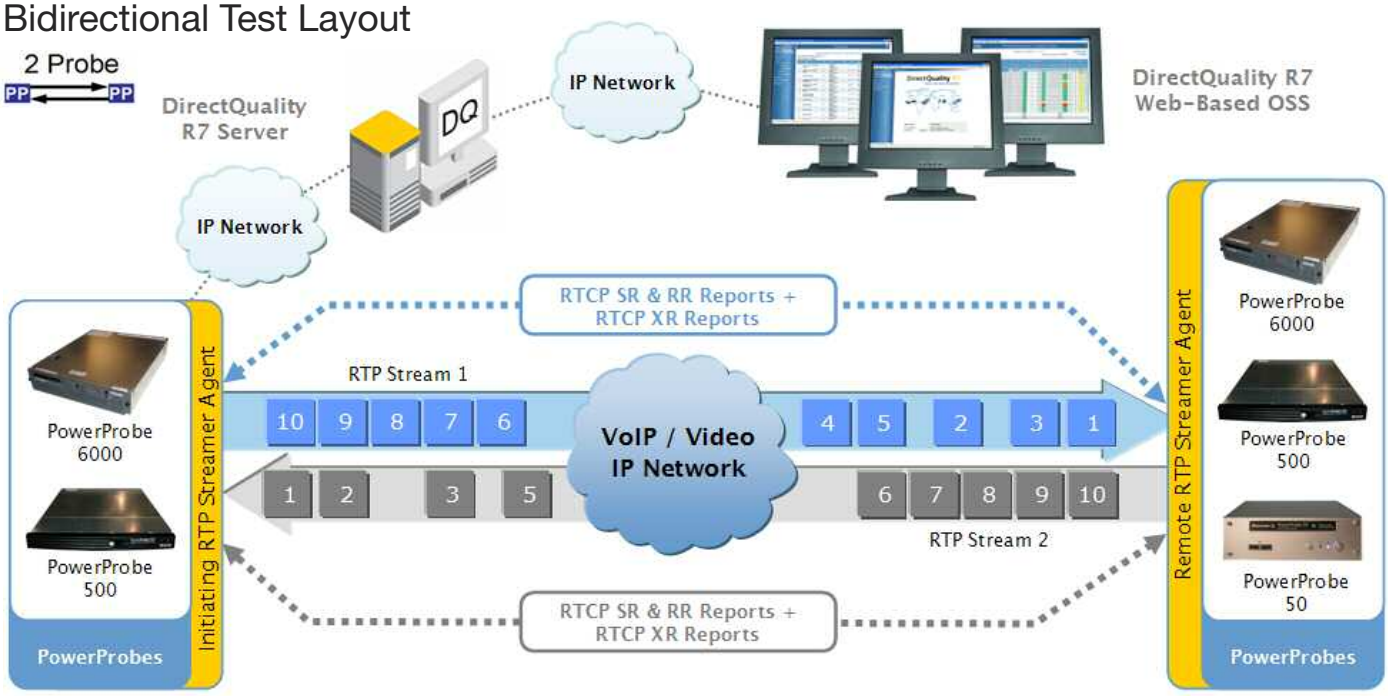
RTP Streamer & Loopback v3.0

Active Service Assurance

Bidirectional Test Layout



Bidirectional testing provides instant comparisons between endpoint measurements to support rapid problem diagnosis.

Overview

The RTP Streamer PowerProbe Test Agent provides active IP-Video and VoIP media quality and transmission performance testing over actual media-delivery infrastructures.

Real-Time Transport Portocol (RTP) is used to transmit IPTV, Video-on-Demand (VoD), VoIP and other real-time media over IP networks. Minacom's RTP Streamer test agent accurately simulates these media streams by supporting over 50 different audio and video codecs, including the lastest wideband VoIP, HDTV & IPTV standards.

The RTP Streamer test agent analyses RTP test streams and measures packet loss, jitter, delay and other IP impairments based on RTP packet statistics at the remote end using Real Time Control Protocol (RTCP). The RTP streamer agent returns RFC-3611 compliant RTCP extended reports (XR), as well as RTCP Receiver / Sender Reports which can be detected and used by third-party passive monitoring systems.

Integration with Tektronix' award-winning Integrated E-Model implementation, which incorporates both analog and IP measurements in calculated results, provides R factor, MOS, and other industry-standard service-quality metrics.

User-definable VLAN, DiffServ, Type of Service (ToS), and jitter buffer parameters ensure test streams closely replicate live traffic. Streams can be sent in concurrent bidirectional or loopback test configuration, in one-to-one or one-to-many (broadcast-style) test execution.

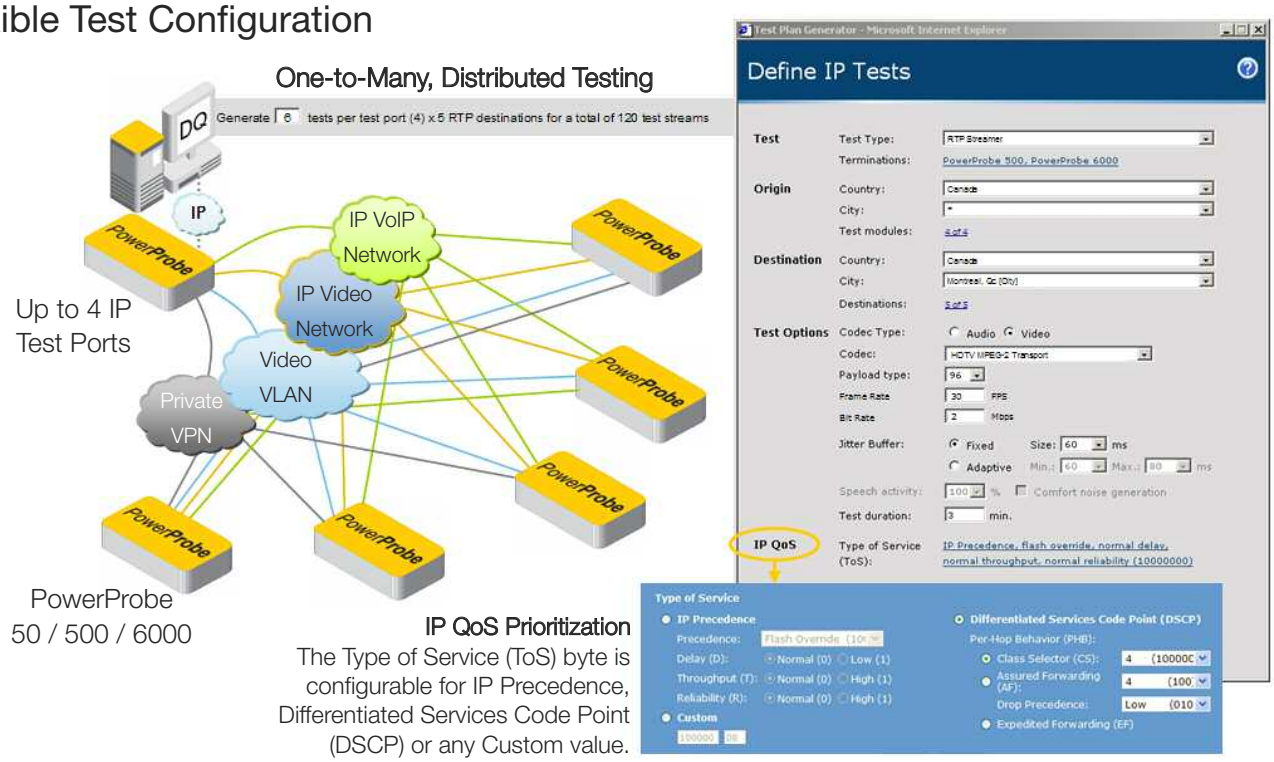
Product Name:

- ▶ Validate IP-Video & VoIP media quality using Tektronix' Integrated E-Model
- ▶ Integrated support for RFC-3611, RTCP Extended Reports (RTCP-XR)
- ▶ Conversational and listening quality metrics for speech analysis
  Concurrent bidirectional or loopback testing
- ▶ Digital and HDTV, narrowband & wideband VoIP codec support
- ▶ User-defined media / packet priority with configurable IP ToS, DiffServ + IP Precedence
- ▶ 802.1Q VLAN support for video trunk and multimedia testing over provider-defined transport LANs

Tektronix®
Enabling Innovation

Enabling Next-Generation Network Innovation

Flexible Test Configuration



IP QoS Prioritization

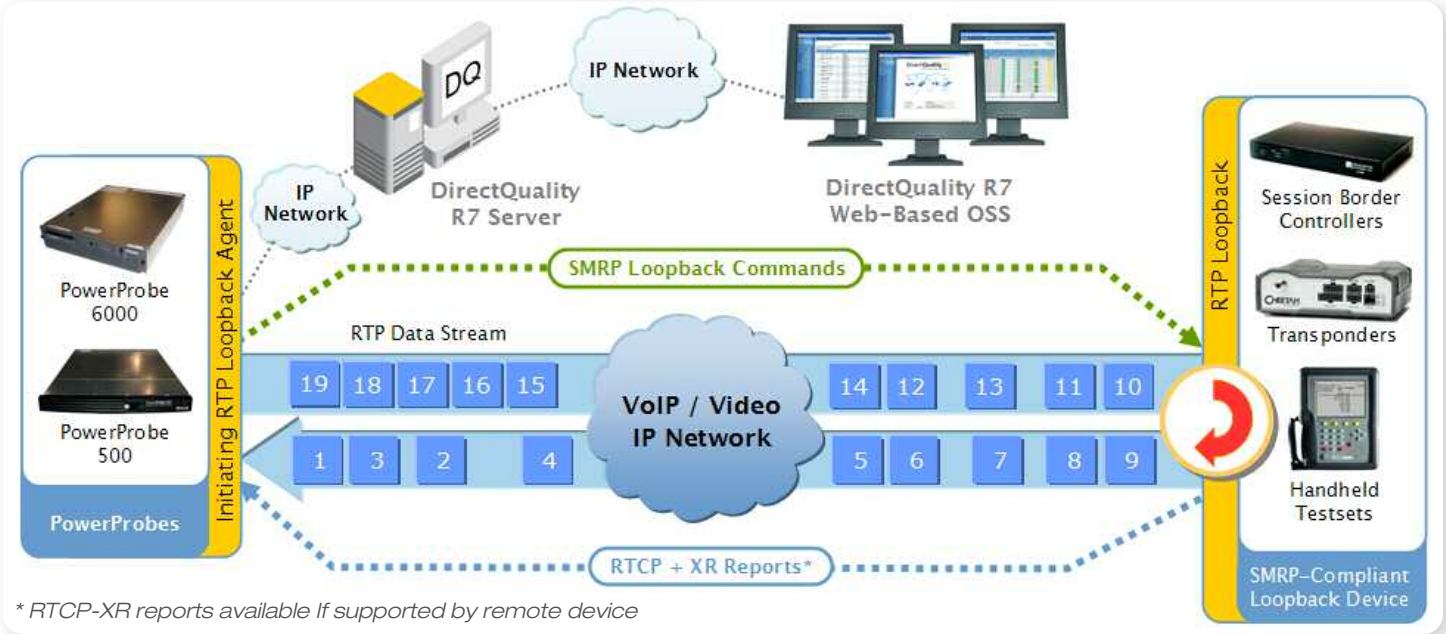
The Type of Service (ToS) byte is configurable for IP Precedence, Differentiated Services Code Point (DSCP) or any Custom value.

RTP Loopback Agent Test Layout

No Remote Probe Required!

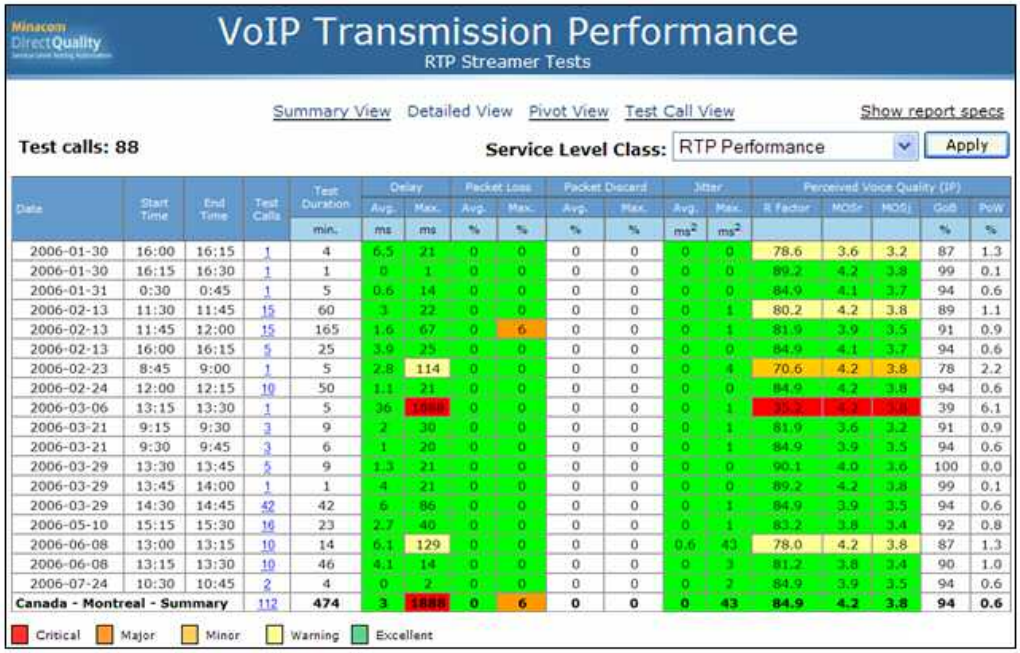
Loopback

RTP loopback testing allows you to test media quality using a variety of remote devices as test reflectors – including session border controllers (SBCs), OEM handheld testsets and cable transponders supporting the SMRP protocol. Results report the same, complete set of measurements as the RTP Streamer agent.



** RTCP-XR reports available If supported by remote device*

WEB-Based Reports



Minacom DirectQuality

VoIP Transmission Performance

RTP Streamer Tests

Summary View | Detailed View | Pivot View | Test Call View | Show report specs

Test calls: 88

Service Level Class: RTP Performance [Apply]

Date	Start Time	End Time	Test Calls	Test Duration	Delay Avg.	Delay Max.	Packet Loss Avg.	Packet Loss Max.	Packet Discard Avg.	Packet Discard Max.	Jitter Avg.	Jitter Max.	Perceived Voice Quality (IP) R Factor	MOSr	MOSj	GoB	PoW
				min.	ms	ms	%	%	%	%	ms²	ms²				%	%
2006-01-30	16:00	16:15	1	4	6.5	21	0	0	0	0	0	0	78.6	3.6	3.2	87	1.3
2006-01-30	16:15	16:30	1	1	0	1	0	0	0	0	0	0	89.2	4.2	3.8	99	0.1
2006-01-31	0:30	0:45	1	5	0.6	14	0	0	0	0	0	0	84.9	4.1	3.7	94	0.6
2006-02-13	11:30	11:45	15	60	3	22	0	0	0	0	0	1	80.2	4.2	3.8	89	1.1
2006-02-13	11:45	12:00	15	165	1.6	67	0	6	0	0	0	1	81.9	3.9	3.5	91	0.9
2006-02-13	16:00	16:15	5	25	3.9	25	0	0	0	0	0	0	84.9	4.1	3.7	94	0.6
2006-02-23	8:45	9:00	1	5	2.8	114	0	0	0	0	0	4	70.6	4.2	3.8	78	2.2
2006-02-24	12:00	12:15	10	50	1.1	21	0	0	0	0	0	0	84.9	4.2	3.8	94	0.6
2006-03-06	13:15	13:30	1	5	36	1888	0	0	0	0	0	1	55.2	4.2	3.8	39	6.1
2006-03-21	9:15	9:30	3	9	2	30	0	0	0	0	0	1	81.9	3.6	3.2	91	0.9
2006-03-21	9:30	9:45	3	6	1	20	0	0	0	0	0	1	84.9	3.9	3.5	94	0.6
2006-03-29	13:30	13:45	5	9	1.3	21	0	0	0	0	0	0	90.1	4.0	3.6	100	0.0
2006-03-29	13:45	14:00	1	1	4	21	0	0	0	0	0	0	89.2	4.2	3.8	99	0.1
2006-03-29	14:30	14:45	42	42	6	86	0	0	0	0	0	1	84.9	3.9	3.5	94	0.6
2006-05-10	15:15	15:30	16	23	2.7	40	0	0	0	0	0	1	83.2	3.8	3.4	92	0.8
2006-06-08	13:00	13:15	10	14	6.1	129	0	0	0	0	0.6	43	78.0	4.2	3.8	87	1.3
2006-06-08	13:15	13:30	10	46	4.1	14	0	0	0	0	0	3	81.2	3.8	3.4	90	1.0
2006-07-24	10:30	10:45	2	4	0	2	0	0	0	0	0	2	84.9	3.9	3.5	94	0.6
Canada - Montreal - Summary			112	**474**	**3**	**1888**	**0**	**6**	**0**	**0**	**0**	**43**	**84.9**	**4.2**	**3.8**	**94**	**0.6**

Critical | Major | Minor | Warning | Excellent

Generate detailed reports for monitoring, troubleshooting, SLA validation and trending with DirectQuality R7's web-based OSS.

Report by region for any period – low or peak traffic hours. Quickly isolate faults with color-coded service-level classification.

Supported codecs

VoIP (Narrowband)

ITU-T G.711 - mu-law
ITU-T G.711 - A-law
ITU-T G.723.1 - (6.3 kbps)
ITU-T G.723.1 - (5.3 kbps)
ITU-T G.726 - (16-40 kbps)
ITU-T G.728
ITU-T G.729
ITU-T G.729A
ITU-T G.729 + VAD
ITU-T G.729D
ITU-T G.729E
ESTI GSM Full Rate (FR)
ESTI GSM Enhanced Full Rate (EFR)
ESTI GSM Half Rate (HR)
GIBS iLBC
Comfort noise (CN)
DVI 4 bits
Federal Standard 1016
Linear audio 16 bits (L16)
Linear audio 8 bits (L8)
MPEG-2
QCELP (Qualcomm PureVoice)
Redundancy format (RED)
VDVI (Variable-rate DVI4)

TV Audio

MP2T (MPEG-2 Transport stream)
MP4T (MPEG-4 Transport stream)

Wideband VoIP

ITU-T G.722
ITU-T G.722.1
ITU-T G.722.2 / ETSI AMR-WB
ITU-T G.729.1

Digital TV

BMPEG (Bundled MPEG)
BT.656 - ITU-R digital
CellB - Sun Microsystems
ITU-T H.261
ITU-T H.263-2000
ITU-T H.263-1998
JPEG (Joint Photo Experts)
MP1S (MPEG-1 Systems)
MP1T (MPEG-1 Transport)
MP2P (MPEG-2 Program)
MP2T (MPEG-2 Transport)
MP4P (MPEG-2 Program)
MP4T (MPEG-4 Transport)
MPV (MPEG Video)
nv - XEROX video codec

HDTV

MP2P (MPEG-2 Program)
MP2T (MPEG-2 Transport)

Measurements

- RTP — Results from RTP Streamer Test Agent
- XR — Results Sent in RTCP-XR Reports

Delay

- Roundtrip Delay
- Roundtrip Delay Std. Dev.

Jitter

- Jitter
- Jitter Std. Dev.
- Nominal Max Jitter Buffer Size
- Nominal Min Jitter Buffer Size
- Min Jitter Buffer, Lowest Usage
- Min Jitter Buffer, Highest Usage
- Max Jitter Buffer, Lowest Usage
- Max Jitter Buffer, Highest Usage

Packet Loss

- Jitter Buffer Packet Loss Rate
- Packet Loss Ratio
- Packet Loss Std. Dev.

Signal

- Received Signal Level
- Noise Level

Packet Transmission

- Bytes Received
- Packets Received
- Packets Out-of-Order
- Packets Out-of-Order Ratio
- Packets Out-of-Order Std. Dev.
- Packets Sent
- Packets Discarded
- Packet Discard Ratio
- Burst Duration
- Gap Duration
- Burst Density
- Burst Density Std. Dev.
- Burst Gap
- Burst Gap Std. Dev.

Calculated Metrics

- MOS LQ (Listening Quality)
- MOS CQ (Conversational Quality)
- R factor (CQ + LQ)
- Wideband R factor (CQ + LQ)
- Wideband MOS (CQ + LQ)

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

Contact Tektronix:

Please visit
www.tektronix.com/
communcations

Phone:
1-800-833-9200 option 1
+1-469-330-4000
Active Test Office:
(514) 380-5530

Locate your nearest
Tektronix representative
www.tektronix.com/contactus

Tektronix®
Enabling Innovation

01/07 GD

CCW-20721-1