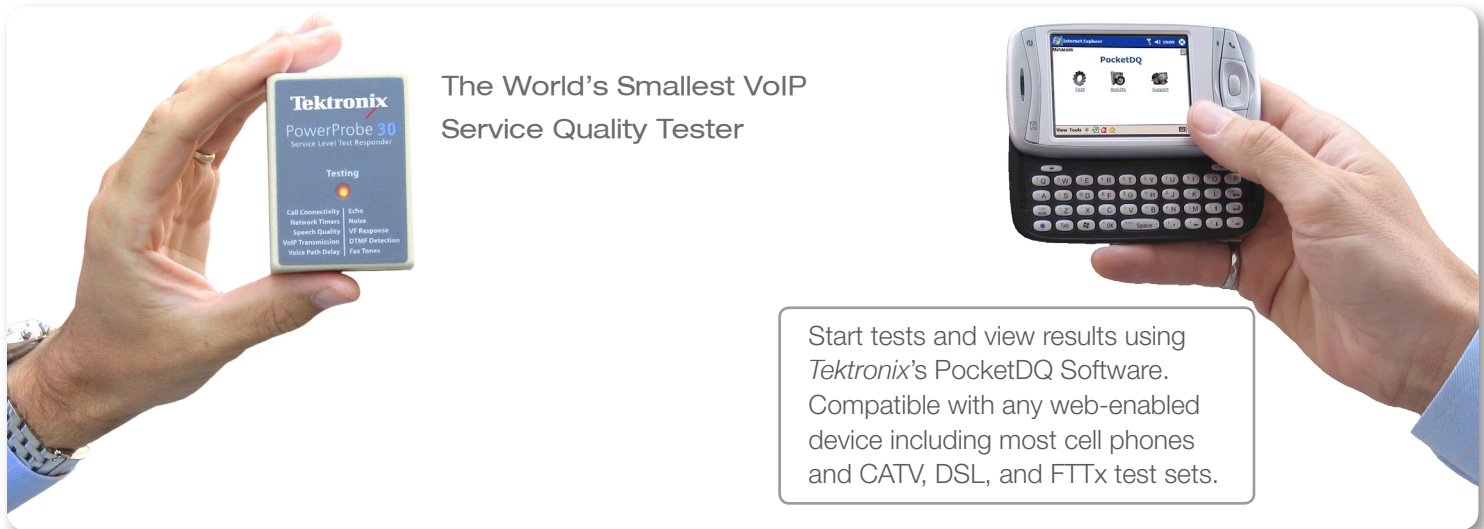


VoIP Provisioning Test Solutions

Active Service Assurance



The World's Smallest VoIP Service Quality Tester

Start tests and view results using Tektronix's PocketDQ Software. Compatible with any web-enabled device including most cell phones and CATV, DSL, and FTTx test sets.

Connect the PowerProbe 30 to any 2-wire phone jack and conduct more than 60 service level measurements in less than a minute.

Integration with the DirectQuality R7 Service Level Assurance platform provides standards-based testing, centralized data logging and reporting, third-party OSS integration, and service Level classification.

Key Features and Benefits

Simple & Cost Effective

The PowerProbe 30 is line powered – simply connect to any phone jack and start the test using the PocketDQ interface from your existing testset or web-enabled cell phone.

You won't have to replace your existing testsets to provision VoIP. PocketDQ is already integrated into most popular testsets used by xDSL, cable, and FTTx field technicians.

Clear Results

Tektronix DirectQuality server-based test system means consistent test results analysis using centrally stored test plan Pass/Fail criteria.

Test results are displayed on the screen of your testset or cell phone. Drill-through capabilities let technicians perform in-depth troubleshooting.

Fast

Exclusive Single Call – Multi-Test technology speeds up and simplifies VoIP installation and troubleshooting.

The PowerProbe 30 can conduct 60 measurements in less than a minute. With such quick testing, you can easily validate every new VoIP installation before leaving a customer's home.

Measure a Full Array of Phone Service Metrics & Impairments:

- CODEC Performance
- Frequency Response
- DTMF Detection
- Fax Tones
- Packet Loss
- Call Volume
- Speech Quality (MOS)
- Call Connectivity
- Network Response
- Voice Path Delay
- Echo
- Noise

No Day-End Downloads

Technicians won't need to download test results each day. Tektronix DirectQuality server based test system logs test results as they happen.

Every test call's voice or fax recording is immediately available from any web browser, test set or cell-phone.

Technicians and NOC personnel can troubleshoot together with shared test results. Resolve problems fast.

Test Plan Automation

MSOs can customize the tests performed by the PowerProbe 30, automating their existing test plans for consistent execution.

With centralized pass/fail thresholds, technicians require minimal training.

Tektronix®
Enabling Innovation

Testing with the PowerProbe 30

Simple, comprehensive testing verifies digital phone service quality and related services.



Minacom
PocketDQ

User Name:
 Password:
☐ Change password

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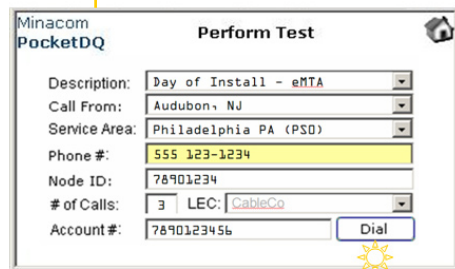
Secure login to the centralized DirectQuality test automation server



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PocketDQ

[Test](#) [Results](#) [Support](#)

Direct contact with Tektronix or your operations group for immediate support



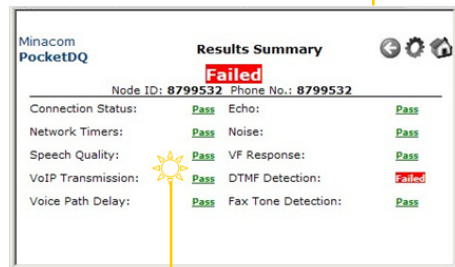
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PocketDQ

Perform Test

Description:
 Call From:
 Service Area:
 Phone #:
 Node ID:
 # of Calls: LEC:
 Account #:

Define test number and start the call

Test calls last less than a minute



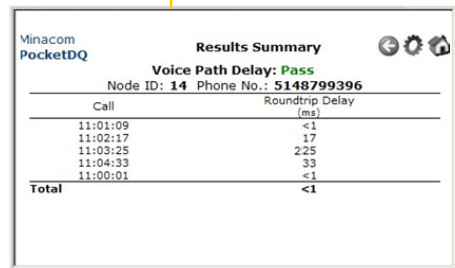
Minacom
PocketDQ

Results Summary

Node ID: **8799532** Phone No.: **8799532**

Connection Status: **Failed** Echo: **Pass**
 Network Timers: **Pass** Noise: **Pass**
 Speech Quality: **Pass** VF Response: **Pass**
 VoIP Transmission: **Pass** DTMF Detection: **Failed**
 Voice Path Delay: **Pass** Fax Tone Detection: **Pass**

Pass/Fail thresholds are provider-defined, by standard test plans

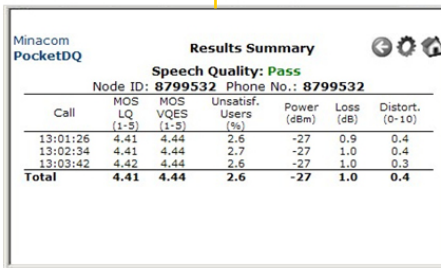


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Results Summary

Voice Path Delay: **Pass**
 Node ID: **14** Phone No.: **5148799396**

Call	Roundtrip Delay (ms)
11:01:09	<1
11:02:17	17
11:03:25	225
11:04:33	33
11:05:01	<1
Total	<1



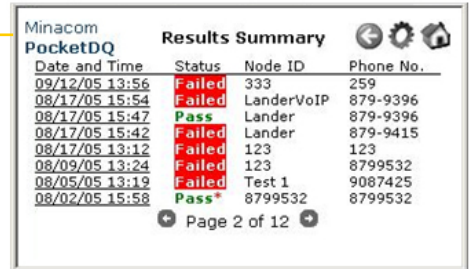
Minacom
PocketDQ

Results Summary

Speech Quality: **Pass**
 Node ID: **8799532** Phone No.: **8799532**

Call	MOS LQ (1-5)	MOS VQES (1-5)	Unsatisf. Users (%)	Power (dBm)	Loss (dB)	Distort. (0-10)
13:01:26	4.41	4.44	2.6	-27	0.9	0.4
13:02:34	4.41	4.44	2.7	-27	1.0	0.4
13:03:42	4.42	4.44	2.6	-27	1.0	0.3
Total	4.41	4.44	2.6	-27	1.0	0.4

Drill-through functionality gives detailed info for troubleshooting

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PocketDQ

Results Summary

Date and Time	Status	Node ID	Phone No.
09/12/05 13:56	Failed	333	259
08/17/05 15:54	Failed	LanderVoIP	879-9396
08/17/05 15:47	Pass	Lander	879-9396
08/17/05 15:42	Failed	Lander	879-9415
08/17/05 13:12	Failed	123	123
08/09/05 13:24	Failed	123	8799532
08/05/05 13:19	Failed	Test 1	9087425
08/02/05 15:58	Pass*	8799532	8799532

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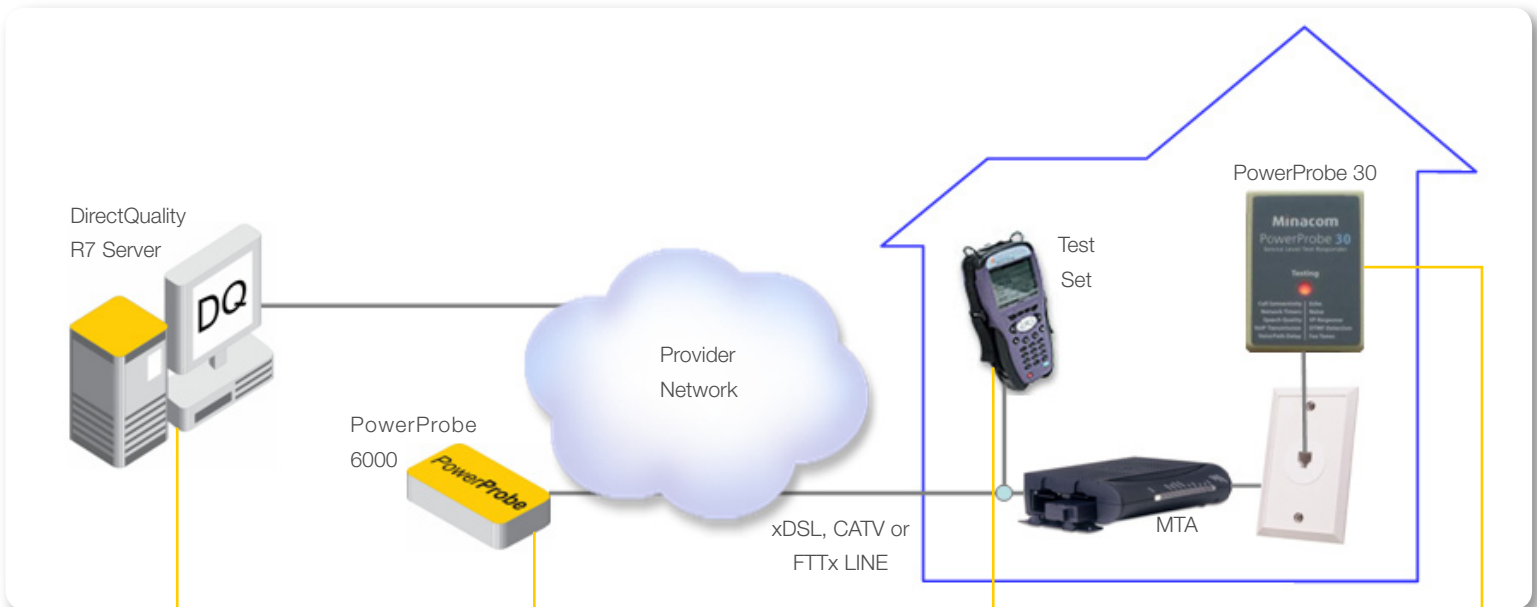
View results stored on the server

Technicians can view previous results for the same home.

Results are shared with other technicians and operations support engineers when required – helping to resolve problems faster.

PowerProbe 30 & DirectQuality R7

Service Level Test Automation for Day-of-Install Testing



The DirectQuality R7 Server receives test requests from the technician's testset in the field, then immediately informs the PowerProbe 6000 to start the test.

When tests are completed, the DirectQuality server downloads the test results from the PowerProbe 6000.

With centralized test data, NOC personnel can perform detailed troubleshooting, trending, report generation and data analysis.

The DirectQuality Server's web-based OSS interface can be accessed by any computer connected to the internet.

Using GatewayDQ, DirectQuality is easily integrated into existing OSS and fault-management systems.

The PowerProbe 6000 executes tests by placing test calls to technicians' PowerProbe 30 units in the field.

A single PowerProbe 6000 can support hundreds of technicians and their responders.

Did You Know?

Tektronix' DirectQuality platform is currently used by more than 60 service providers globally.

Technicians request a test using your existing xDSL, CATV, or FTTx test sets or a web-enabled cell phone running *Tektronix' PocketDQ* software.

When the test is complete, full results immediately appear on the screen.

For each Test Call, 60 service level measurements are collected by the PowerProbe 30 covering:

- ▶ Call Connectivity
- ▶ Network Responsiveness
- ▶ Speech Quality (MOS)
- ▶ CODEC Issues (VAD, Packet Loss)
- ▶ Echo
- ▶ Noise
- ▶ Voice Path Delay
- ▶ Frequency Response
- ▶ DTMF Detection
- ▶ Fax service quality

PowerProbe 30 QoS Measurements



Connection Status

- Call Disposition Code
- PRI Cause Value
- PRI Cause Location

Network Timers

- Dial Tone Delay
- Post Dial Delay
- Billing Duration
- Call Duration

Speech Quality

- PESQ LQ MOS
- VQES MOS
- Unsatisfied Users Ratio
- Speech Power
- Speech Loss
- Speech Distortion

Fax Tone Detection

- CNG Tone Detection
- CNG Tone Duration
- CED Tone Detection
- CED Tone Duration

VoIP Transmission

- Frame Muting Ratio
- Comfort Noise
- Clipping Events
- Total Clipping Duration
- Average Clipping Duration
- Maximum Clipping Duration
- Proportion of Front-End Clipping
- Front-End Clipping Events
- Average Front-End Clipping Duration
- Proportion of In-Between clipping
- In-Between Clipping Events
- Average In-Between Clipping Duration
- Proportion of Back-End clipping
- Back-End Clipping Events
- Average Back-End Clipping Duration
- Hang-Over Events
- Average Hang-Over Time

Noise

- C-Message Noise
- Wideband Noise
- C-Notch Noise
- Gain
- SNR

Echo

- Echo Path Loss
- Echo Path Delay

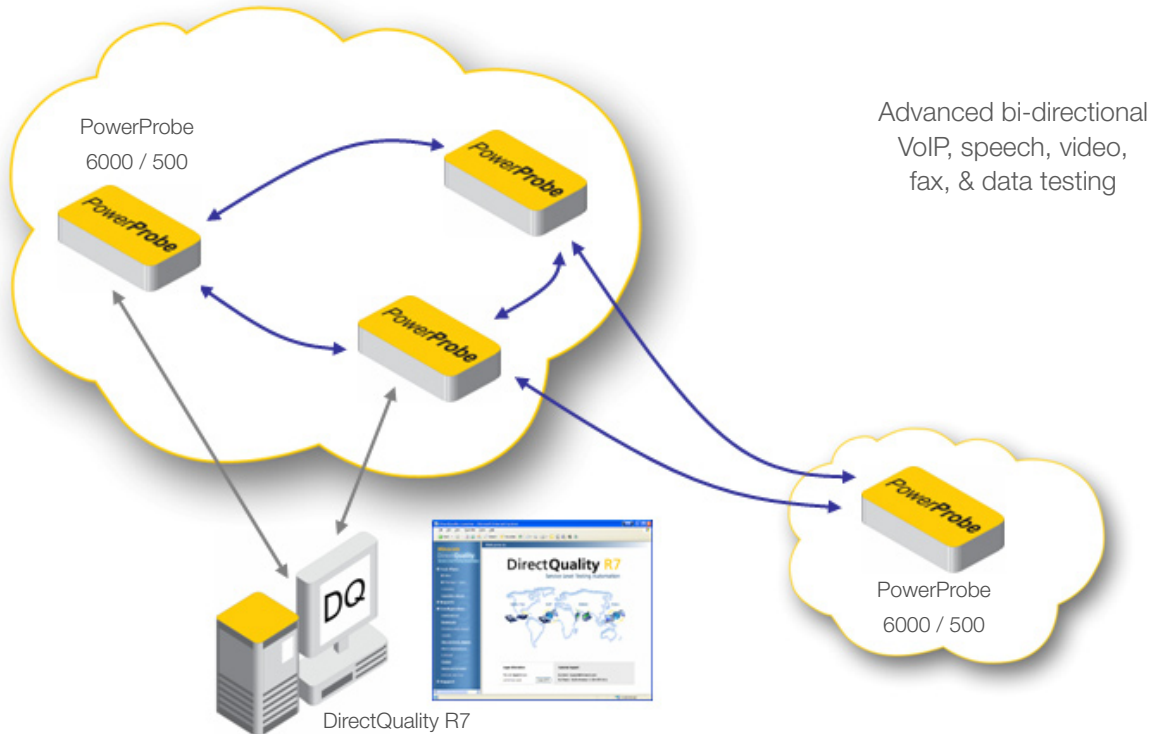
DTMF Detection & Validation

- 0 to 9, *, #

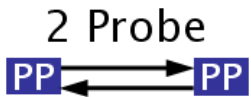
Frequency Response

- Loss (1100Hz, 2100Hz)
- RSL (1100Hz, 2100Hz)

Voice Path Delay



Advanced On-Net QoS Testing



Perform uni-directional and bi-directional, end-to-end testing between any two PowerProbe 6000 / 500 service level test probes. 2 Probe test agents record call progress as well as the actual voice/data traffic for playback and signal analysis.

Innovative Test Layouts

For Provisioning, Troubleshooting & Monitoring

DirectQuality R7 provides a variety of ways to conduct QoS testing, each has advantages for particular applications. Service providers deploying VoIP can take advantage of more than one test layout style for increased test coverage and flexibility.

Monitor

Once VoIP is deployed, DirectQuality R7 naturally extends to network-wide QoS monitoring using the same PowerProbe 6000/500s used for day-of-install testing.

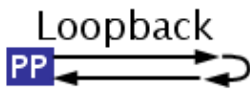
Troubleshoot

DirectQuality R7 is integrated with most softswitches, permitting loop-back testing to subscribers' MTAs and transponders in your network.

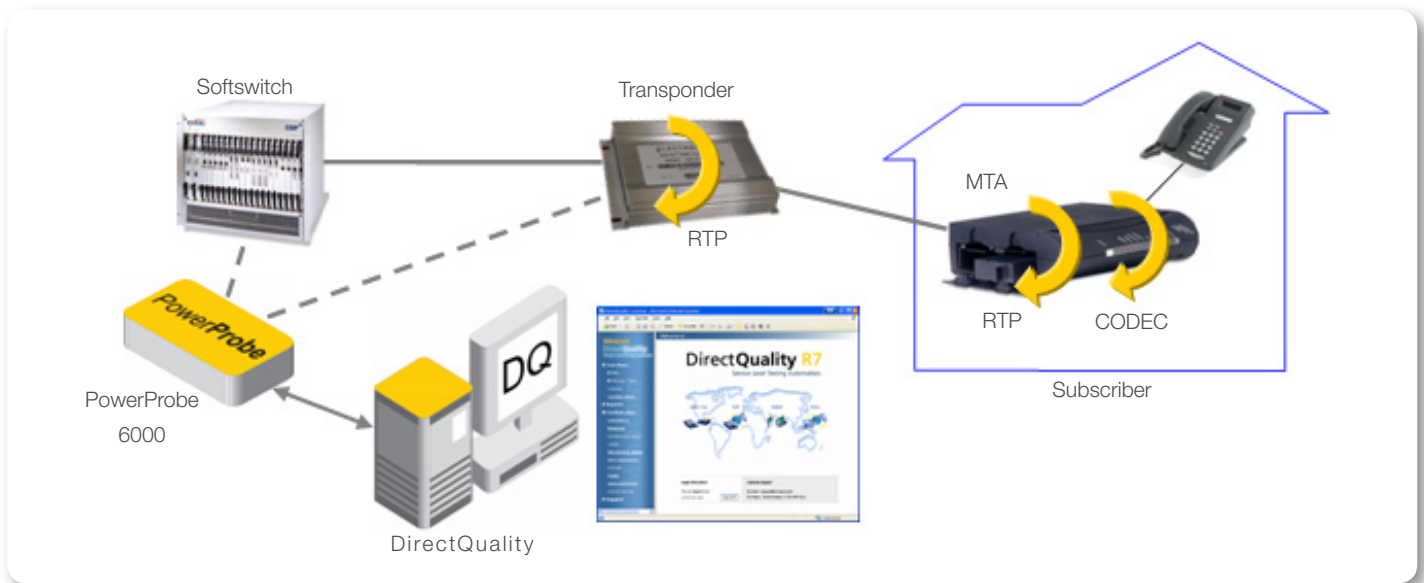
Support

Interactive Test Agent Zoey provides valuable subscriber QoS information to your customer support staff

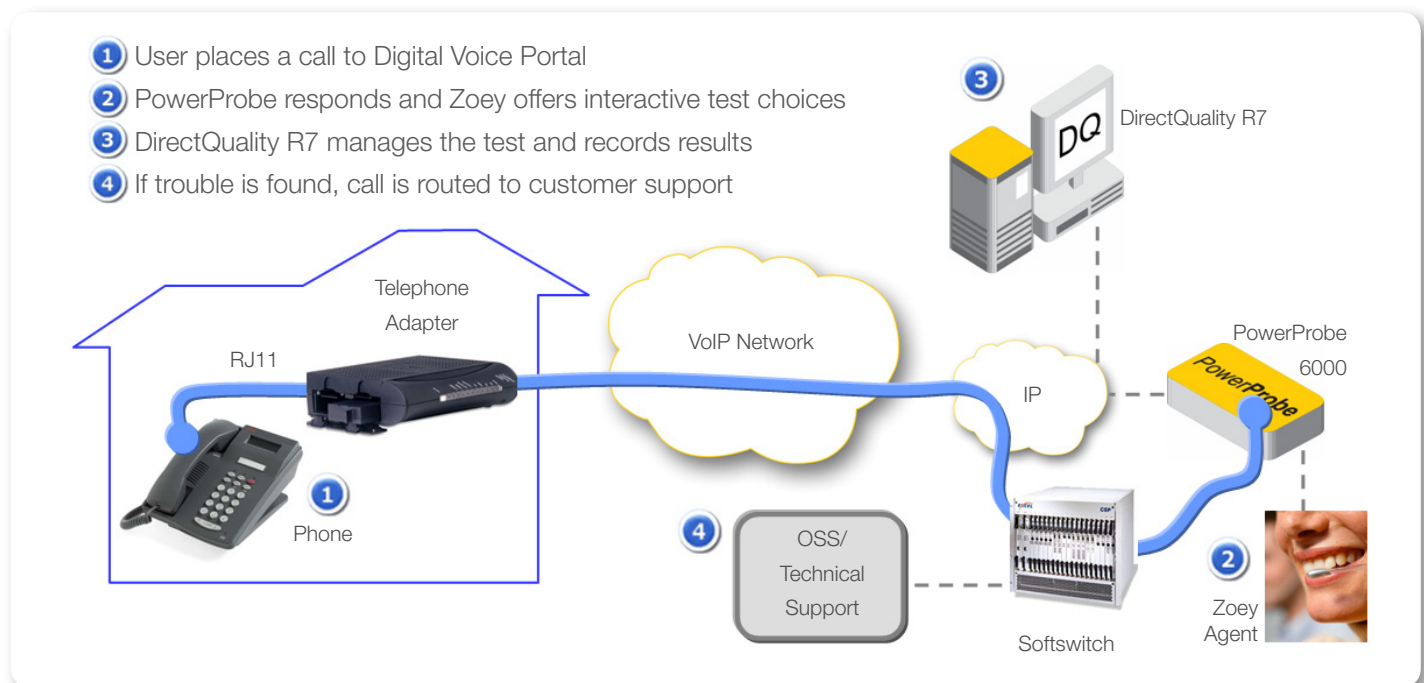
QoS Testing Without Far-End Probes



Integration with leading system and component manufacturers allows DirectQuality R7 to conduct voice and RTP/IP loopback tests to CATV transponders and subscribers' MTAs, dramatically reducing technicians deployment for most common service issues.



Tektronix' unique interactive test agent, Zoey, helps customers calling your support line quickly assess their own service quality issues by guiding them through a series of tests – providing complete data to your call center staff for quick problem resolution.



The screenshot displays the DirectQuality Test Management interface. On the left, the 'Test Plans' section shows a list of test plans with columns for Name, Status, Action, Time, Maximum, Label, and Duration. Below this, the 'Test Plan Properties' window is open, showing details for a test plan named 'France Telecom PESQ Tests'. The 'Test Type' section lists various test types like 'PESQ listening quality' and 'PSTN (Bell) #1'. On the right, the 'Voice Quality Evaluation Global User Perception Report' is shown, featuring a table of test results with columns for Call ID, Date, Time, and various performance metrics. A 'Threshold Manager' window is overlaid on the report, showing 'Add Thresholds' for 'Call Completion Ratio' with a threshold of 6. A blue arrow points from the report to the threshold manager.

Threshold any QoS Metric

DirectQuality Test Management

Advanced Test Automation

DirectQuality anticipates measurement requirements and will generate and execute testing plans based on your QoS objectives. Automate test plans or start tests as required.

Color-coded Service Levels

DirectQuality simplifies the monitoring of service faults by displaying results using user-definable Service Level Classes. Service violations can be forwarded to fault management systems via SNMP.

Business-level QoS Reports

DirectQuality provides a set of business-driven report templates with high-level and drill-down views.

QoS Reports Include:

- ▶ Call Connection Performance
- ▶ Perceptual Evaluation of Speech Quality (PESQ)
- ▶ Voice Quality Evaluation (IVR / VQES)
- ▶ E-Model Analysis
- ▶ RTP Performance
- ▶ Modem Performance
- ▶ Fax Connection Performance
- ▶ Fax Transmission Performance (ITU-T)
- ▶ IP QoS
- ▶ Video quality

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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