the bid is submitted without taking into accounts the said amendments/clarifications. Further, the prospective bidders shall be fully responsible for downloading of the amendments, if any made in the EOI document and clarifications, if any, issued by TRAI and TRAI accepts no responsibility whatsoever in this regard.

4. Terms of Reference

The Terms of Reference for assessment of Quality of Service provided by service providers is given in **Section-III**.

5. Technical Proposal

Standard formats for technical proposals are given in **Section-IV**. All the necessary information as sought in this EOI are required to be provided by the Bidder and submitted before the last date and time of submission. The Bidders may submit the proposal as a consortium for this purpose or in joint venture with another agency.

6. Last date (due date) for submission of bids

The bid should be submitted not later than **03.00 PM** on 27.02.2012. Any bid received after the specified date shall be rejected and returned unopened to the bidder.

7. TRAI's right to accept or reject a bid without assigning any reason

TRAI reserves the right to accept or reject any bid without assigning any reason.

8. The important dates with reference to this EOI are given below:

- | | |
|---|------------|
| 1. The date of floating of EOI: | 4.02.2012 |
| 2. Last date for seeking clarification: | 17.02.2012 |
| 3. Last date for submission of EOI: | 27.02.2012 |

9. Evaluation of EOI.

9.1 The technical bids will be evaluated based on technical solution/ proposal submitted by the bidder. The bidder is required to provide the following information/ documents along with the technical bid, namely:-

- (i) a brief note indicating how the bidder is equipped to perform the task, particularly their manpower and infrastructure capability;
- (ii) past experience of bidder in undertaking works of similar nature as given in section-IV;

9.2 The bidders may be called to make presentation to EOI evaluation committee constituted for this purpose. The bidder shall make the presentations and shall furnish the clarifications/detailed explanations, if any, sought on the technical proposals by TRAI or EOI evaluation committee. The bidders may be required to demonstrate their solution with sample field deployment. All bidders who are found to be technically qualified shall be issued tender bid document for the work.

10. Indemnity

In no event shall TRAI be liable to bidder for special, direct, indirect or any other damages in connection with or arising out of the performance or use of services provided by the bidder under this EOI. The bidder shall indemnify TRAI in respect of any damages, claim, loss or action against TRAI for any act of commission or omission on the part of the bidder, its agents or servants.

11. Coordination

11.1 The bidder shall appoint one of its employees as coordinator who shall represent the bidder in all dealings with TRAI.

11.2 All correspondence relating to EOI shall be addressed to Joint Advisor (QOS), Telecom Regulatory Authority of India, Mahanagar Doorsanchar Bhavan, New Delhi-110 002.

12. Confidentiality

All information gathered during the real time monitoring and assessment of Quality of Service and reports submitted to TRAI will be the sole property of TRAI. The bidder will not transfer / pass on the information of one service provider to another service provider or to any third party under any circumstances. Further, by signing this EOI document, the bidder confirms that he shall not disclose any information contained in this document or part thereof to any third party without prior written consent of TRAI.

13. Jurisdiction of courts

The courts located at New Delhi/Delhi shall alone have the jurisdiction to decide any dispute arising out of this EOI, the tender document to be issued to a bidder found technically qualified upon

evaluation of EOI and agreement which may be entered into by TRAI with the Bidder.

14. Arbitration

In the event of any dispute arising between TRAI and the bidder, the matter shall be referred to the Secretary, TRAI who may himself act as sole arbitrator or may name as sole arbitrator an officer of TRAI notwithstanding the fact that such officer has been directly or indirectly associated with EOI process or the agreement signed between the parties. The bidder shall not be entitled to raise any objection to the appointment of such officer of TRAI as the sole arbitrator. The award of the arbitrator shall be final and binding on both the parties, subject to the provisions of the Arbitration and Conciliation Act, 1996 and rules made thereunder for the time being in force. The parties expressly agree that the arbitration proceedings shall be held at New Delhi. The language of arbitration shall be English.

15. Language of the bid:

The bid shall be submitted in the English language.

Signature of Authorized Signatory

SECTION-III

TERMS OF REFERENCE FOR RANDOM REAL TIME MONITORING, AUDIT AND ASSESSMENT OF QUALITY OF SERVICE OF DIFFERESNT SERVICE PROVIDERS

1. Objective:

1.1 Telecom Regulatory Authority of India has been entrusted to lay-down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical audit of such services provided by the service providers so as to protect the interest of the consumers of telecommunications service.

1.2 The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service, Regulations, 2009 (7 of 2009)” dated 20th March, 2009 and Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6th October, 2006 specify benchmarks for the parameters on Quality of Service (QoS) to be achieved by service providers. The objective of the Terms of Reference is to monitor various parameters of quality of service on real-time basis. The bidder should propose the solution that will empower TRAI to ensure that the QoS parameters as laid down by TRAI are met by various service providers.

1.3 For this purpose, TRAI wants to engage an agency on zonal basis for (i) implementation of random real time monitoring of various parameters/Key Performance Indicators (KPIs) for assessing quality of service provided by the operators for Cellular Mobile Services and for Broadband Services (Optional, at the discretion of TRAI), on managed services basis.

(ii) audit and assessment of Quality of Service of service providers for Basic Telephone Services, Broadband and Cellular Mobile Services .

The bidders shortlisted after technically qualified will be issued the tender bid document for these services.

1.4 The scope of work includes:

1.4.1 Supply and installation of Virtual subscriber probes at different locations so as to meet the EoI requirements.

1.4.2 Moving these probes so as to cover the desired number of BTS' in accordance with the requirements.

1.4.3 Drive test of the RF networks.

1.4.4 Preparation of Performance Monitoring reports (PMRs) and loading in the system.

1.4.5 Live measurements of the performance of Service Providers (SPs) against the benchmarks for three days.

1.4.6 Monthly audit based on one month data of the SPs.

1.4.7 Random customer feedback by calling the customers towards feedback of the services of the SPs.

1.5 S. No. (i) to (xii) of regulation 3 pertaining to Quality of Service (QoS) parameters for Basic Telephone Service, S. No. (i) to (x) of regulation 5 pertaining to QoS parameters for Cellular Mobile Telephone Service of the Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated the 20th March, 2009 and S. No. (i) to (viii) of regulation 3 of Quality of Service of Broadband service Regulations, 2006 (11 of 2006) contain the parameter and benchmarks of the Quality of Service to be achieved by the service providers.

1.6 The parameters for Basic Telephone Service (Wireline) consist of various QoS indicators, which can be audited and assessed objectively.

The list contains parameters like fault incidences, call completion rates/answer to seizure ratio, POI congestion and customer service parameters viz. mean time to repair faults, metering and billing credibility (post paid and pre paid), resolution of billing/charging complaints, period of applying credit/waiver/adjustment to customer's account, response time to the customer for assistance, termination/closure of service, time taken for refund of security deposit after closures; provision of a telephone after registration of demand, shift of telephone connection, etc.

1.7 The parameters of Quality of Service for cellular mobile telephone services are specified under the head (A) Network Service Quality Parameters (B) Customer Service Quality Parameters. The Network Service Quality Parameters include the parameters related to (i) Network Availability (ii) Connection Establishment, (iii) Connection Maintenance (iv) POI Congestion. The Customer Service Quality Parameters include metering and billing credibility (post paid and pre paid), resolution of billing/charging complaints, period of applying credit/waiver/adjustment to customer's account, response time to the customer for assistance, termination/closure of service and time taken for refund of security deposit after closures. The parameter related to the Service coverage is to be audited and monitored during drive test.

1.8 The parameters of Quality of Service for broadband services, specified in the regulation 3 of Quality of Service of Broadband Services Regulations, 2006, include service provisioning/activation time, fault repair and restoration time, billing performance, response time to customer for assistance, bandwidth utilization / throughput, service availability, packet loss and network latency.

1.9 The bidders are not restricted to the above Quality of Service parameters and any new additional parameters / KPIs for assessment of quality of service may be incorporated, with proper justification.

1.10 TRAI may modify the above parameters and benchmarks and may also add new parameters from time to time during the currency of contract and the bidder shall be bound by it.

1.11 The detailed explanation and measurement methodology of each parameters and benchmarks for Basic Telephone Service (Wireline), Cellular Mobile Telephone Service and Broadband Service are given in the Explanatory Memorandum of the regulations mentioned in Clause 1.2. The parameters, whose data is to be monitored, verified and audited, but not limited to, are as follows:

(i) Cellular Mobile Telephone Service:

Serial Number	<i>Name of Parameter</i>	Benchmark	Averaged over a period
A	Network Service Quality Parameters:		
(i)	Network Availability		
	(a) BTSs Accumulated downtime (not available for service)	$\leq 2\%$	One Month
	(b) Worst affected BTSs due to downtime	$\leq 2\%$	One Month
(ii)	Connection Establishment (Accessibility)		
	(a) Call Set-up Success Rate (within licensee's own network)	$\geq 95\%$	One Month
	(b) SDCCH/ Paging	$\leq 1\%$	One Month

	Channel Congestion		
	(c) TCH Congestion	$\leq 2\%$	One Month
(iii)	Connection Maintenance (Retainability)		
	(a) Call Drop Rate	$\leq 2\%$	One Month
	(b) Worst affected cells having more than 3% TCH drop (call drop) rate	$\leq 5\%$ upto 31.03.2011 $\leq 3\%$ From 01.04.2011	One Month
	(c) connections with good voice quality	$\geq 95\%$	One Month
(iv)	Point of Interconnection (POI) Congestion (on individual POI)	$\leq 0.5\%$	One Month
B	Customer Service Quality Parameters:		
(v)	Metering and billing credibility – post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle	One Billing Cycle
(vi)	Metering and billing credibility -- pre-paid	Not more than 1 complaint per 1000 customers i.e. 0.1% complaints for metering, charging, credit, and validity	One Quarter
(vii)	(a) Resolution of billing/ charging complaints	100% within 4 weeks	One Quarter
	(b) Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
(viii)	Response Time to the customer for assistance		

	(a) Accessibility of call centre/ customer care	≥ 95%	One Quarter
	(b)Percentage of calls answered by the operators (voice to voice) within 60 seconds	≥ 90%	One Quarter
(ix)	Termination/ closure of service	≤ 7 days	One Quarter
(x)	Time taken for refund of deposits after closures	100% within 60 days	One Quarter

(ii) Basic Service (wireline):

Serial Number	Name of Parameter	Benchmark	Averaged over a period
(i)	Fault incidences (No. of faults/100 subscribers /month)	≤ 5	One Quarter
(ii)	Fault repair by next working day	<p>For urban areas: By next working day: ≥ 90% and within 3 days: 100%.</p> <p>For rural and hilly areas: By next working day: ≥ 90% and within 5 days: 100%.</p> <p>Rent Rebate Faults pending for >3 days and ≤7 days: Rent rebate for 7 days. Faults pending for >7 days and ≤15 days: Rent rebate for 15 days. Faults pending for >15 days: rent rebate for one</p>	One Quarter

		month.	
(iii)	Mean Time To Repair (MTTR)	≤ 8 Hrs	One Quarter
(iv)	(a) Call Completion Rate within a local network shall be better than	≥ 55%	One Quarter
	or, (b) Answer to Seizure Ratio (ASR)	≥ 75 %	One Quarter
(v)	Point of Interconnection (POI) Congestion (on individual POI)	≤ 0.5%	One month
(vi)	Metering and billing credibility – post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle	One Billing Cycle
(vii)	Metering and billing credibility -- pre-paid	Not more than 1 complaint per 1000 customers, i.e., 0.1% complaints for metering, charging, credit, and validity	One Quarter
(viii)	Resolution of billing/charging complaints	100% within 4 weeks	One Quarter
(ix)	Period of applying credit/waiver/adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
(x)	Response Time to the customer for assistance		
	(a) Accessibility of call centre/ customer care	≥ 95%	One Quarter
	(b)Percentage of calls answered by the operators (voice to voice) within 60	≥ 90%	One Quarter

	seconds		
(xi)	Termination/ closure of service	≤ 7 days	One Quarter
(xii)	Time taken for refund of deposits after closures	100% within 60 days.	One Quarter

(iii) Broadband Service:

S.N	Parameters	Benchmark
(i)	Service Provisioning/ Activation time	100% cases in ≤15 working days (subject to technical feasibility). In all cases where payment towards installation charge & security deposit is taken and the Broadband connection is not provided within 15 working days, a credit at the rate of Rs.10/ per day, subject to a maximum of installation charge or equivalent usage allowance shall be given to the customer, at the time of issue of first bill.
(ii)	Fault Repair/ Restoration Time	By next working day: > 90% and within 3 working days: 99% Rebate: (a) Faults Pending for > 3 working days and < 7 working days: rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance (b) Faults Pending for > 7 working days and < 15 working days: rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance (c) Faults Pending for > 15 working days: rebate equivalent to one month of minimum monthly charge or equivalent usage allowance

(iii)	<p>Billing Performance</p> <ul style="list-style-type: none"> • Billing complaints per 100 bills issued • %age of Billing Complaints resolved • Time taken for refund of deposits after closure: 	<p>< 2%</p> <p>100% within 4 weeks</p> <p>100% within 60 days</p>
(iv)	<p>Response time to the customers for assistance</p>	<p>% age of calls answered by operator (Voice to Voice)</p> <p>Within 60 seconds > 60%</p> <p>Within 90 seconds > 80%</p>
(v)	<p>Bandwidth Utilization/ Throughput:</p> <p>a) Bandwidth Utilization</p> <p>i) POP to ISP Gateway Node [Intra-network] Link(s)</p> <p>ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity</p> <p>b) Broadband Connection Speed (download)</p>	<p><80% link(s)/route bandwidth utilization during peak hours (TCBH). If on any link(s)/route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.</p> <p>Subscribed Broadband Connection Speed to be met >80% from ISP Node to User.</p>

(vi)	Service Availability / Uptime	> 90% quarter ending June 2007; > 98% with effect from quarter ending September 2007 and onwards
(vii)	Packet Loss	<1%
(viii)	<p>Network Latency (for wired broadband access)</p> <ul style="list-style-type: none"> • User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI) <120 msec • User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial) <350 msec • User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) <800 msec 	

2. Scope of work:

2.1 The main purpose of the Expression of Interest is to monitor the Quality of Service rendered by the service providers providing Cellular Mobile Telephone Service and Broadband Service on the basis of random real time monitoring by simulating actual user activity and audit and

assessment of Quality of service provided by Cellular Mobile Service providers, Basic telephone Service (Wireline) providers and Broadband Service providers.

2.2 The Zones for the purpose of this EOI comprise of the following Telecom Circle/Metro Service Areas:

North Zone: Delhi, Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Uttar Pradesh-East and Uttar Pradesh-West (including Uttaranchal). For the cellular mobile telephone service the service area of Delhi includes Ghaziabad, Faridabad, Noida and Gurgaon.

South Zone: Chennai, Andhra Pradesh, Karnataka, Tamilnadu (excluding Chennai) and Kerala.

West Zone: Mumbai, Maharashtra (including Goa and excluding Mumbai), Gujarat and Madhya Pradesh (including Chattisgarh).

East Zone: Kolkata, West Bengal (including Andaman & Nicobar, Sikkim and excluding Kolkata), Bihar (including Jharkhand), Orissa, Assam and North East which includes Arunachal Pradesh, Meghalaya, Mizorum, Nagaland, Manipur and Tripura.

2.3 The details for implementation of random real time monitoring of various parameters/KPIs for assessing quality of service provided by the operators for Cellular Mobile Services and for Broadband Services (Optional, at the discretion of TRAI), on managed services basis are as given below.

2.3.1 In a tentative network architecture, multiple numbers of Virtual Subscriber/probes/agents/customers may be located at different locations in each of the four zones (North, South, East and West) across

India. At least 1% of the total BTSs in each License service area (Circle) shall be covered over a period of 90 days, where each BTS should be tested for consecutive 3 days. These probes may be either stationary/fixed or moving/nomadic. The probe needs to be moved within the city instead of keeping it stationary in one BTS area, thereby requiring vehicle mounted systems. Some fixed probes may be used to monitor Quality of Service of Broadband services. It may also be possible to use these probes interchangeably or in mixed mode. These agents/probes may be finally connected to Central application/database servers which may be positioned at the premises of TRAI, Delhi or any other location. Each zone may be connected to the central server at TRAI through a multiplexer housed at a centralized location within the zone. These Multiplexers will monitor Quality of service parameters in each of these zones.

2.3.2 The Quality of Service monitoring shall be possible for Cellular Mobile Telephone Service and Broadband Service provided by all the Basic Service providers, Unified Access Service providers, Cellular Mobile Service providers and Internet Service providers (ISPs) (providing broadband service) in various license service areas.

2.3.3 A detailed complete solution giving maps / block diagrams shall be submitted covering all the four zones for all the service providers on a managed service basis. The details about the network elements involved and the architecture, methodology for data collection/generation and storage, elements involved for real time display of entire network status and details of security aspects of the network shall be submitted. The detailed timeframe required for project roll out and implementation shall be submitted. The bidder should also submit the experience details and human resources capabilities required for this project.

2.3.4 The solution shall be capable to cover new services/ applications which shall be introduced in the network of service providers for existing and other technologies like Next Generation Network (NGN), 3G/4G, Broadband Wireless Access (BWA) etc. that are likely to be implemented in the future. The bidder should describe the extensibility features of their solution that will allow the scope of further extension in the future.

2.3.5 The proposed solution shall have a coherent security system to protect it from malicious attacks and accidental damage from both internal and external sources. The bidder should describe in their responses the security architecture of the solution that will allow this requirement to be fulfilled. Of particular interest is the method of authentication and access control implemented in the solution that will be used to secure the system from “hackers”.

2.3.6 Complete details of infrastructure requirement like space, power, A.C. etc. shall be provided for all the locations as envisaged in the proposed solution.

2.3.7 The bidder shall clearly mention the deliverables from TRAI and service providers, if needed for the proposed solution. The details of all the deliverables by the bidder shall also be given in the format given in section-IV. The bidders should also clearly specify the type of reports and the frequency of the reports that will be submitted to TRAI for real time monitoring.

2.3.8 The captured on-line data is to be displayed on Network Operating centre (NOC) display panels/ wall mounted panels to be set up at the office of TRAI, New Delhi. Complete proposal for installation of servers, processing tools and display panels shall be submitted.

2.3.9 The system to be installed should be able to provide on-line, user configurable GUI based reports of Parameters/KPIs and its graphical display for any service Provider for any LSA vis. a vis. the benchmarks specified by TRAI. Further, it should be possible to generate reports averaged over weekly, monthly and quarterly period from the data so captured. The data captured has to be stored for a period of four months.

2.3.10 The details of servers and data storage requirement shall be worked out so as to preserve the data for a minimum of four months with due redundancies. The details of such calculations and provisioning details shall be submitted. The data (as collected from network elements) shall be stored for a programmable time from the date of collection. The data should be aggregated daily, weekly and monthly, and this aggregated data should be kept for a user-specified time. The bidder should describe the facilities that are available to export data to other applications.

2.3.11 Itemized Bill of Material (BoM) is to be submitted.

2.3.12 Implementation schedule of the project with clear time limits shall be submitted.

2.3.13 The proposed solution shall provide a reporting capability that will enable it to create comprehensive performance reports from a network and a customer service viewpoint. Bidder should describe in their responses the range of reporting types that their solution provides, and the network technologies that it supports.

2.3.14 The proposed solution shall enable performance reports to be created in hard-copy form, or viewed via a web-browser interface. A suitable browser “plug-in” shall be provided to enable browser-based

viewing of performance graphs. It should be possible to define new reports and save the report definitions for other users to access.

2.3.15 The proposed solution shall be designed so as to be highly available exceeding 99.95%, excluding planned maintenance and software and hardware upgrade times. To support the availability target stated above, the solution shall be constructed using redundant components for key elements wherever practical and economically justifiable. The bidder should describe in their responses the design features of their proposed configurations that will support this requirement.

2.3.16 The proposed solution shall be able to carry out self-checks and monitor its inter-connections with all the network elements, and raise an alarm if a connection fails. Such an alarm should be automatically cleared when the failed connection is restored. System shall be able to trigger internal policy recovery mechanism to return to normal operation. The bidder should describe in their responses the facilities available in their solution that will enable this requirement to be met.

2.4 The agency shall undertake Audit and assessment of Quality of Service provided by every Service Provider (licensee) in each of the telecom circles/metro service areas under the respective zone, for Basic, Broadband and Cellular Mobile Services

(a) In respect of Cellular Mobile Telephone Service, all the service areas/circles in each Zone shall be audited in every quarter of the year i.e. a service area will be audited four times in a year.

(b) In respect of Basic Telephone Service (wireline) and Broadband Service, a service area/circle in the contracted Zone shall be audited only once in a year.

2.5 The Audit Agency shall undertake the audit work as follows: -

2.5.1 Preparation of performance Monitoring reports (PMR): The service providers submit to TRAI quarterly Performance Monitoring

Reports (PMRs) and monthly Point of Interconnect (POI) Congestion Reports as part of QoS monitoring reports. It is proposed that the data from server or MSC or NOC of service providers shall be taken directly into the server at TRAI by the agency for processing or the raw PMR data should be collected of each service provider for each circle of its operation on monthly basis and Pushed/Loaded to the central server of TRAI for post processing, before 7th of the following month. The PMR reports as per the present format or as per the format modified by TRAI shall be prepared by the agency after processing of such obtained data/information.

2.5.2 Live measurement for three days: Network performance of service providers is to be assessed for three days in a month in which the audit & assessment is carried out for the QoS parameters as defined in the regulations as mentioned in para 1.1 to 1.4. Live figures from the server/ NMS software are to be recorded for various network related parameters. The live measurement data shall be processed independently of the operators system and uploaded to the central servers.

2.5.3 Data verification for the month in which Audit is to be done: Subsequent to the visits for audit & assessment during the live measurement at various Exchanges/ISP Nodes/Billing centre/Call centre etc., data for all the network and non network related parameters are to be collected from various service providers for the complete month in which the live measurement is carried out. Raw data/records pertaining to these are also verified on sample basis to check the veracity of data provided by the operators. The data should be uploaded to the central server at TRAI immediately for examination.

2.5.4 Drive tests: In the case of Cellular Mobile Service, the audit agency shall also verify the parameters by conducting extensive drive test

in all service areas to assess the network performance. There would be two types of drive tests. One is operator assisted drive test and the other is independent drive tests.

(i) The operator assisted drive test will be done in three cities per circle per month for each operator so that 36 cities/number of drive tests per circle is covered per year for each operator. The drive test shall be conducted covering a minimum distance of 100 kilometers in city area and adjoining areas including important indoor sites for each service provider. The data will be uploaded to the central server for processing and preparing report at the end of the drive test.

(ii) Independent Drive Tests: TRAI has been receiving complaints from subscribers relating to the poor network coverage in certain areas of the cities. Such complaints may need to be checked and verified by way of a drive test to be conducted independently by audit agency with own personnel/equipment or leased or hired from supplier of such equipment /manpower. Thus, the Audit Agency could be asked to do a maximum of 25 drive tests in each Zone every quarter. The location for these drive tests would be selected based on the subscriber complaints being received by TRAI or as advised by TRAI. Independent drive test shall cover a city and adjoining areas covering a minimum distance of 100 kilometers including congested areas and important indoor sites.

2.5.5 Live calling: Live testing is done on a sample basis to check efficiency of the customer care, inter operator call assessment, check back calls for service provisioning and fault repair, metering and billing complaints and Level-1 services.

SECTION-IV

Form-1

PROPOSAL SUBMISSION FORM

(To be submitted on Agency's letter head)

From
(Name and address of the audit agency)

To:
Joint Advisor (QOS)
Telecom Regulatory Authority of India,
Mahanagar Door Sanchar Bhawan
Jawahar Lal Nehru Marg,
New Delhi-110002

Subject: Invitation of EOI bids for random real time monitoring of Quality of Service and audit & assessment of different service providers.

Sir,

We, the undersigned offer to provide our services for the work of random real time monitoring of Quality of Service (QoS), and audit and assessment of QoS provided by various service providers. We are hereby submitting our proposal, in sealed envelope.

Our proposal is binding upon us.

We understand that you are not bound to accept any bid you receive.

Dated, the.....day of2012

Yours faithfully,

Witness:
Signature.....
Address.....

Authorized signatory:
Name and Title of Signatory
Tel. No.
Fax No.
E-mail address

Form-2

**Work of similar nature carried out in the last five years
that best illustrate experience**

Using the format below, provide information on each reference assignment for which your organization was legally contracted. **(Please attach a copy of the documentary evidence supporting the assignment/ experience)**

Assignment	Country
Location within Country	Professional Staff Provided by Your Firm/entity(Profiles):
Name of Client:	
Address:	
Start Date (Month/Year):	Completion Date (Month/Yr.):
Approx. Value of Services contracted Rs.	
Name of Associated Firm, if any	No. of Months of Professional Staff, provided by Associated Firms
Name of Senior Staff (Project Director/Coordinator, Team Leader) involved and functions performed:	
Narrative Description of Project	
Description of Actual Services Provided by Your Staff:	

Authorized signatory:
Name and Title of Signatory

Form-3

Random real time monitoring and Audit & assessment of Quality of Service of various service providers.

Comprehensive technical proposal may be submitted along with the details of items as mentioned below:

1. Complete details of infrastructure requirement like space, power, A.C. etc. at all the locations as envisaged in the proposal.
2. Comprehensive list of deliverables needed from TRAI and Service Providers for implementation of the proposal.
3. The details about the network elements involved and the architecture, interconnectivity details, if any.
4. Complete proposal for installation of display panels.
5. Details of data storage requirement duly worked out and proposal thereof.
6. Itemized Bill of Material (BoM).
7. Detailed and comprehensive list of all the deliverables by the bidder.
8. The report generation capabilities of the system.
9. Implementation schedule of the project with clear time limits.
10. Any other items required for the successful role out of the services.

It should be ensured that all the information as sought in this EOI is submitted. Any other information which shall form part of the proposal may also be submitted with justification.

Authorized signatory:
Name and Title of Signatory