

# NQR

## NETWORK QUALITY REPORTS

A SUBSCRIPTION TO OBJECTIVE  
QUALITY OF SERVICE  
REPORTS

*CALL SUCCESS RATIO*

*UNSUCCESSFUL  
CALL RATIO*

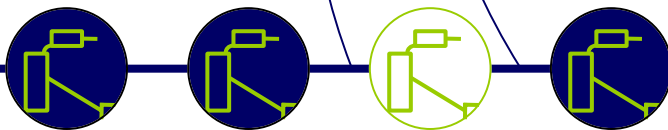
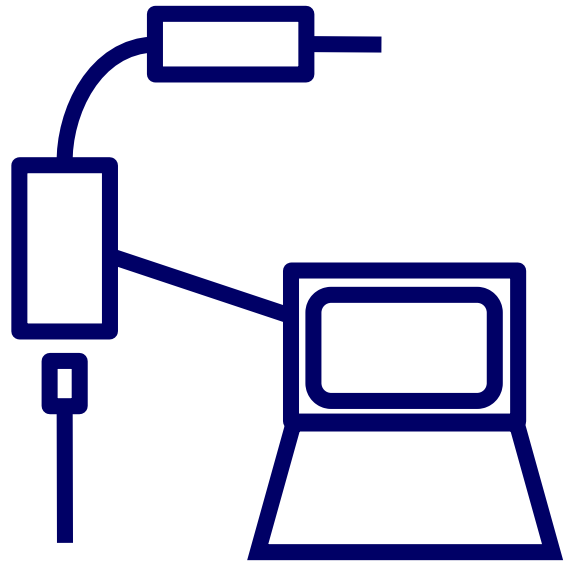
*AVAILABILITY*

*CALL SET-UP  
TIME*

*ACTIVATION  
TIME*

*BER TESTING*

*CAUSE AND  
LOCATION VALUES*



- **Subscription based – no investments required.**
- **Complete QoS documentation in telecom networks.**
- **Basis for network and service improvements.**
- **Verification of SLA's and Authorities requirements (e.g. according to ETSI EG 201 769).**

Utel Systems' Network Quality Reports (NQR) offers a new, cost-effective and convenient way of monitoring and documenting your Quality of Service (QoS). We offer subscription to Network Quality Reports generated by our nationwide testing network. By means of this quality-testing network we simulate subscriber behaviour from several geographical locations and do according to a carefully planned schedule generate thousands of calls in the network. All details of these calls are logged and processed into QoS reports including identification of location and cause for all types of abnormal call behaviour. NQR is designed to serve network operators, service providers and major users of telecom services.



**Your customers will notice**



**THE IMPORTANCE OF QoS**

Today's fierce competition in the deregulated market has revealed QoS as an increasingly more important differentiator. The increase in network usage and customer's dependability upon network services asks for quality-focused networks. Further the increased complexity and dynamics set by the great number of operators and providers along with different network technologies, vendors and solutions on the technical side, emphasise this. Competing on this arena requires first hand knowledge of user perceived quality.

The same trend is also showing from the other side; Customers and Authorities are more quality concerned and require network quality and performance documentation.

**PRODUCT DESCRIPTION**

Network Quality Reports is a risk free subscription to objective network and service quality reports. The performance parameters are derived from our nation wide quality-measuring network, bringing the geographical dimension into the testing. We own, operate and maintain this network. NQR represents a very convenient way to receive information derived from the end-to-end quality testing across point of interconnects using the national prefix codes. Depending on your needs and requirements three versions of the standard product is available along with extensive options.

**Bronze**

- Monthly, quarterly and yearly reports
- Up to 5400 test calls per month
- 450 test calls monthly during busy hour

**Silver**

- Weekly, monthly, quarterly and yearly reports provided
- Up to 5040 test calls per week (385 calls per traffic route)
- 420 test calls weekly during busy hour

**Gold**

- Daily, weekly, monthly, quarterly and yearly reports provided
- Up to 2880 test calls per day (221 calls per traffic route)
- 240 test calls daily during busy hour

The above figures are based on an initial system configuration and are subject to changes.

**Options**

- Customer specific reports - tailored to satisfy the customer's specific requirements
- Expert analysis and comments to single reports
- Special testing e.g. in connection with particular problems, network changes, introduction of new services, etc.
- ISP testing - test of modem pools
- Error tracking - includes interactive call simulation, full protocol decoding and use of expert know-how
- Test of IN service and functionality
- Billing verification
- Integration of quality information in customer's support and management systems
- Additional Remote Units deployed in customer's proprietary networks and public fixed network
- Consultancy services

All weekly, monthly, quarterly and yearly reports contain history and trend analysis. The number of test calls is not absolute and can be extended further if required. All reports follows guidelines given by international standards, the most important being ETSI ETR138.

**TYPES OF REPORTS**

The different functions and departments within the customer's organisation will typically have different requirements with respect to the detailing and frequency of the Network Quality Reports. In addition there is a need to monitor and report QoS both in the short and long term. As a result several different types of reports have been defined as specified below:

- Daily reports
- Weekly reports
- Monthly reports
- Quarterly reports
- Yearly reports

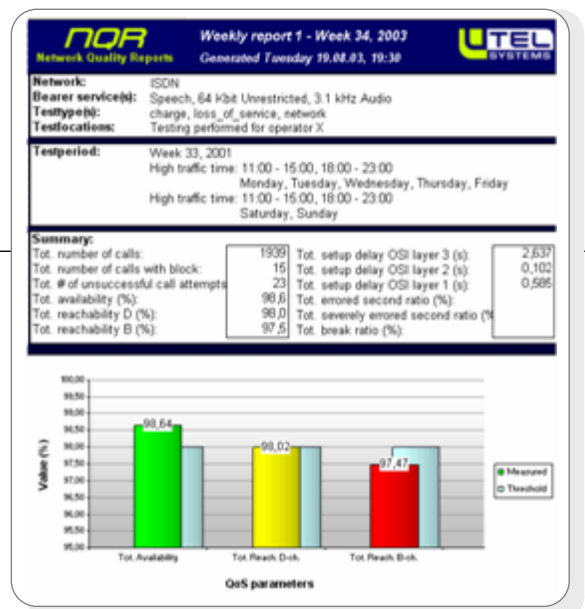
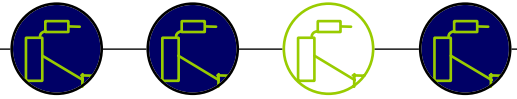


Figure 1: The report summary to the right shows (from the top) what kind of network and services tested, the test period, a summary of all tests and a graphical presentation of the key figures.



Message	0	5	10	15	20	25	30	35	40	45	50
Number of calls	0	0	0	0	0	0	0	0	0	0	0
Number of calls with blocks	0	0	0	0	0	0	0	0	0	0	0
# of unsuccessful call attempts	0	0	0	0	0	0	0	0	0	0	0
Availability (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Reliability (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Setup delay (ms) Layer 3 (s)	1.388	1.221	0.895	1.147	1.524	1.364	1.287	0.888	1.181	1.136	1.136
Setup delay (ms) Layer 2 (s)	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.290
General account calls (%)											
Temporarily suspended account calls (%)											
Block ratio (%)											

Figure 2: The “Detailed Report” in NQR shows traffic route details. Values close to a threshold is marked in yellow and values exceeding the threshold are displayed in red.

Following the summary are the traffic route details. By double-clicking on a value in this view, one will get access to details of individual calls. A typical scenario would be to click on the highlighted red numbers to find out where the irregularities in the network are found and what caused each error. This is done by utilising ITU-T Q.850’s definition of call location and call cause.

All reports show graphically and with key figures the results from the period’s testing along with information about each single traffic route. It is even possible to look at details of the individual test calls to identify location and cause of abnormal call behaviour. The following lists specifies the report contents:

- Summary with key figures and graphics
- Traffic route information
- Details of single test calls
- Distribution of each key parameter
- Variations within the period
- Trend analysis
- Definitions

All reports are presented in MS Excel format and can easily be edited (e.g. to XML or HTML format) or included in other applications.

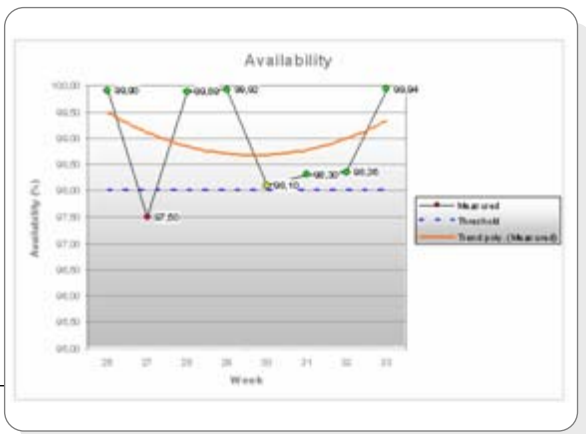


Figure 3: NQR is presenting different QoS parameters graphically such as “Availability”.

**SYSTEM DESCRIPTION**

Network Quality Reports is generated by a continuously running quality and performance-monitoring network owned and operated by Utel Systems.

A number of Remote Units (RU's) are deployed in the fixed public network to cover the national carriers points of interconnect. These units are programmed to simulate the end-user behaviour with respect to network and service activation. All RU's are controlled from the NQR Operating Centre and performs carefully chosen quality tests according to a pre-programmed schedule. A central computer then performs analysis and generates the subscribed reports showing the quality and performance of networks and services. An effective algorithm controls the calling sequence and ensures the defined numbers of calls are handled optimally.

The system utilises operator prefix in order to choose which operator to test. This opens for testing across operators - inter-operator testing

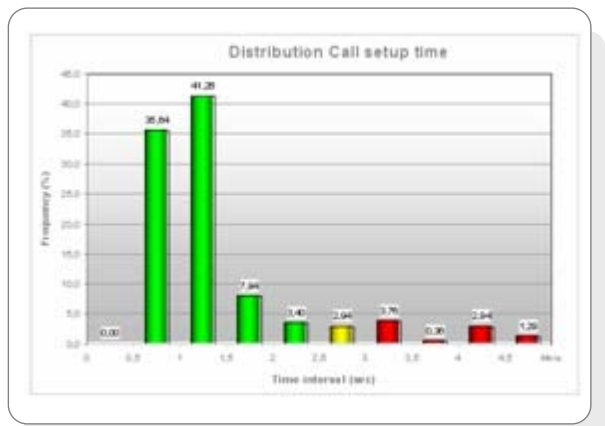


Figure 4: The graph presents the distribution of Call Setup time over a week.

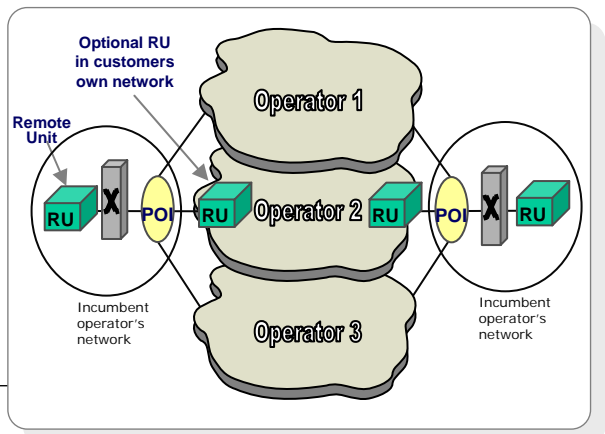


Figure 5: A system sketch showing where in the network test units (Remote Units – RU's) are located in order to generate traffic for the Network Quality Reports.



## FEATURES AND BENEFITS

Feature	Customer benefit
Statistical reporting on network congestion and increased revenues	<ul style="list-style-type: none"> <li>- Improved planning leading to reduced and service quality</li> <li>- Early detection of performance degradation implies reduced number of customer complaints and increased customer loyalty</li> <li>- Cost efficiency through optimisation of element, network, service and application resource utilisation</li> <li>- Objective reporting fulfilling requirements of regulatory authorities</li> <li>- Objective reporting against elements of service level agreements (SLA)</li> <li>- Objective QoS figures for product marketing</li> </ul>
Subscription to reports	<ul style="list-style-type: none"> <li>- Reduced cost - no system investment required, no operation and maintenance cost</li> <li>- Reduced risk - no system installation risk</li> <li>- Reduced personnel cost - no system operation required, no training required</li> </ul>
Nationwide testing network	<ul style="list-style-type: none"> <li>- QoS reports based on test calls generated from several geographical locations</li> </ul>
Inter-operator testing	<ul style="list-style-type: none"> <li>- Detection of billing errors from incumbent operator</li> <li>- Detection of insufficient capacity from incumbent operator</li> </ul>
Expert comments to reports	<ul style="list-style-type: none"> <li>- Increased value - maximum benefit from the Network Quality Reports</li> </ul>
ISP testing	<ul style="list-style-type: none"> <li>- Detection of insufficient modem pool capacity</li> </ul>
Verification of billing records	<ul style="list-style-type: none"> <li>- Increase revenues by early detection of missing billing records</li> <li>- Documentation of statistical accuracy of billing system</li> </ul>
Dynamic calling matrix	<ul style="list-style-type: none"> <li>- The number of calls can be set up to fit each individual customers requirements</li> </ul>
Alarms on congestion and low availability	<ul style="list-style-type: none"> <li>- Early and efficient warning of critical service affecting conditions</li> </ul>
Availability and confidence	<ul style="list-style-type: none"> <li>- The complete system generating the reports are developed and operated by Utel Systems to secure maximum performance and availability</li> </ul>
Open information model	<ul style="list-style-type: none"> <li>- The Network Quality Reports are provided in MS Excel format for easy integration in other applications and systems</li> </ul>

## TECHNICAL SPECIFICATIONS

### Protocols supported

- DSS1 Layer 1, INFO 0 to 4.
- DSS1 Layer 2 (Q.921/I.441).
- Euro-ISDN Layer 2, LAPD, LAPDE, LAPB, LAPBE.
- DSS1 Layer 3 (Q.931/I.451).
- Euro-ISDN Layer 3.
- X.25 (B- and D-channel, Layer 3).
- Layer 6 and 7, ASN-1 (Supplementary Services).

### Standards supported

- ETSI ETR 138
- ITU-T E.800
- ITU-T Q.850

### Parameters

- Unsuccessful call ratio
- Availability
- Call success ratio
- Call setup time
- Wait for dial tone
- Activation time
- Call cause value
- Location value
- Type of exchange

Note! Any protocol derived parameter can be reported.

### The ETSI guide

The document ETSI EG 201 769 defines objective and comparable measures of QoS delivered to users/ customers. The QoS parameters are:

ETSI EG 201 769 QoS Parameters	NQR
5.1 Supply time for initial connection	Option
5.2 Faults rate	Option
5.3 Faults repair time	Option
5.4 Unsuccessful call ratio	Yes
5.5 Call set-up time	Yes
5.6 Response times for operator services	Option
5.7 Response time for directory enquiry srv.	Option
5.8 Public pay-phones in working order	Option
5.9 Billing correctness complaints	Option

Note! NQR can be used as a common reporting tool if data from administrative systems are used as input.

### Manufacturer

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Please contact us for information about your local distributor.



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