

DirectQuality R7 - Service Level Test Automation

Multi-User, Server-Based Management



Proactive Service Level Test Management for Voice, VoIP, Fax, Video and Internet over IP, TDM, PacketCable, Cellular & WiMAX.

Tektronix' DirectQuality® system allows you to test and monitor the quality of your current and upcoming services as perceived by your end-users:

- | | | |
|-------------------------|-----------------|------------------|
| ► VoIP | ► Long distance | ► IP Centrex |
| ► IP video | ► Calling card | ► PC-to-phone |
| ► Carrier pre-selection | ► Conferencing | ► IP call center |
| ► Video conferencing | ► VoIP peering | ► Fax/modem |
| ► Peer-to-peer gaming | ► Internet | ► Pre-paid |
| ► International transit | ► ISDN | ► Toll-free |

DirectQuality R7:

- Web-Based
- Easy to Use
- Fully Automated
- Business-Driven

DirectQuality R7 simplifies business-level decisions by providing complete service level test automation from test call generation to IP QoS troubleshooting. The web-based OSS features color-coded service level thresholds for reporting, alarming and analysis.

Guarantee service levels of any trunk, route, VoIP peering partner, access link or carrier by monitoring their QoS status through testing, fault management and advanced drill-through reporting. Assure the quality of TDM, IP, cable, xDSL and wireless networks and your triple-play offerings with a single, integrated solution.

Tektronix®
Enabling Innovation

Enabling Next-Generation Network Innovation

Manage & Automate

Web-Based OSS

- No client software to install, easy to use and easy to maintain. Access DirectQuality from any web browser to manage test plans, view & analyze results.
- Substantially reduce equipment, deployment and maintenance costs.

Multi-User

- Multi-profile users from various locations can generate test plans, view results and share test probes.

PTI Test Destination Database

- Test using Tektronix' directory of over 230,000 public number test destinations in more than 230 countries worldwide.
- Users can add trunks, cities, breakouts and test numbers for unlimited worldwide Telephony, Video and IP test coverage.

Detect & Interpret

Decision Support System

- The DirectQuality DSS presents results in a meaningful and simple Web report format.
- Eliminate finger-pointing and accelerate troubleshooting by drilling-down from QoS indexes to the technical problem cause.

QoS Analyzer & Service Level Classes

- The DirectQuality R7 server objectively analyzes thousands of test calls in seconds. Provision new services faster and reduce customer churn by proactively detecting and troubleshooting problems.

Integrated E-Model Application

- Tektronix' award-winning E-Model (G.107) implementation combines analog & IP measurements to calculate MOS & R-factor.

Audio/PRI Call Progress Analysis

- Complete call progress is analyzed for each test call using an exclusive enhanced E.180 implementation to easily detect billing discrepancies.

Web-based Trending, Service Level Reporting and Alarming

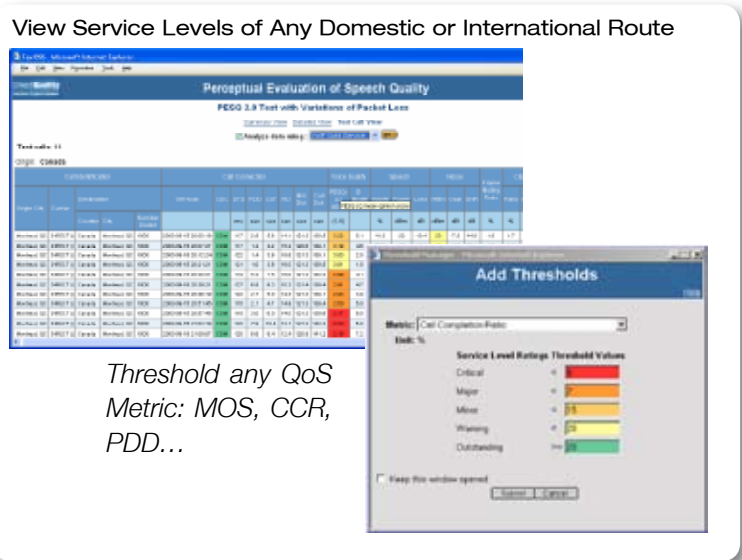
Generate high-level and detailed performance reports that provide comprehensive QoS metrics such as MOS scores, Call Completion Ratios (CCR) and Post Dial Delay (PDD) from the aggregated results of multiple test plans and live monitoring measurements.

Using color-coded web-based reports, you can quickly see service faults and SLA violations by country, city, carrier and trunk.

Color-coded Service Levels

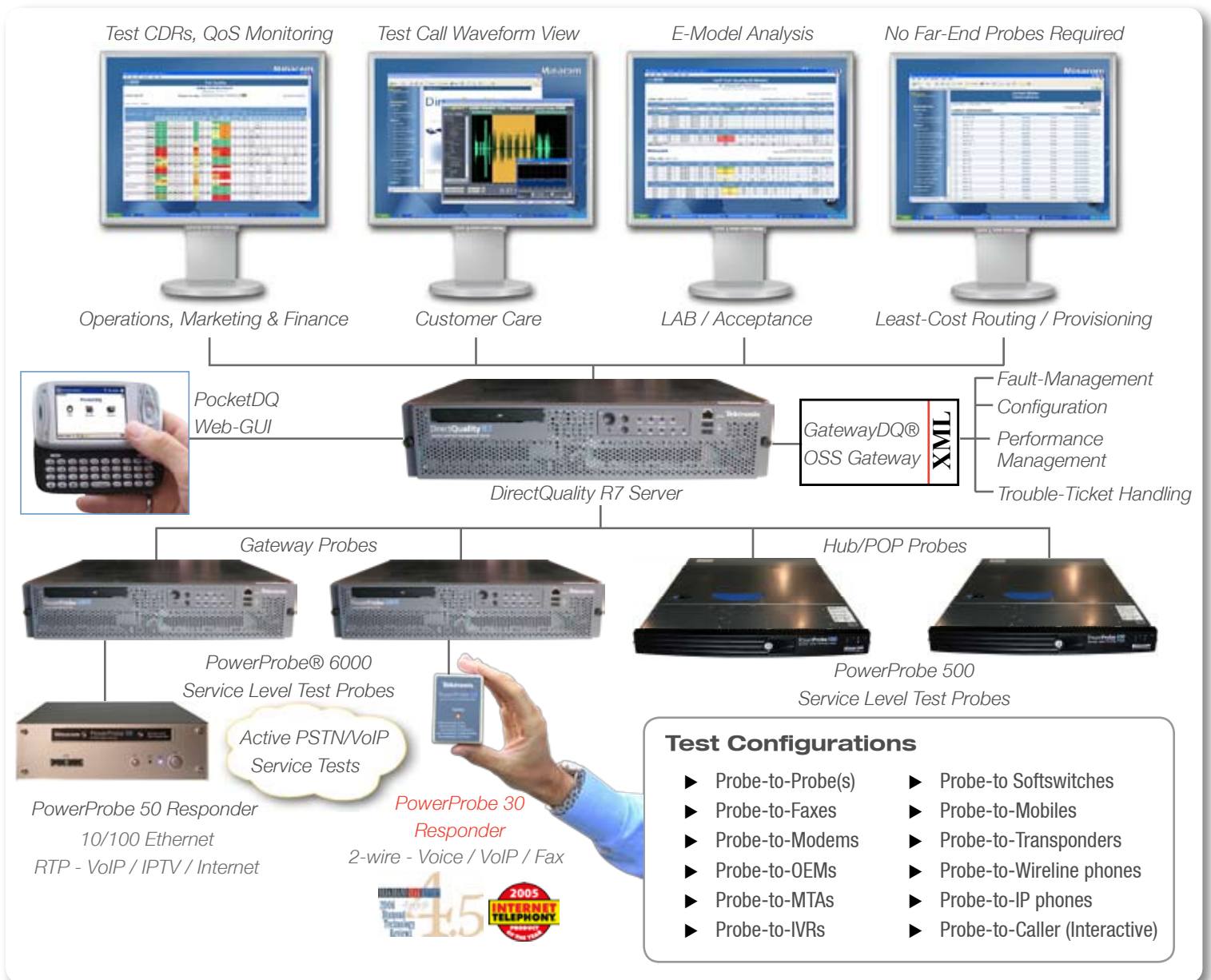
DirectQuality simplifies monitoring, SLA validation and fault management by allowing you to independently threshold over 340 service quality metrics - up to five color-coded service level classes / severity levels can be defined to reflect your operational objectives.

View Service Levels of Any Domestic or International Route



The screenshot displays a web-based report titled "Perceptual Evaluation of Speech Quality" for a "PESQ 3.9 Test with Variations of Packet Loss". It features a data table with columns for "Metric", "Value", "Status", and "Color". The table lists various metrics such as MOS, CCR, and PDD for different test plans and routes. A "Add Thresholds" dialog box is overlaid on the bottom right, showing a dropdown menu for "Metric" set to "Call Completion Ratio" and a "Threshold" field. Below this, a "Service Level Ratings Threshold Values" section shows five color-coded levels: Critical (red), Major (orange), Minor (yellow), Warning (light green), and Outstanding (dark green). The dialog also includes a "Keep this window opened" checkbox and "Cancel" and "Apply" buttons.

Threshold any QoS Metric: MOS, CCR, PDD...



Test Applications

- ▶ VoIP / IPTV monitoring & provisioning
- ▶ Speech quality (echo, noise, clipping)
- ▶ Call quality / SLA monitoring
- ▶ Trunk testing 100, 102, 105, 108
- ▶ Connectivity performance
- ▶ LCR test automation
- ▶ Carrier benchmarking
- ▶ Fax and modem connectivity
- ▶ Fax troubleshooting
- ▶ Billing verification QoS user-satisfaction surveys
- ▶ Customer LAN VoIP readiness
- ▶ Voice codecs and VADs
- ▶ Video connection
- ▶ Service / network reliability
- ▶ Media gateway / softswitch acceptance
- ▶ RTP performance (packet loss, jitter delay)
- ▶ IP QoS Troubleshooting (ping, traceroute, DNS)
- ▶ DTMF Transparency, Caller ID Issues
- ▶ Polyphonic audio quality
- ▶ WiMAX / WiFi network deployment

Enabling Next-Generation Network Innovation

Resolve Problems Quickly

① Generate Test Plan

② View Results

Analog, T1/E1, Wireless, IP/ Ethernet: All interface types are integrated in same easy-to-use Web GUI

Advanced Testing Automation

DirectQuality anticipates measurement requirements, then generates and executes complete test plans based on your quality-of-service objectives. Simply select the service to test, the test destinations (other probes, public numbers, responders, network elements xDSL/Cable Modems, or MTAs), the carrier, trunk or network to test, and the frequency of execution using the point-and-click, all-web GUI.

► Pre-Defined Testing Objectives

DirectQuality generates test plans based on your selected test objectives, determining the set of measurements to perform from the valid terminations available.

► Test Call Generation Automation

DirectQuality generates test numbers, and associates available testing resources to each test call based on the number of test calls you want to generate and the destinations / breakouts or trunk groups you want to test.

► Pre-defined and Customized Execution Schedules

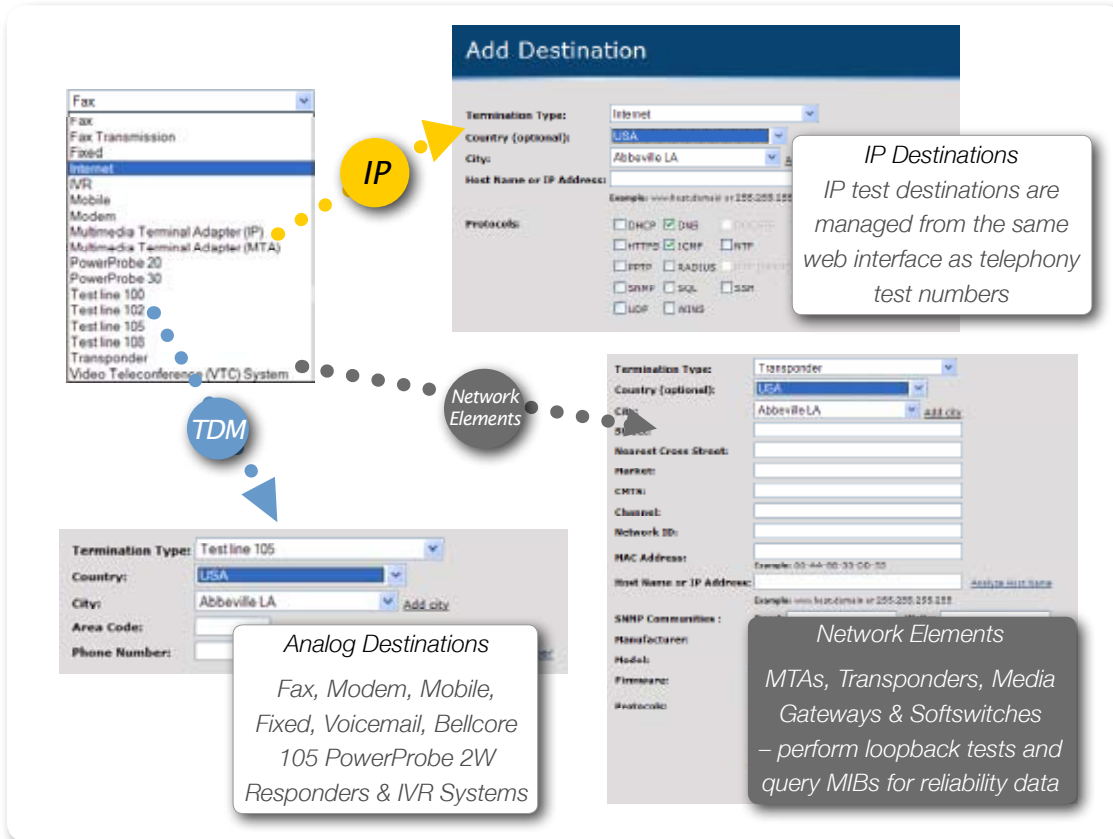
DirectQuality makes it easy to schedule test plan executions. Test plans can be performed on a scheduled or ad-hoc basis. Pre-defined execution schedules include:

- Immediate execution
- Periodic executions: hourly, daily, weekly, or monthly
- Ad hoc executions, on specific dates and times

DirectQuality also provides multi-user, multi-probe and multi-port conflict management, as well as full control over recurrence patterns.

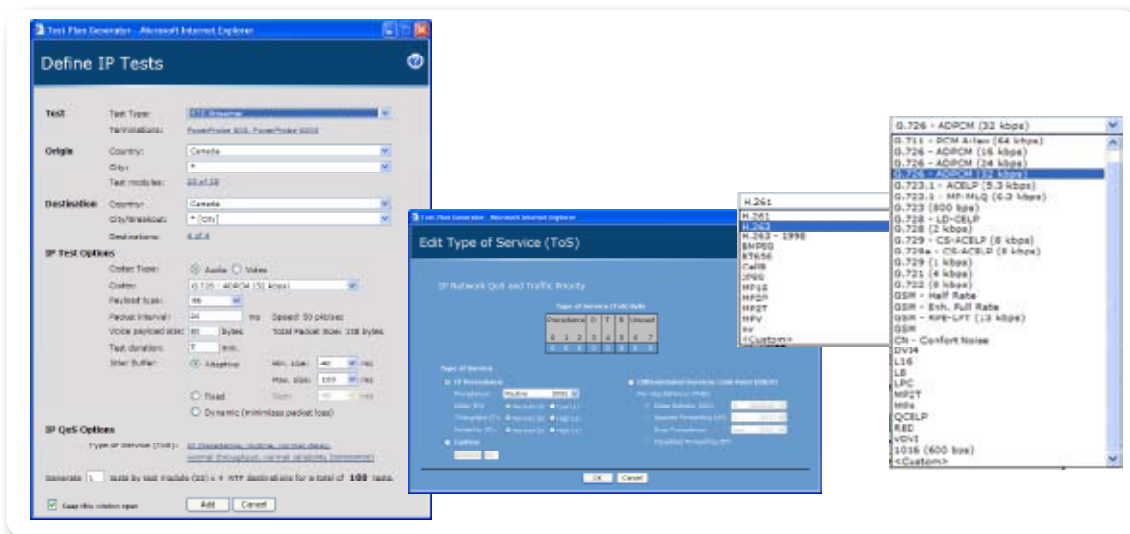
Far-End Analog / IP Test Number Management

DirectQuality lets you add and manage your own library of test destinations that can include analog and mobile phones, fax machines, modems, voicemail and IVR systems, network elements, subscriber-based MTAs, transponders, OEM trunk-test responders, IP servers and Tektronix' exclusive VoIP / IP PowerProbe responders.



IP QoS Troubleshooting

Using DirectQuality you can test, benchmark and troubleshoot your legacy and next-gen IP-based audio/video/Internet/fax and data services over analog, T1/E1, and IP interfaces from a single web-based OSS.



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Call Connectivity / Speech / Fax Quality Reports

Extensive Configuration Options

DirectQuality R7 allows you to carefully replicate your particular traffic and network conditions with a wide variety of settings. You can also tailor report formats, alarm notifications, data exchange settings and testing defaults to streamline your workflow.

Live Monitoring and Service Alarms

The screenshot displays the 'Alarm Gateway Subscribers' interface. At the top, there are buttons for 'Delete', 'Disable', 'Enable', and 'Add'. Below this is a table with columns: 'Subscriber', 'Adapter', 'Alarm Severity', and 'Send Alarms'. The table contains two entries:

Subscriber	Adapter	Alarm Severity	Send Alarms
CT Fault Management HPOV	SNMP	Critical	Highest severity
Netcool	SNMP	Warning	Warning and higher

Below the table, there are several panels:

- Schedule Test:** Shows 'Test Plan: BELGIUM' and 'Server Time: 04:04:2006, 1...'. It includes sections for 'Time Period', 'Options', 'Service Level Class Analysis' (with 'Evaluate test calls using' set to 'Best Practice' and an 'Automate Analysis' button), 'Alarm Generation' (with 'Send alarms to subscriber' set to 'Netcool'), and 'Test Plan Completion' (with checkboxes for 'Notify by email and send reports as links' and 'Export raw data results in a CSV file').
- Edit Alarm Subscriber:** Shows fields for 'Subscriber name' (Netcool), 'Alarm severity' (Warning or higher), 'Note', 'Adapter' (Type: SNMP, Manager address: 192.168.1.187, Port: 162, Community: Public, Enterprise(OID): 1.3.6.1.4.1.8315.1.1), and buttons for 'Generate Alarms' and 'Export Results'.

Yellow callout boxes highlight 'Up to 5 Alarm Severity Levels', 'SNMP and XML Adapters', 'eMail Reports', and 'Export Results'.

By monitoring the severity of service level alarm events, carriers and service providers can proactively manage their service delivery. DirectQuality's QoS Gateway keeps service managers informed through SNMP and XML alarms that can be sent to network monitoring systems such as HP OpenView and Micromuse Netcool, or to any target directory.

QoS alarms originate from the QoS Analyzer which monitors measurement values collected from the network against user-definable Service Level Classes. If a value falls within a threshold range of a Service Level Class, the QoS Analyzer generates an alarm and sends it to Gateway Subscribers for immediate alarm notification.

Integrate & Maintain

Remote Probe Management

- ▶ DirectQuality intelligently manages the PowerProbe® service level test probes that conduct tests using Tektronix software agents.
- ▶ Use a web browser to configure and manage your testing resources; no technician dispatch required.

Manage Quality & Reliability

- ▶ Tektronix DirectReach® network test agents query network elements to let you monitor service quality and reliability from a single platform.

OSS Integration

- ▶ Tektronix' GatewayDQ® seamlessly integrates DirectQuality's service quality visibility into your existing OSS and fault-management systems.
- ▶ Easily integrate existing operational procedures, databases and systems with service deployment, SLA verification and monitoring strategies. Automate partner-carrier selection and validation.

Tektronix' Communications Business Division –

Enabling Next-Generation Network Innovation

Tektronix' Communications Business enables the world's largest network operators and equipment manufacturers to design, build, test, deploy and manage current and advanced communication networks.

With the convergence of voice, data and video into the latest generation IP multiservice mobile and fixed networks, the requirements for monitoring and testing networks and their elements are becoming more complex every day. Leveraging a 60- year heritage of enabling innovation, Tektronix empowers network operators and equipment manufacturers to lead the way toward fixed mobile convergence, broadband wireless access and triple play services by supporting current and advanced protocols, applications and architectures, such as IP multimedia subsystems (IMS), 3G wireless, WiMAX and IPTV.

As a result of our dedication to innovation, as well as our customers, Tektronix' systems manage more than 30 percent of the world's calls, and our network diagnostic and performance monitoring solutions are installed in 110 carrier networks in 43 countries.

For Further Information

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology.

Please visit www.tektronix.com

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