



Quality Intelligence Solutions



## A World of Challenges

### **It's a Technical World**

Service providers are striving to launch breakthrough technologies and expand core infrastructure. Ensuring services work flawlessly from trials to in-life adoption requires real-time technical insight that covers the expanses of the whole network - true end-to-end quality intelligence. Clearly understanding the actual value achieved from technology investments is essential for managing today's performance and tomorrow's direction.

### **It's a Consumer World**

It's not just about speed. Consumers are now demanding applications from basic email to "media-on-demand" that meet their growing expectations for reliability, accessibility and cost. And with IP media content set to be the next wave in IP communications, service providers can only expect consumers to demand "right here, right now" broadband connectivity.

### **It's a Competitive World**

You're not the only one launching new services and seeking new subscribers. Benchmarking intelligence of other service operators is vital for understanding your competition and managing your market growth. Having access to real-time data on speeds, coverage and the technical capabilities of your competitors across the country is the advantage you need.



## Epitiro - Quality Intelligence Solutions

Epitiro provides real-time performance intelligence to help you manage your network, meet customer experience quality targets and control resources. By measuring end-to-end quality - fully to the subscriber's smartphone or computer - our quality intelligence solutions provide both network performance and customer experience.

And it's not just your network and customers - our solutions easily scale to monitor the network performance and subscriber experience of all your competitors.

### **QoS - Network Quality of Service**

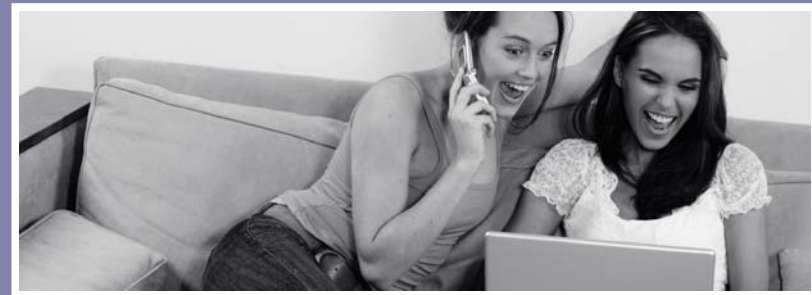
"How well does the network perform?"

Our end-to-end test solution monitors quality of service 24 x 7 to provide comprehensive insight into the technical capabilities of networks. All points from the core network to the last mile to the very edge - your customer - can be monitored to enable you to proactively address subscriber-affecting faults, ensure new services are successfully launched and effectively manage wholesale bandwidth consumption.

### **QoE - Customer Quality of Experience**

"What is the actual experience of subscribers?"

Epitiro also provides you with insight into the most important aspect of service delivery - the customer experience. By measuring directly from a subscriber smartphone or computer, customer experience data is available for analysis of your whole base or just a single subscriber.



## Who Can Benefit from QoE and QoS Intelligence?

Internet Service Providers and Mobile Network Operators use our quality intelligence to manage network performance, customer experience and third party service. The benefits of real-time, end-to-end quality intelligence can make an impact throughout your company;

**Call Centre Agents** can use customer experience data to address subscriber complaints while **Customer Experience Managers** look at overall performance to ensure quality targets are achieved.

Subscriber-affecting network are readily seen and prioritised by **NOC Engineers** via access to real-time data that stretches to the last mile.

**Capacity Planners** can readily control wholesale bandwidth consumption and intelligently re-allocate bandwidth where and when it is required while **Network Planners** can use empirical data to fully understand where services warrant expansion.

Better than the competition? **Marketers** can use QoE data as the basis for substantiating marketing campaigns.

And perhaps most of all, **Senior Executives** can simply 'see' network quality across the entire country - or right down to a single customer.



Call Centre Agents



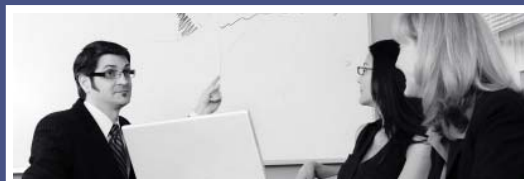
NOC Centre



CEM Manager



Marketing



Capacity Planners



Senior Executives



Network Planners

## Analysis of Technical Parameters and Applications

Epitiro's solutions analyse applications from a 'whole experience' viewpoint and provide the underlying KPI metrics required to identify faults and troubleshoot services. In addition to technical metrics, it's critical that popular applications such as web surfing and email be analysed to truly understand any network issues that lead to unsatisfactory customer experience.



**Voice:** Comprehensive analysis of your entire telephony infrastructure including VoIP Phones, VoIP soft clients, Mobile and PSTN services



**Video:** A definitive service assurance solution to monitor the performance of streaming IPTV and video including preferred traffic streaming analysis



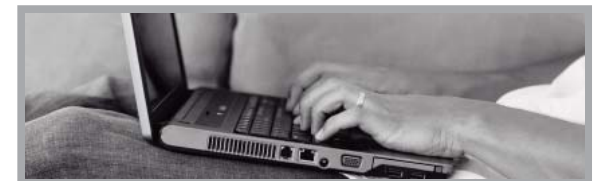
**Web Surfing:** Critical web page download times (including DNS and HTTP Latency) are recorded as is the connectivity to the world's most popular sites



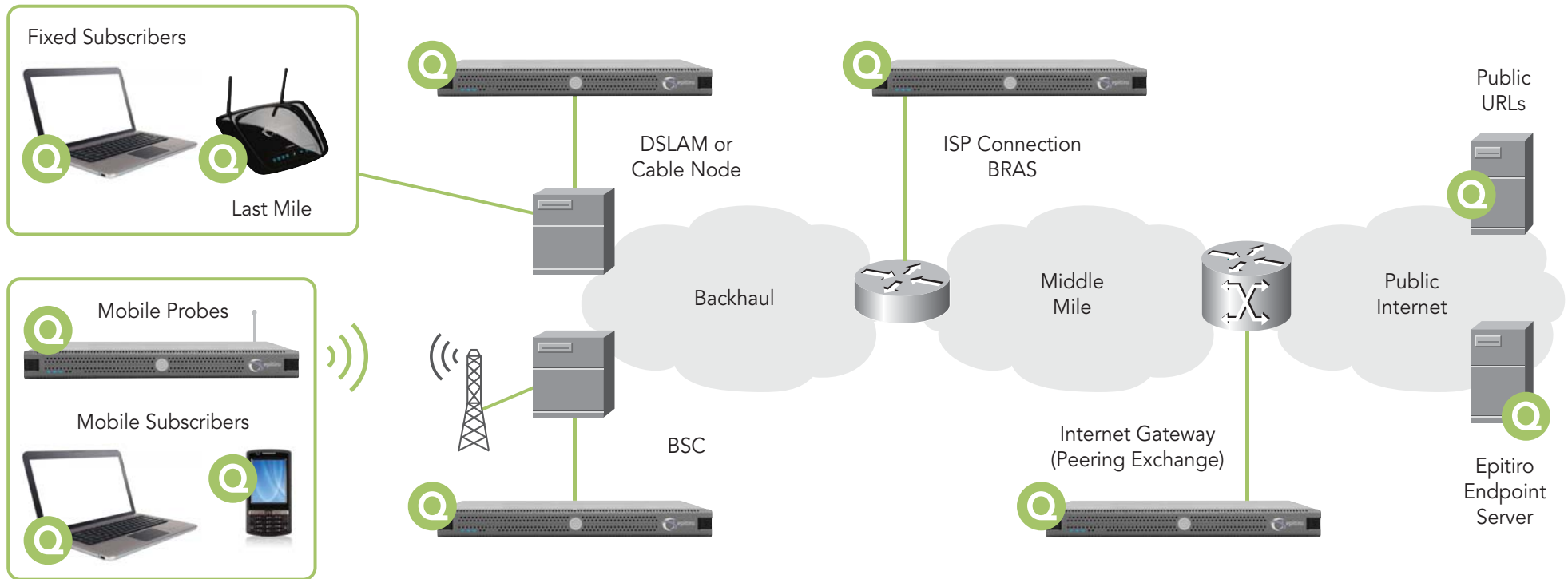
**On-Line Games:** Popular game emulation traffic is used against real game servers to measure performance, along with latency measurements taken from TCP round trip times



**Media Downloads:** Real MP3, programme files and other data is downloaded from national and international locations for an understanding of network speeds and peering



**Email:** Email round-trip testing across your own and third-party email platforms to ensure that incoming and outgoing services work reliably



## End-to-End Testing

Our end-to-end quality monitoring solutions are truly that. We test from the very edge of the networks – where the customers are – and key aggregations points in between. Using a variety of data collection probes our **ISP-IT™** and **ipQ™** dashboards put vital quality of service and quality of experience information at your fingertips.

# ISP-ITM - Network Quality Management

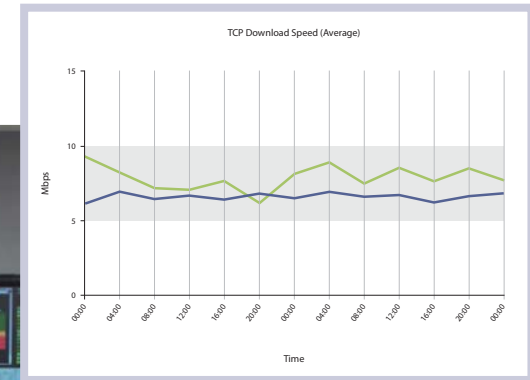
The ISP-ITM broadband analysis solution gives service providers with a flexible, scalable test and reporting solution for understanding network performance of internet service and applications. Virtually any of the industry's access technologies - ADSL, FTTX, Cable, 3G and WIMAX - can be tested to assist with network management and gather competitive intelligence across all available services.

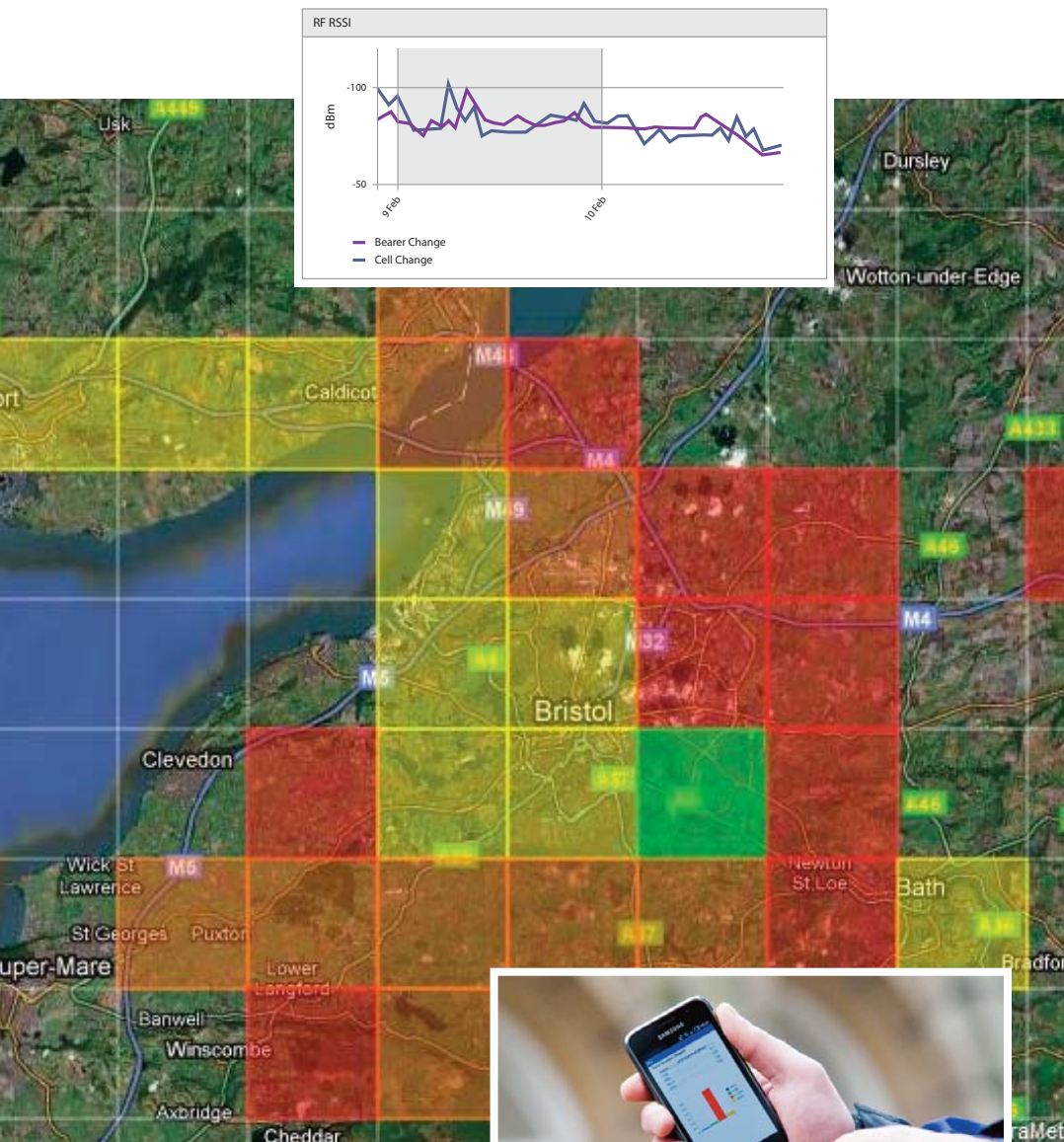
With a host of Key Performance Indicators, on-line views of metrics and the ability to automatically generate fault alerts and reports, ISP-ITM is the complete broadband analysis solution for fixed and mobile operators.

The ISP-ITM platform consists of a deployment of 'probes' that act as typical subscribers by connecting to the broadband network and performing routine tasks such as web surfing, media downloading, sending emails, on-line game play, VoIP telephony and streaming videos.

Key Performance Indicator (KPI) metrics are recorded throughout the test sessions and results are forwarded to a central database where you can see quality statistics via the On-line Dashboard in a variety of graphs, tables and charts.

Probes can be located across a country or region of interest to test your network and the networks of your competitors.





## ipQ™ - Subscriber Experience Analysis

ipQ™ is a scalable end user device-based broadband measurement solution that finally allows network operators to 'see' IP service quality as experienced by fixed and mobile customers. Using software probes that download to smartphones and PC's, ipQ™ provides real-time insight into the performance of services from a customer viewpoint.

For mobile networks, both radio (coverage) and IP performance is measured from Android-based smartphones or PC's equipped with dongles. No other solution available today matches this ability to understand all aspects of mobile broadband.

Fixed network operators can readily see 'past the CPE' and understand how services are experienced in the home to PC's that are wired or connected via WiFi. Used for network management or solving a single subscriber's fault, ipQ™ puts quality of experience data at your fingertips.

ipQ™ easily scales to provide national coverage and information about service quality that is out of reach with conventional testing and measurement methods. Software test apps are downloaded over the web to potentially thousands of subscriber 'test points' to quickly create a substantial database of your network - and your competitors. Powerful geo-spatial maps, charts and graphs can be generated in the on-line dashboard or data can be exported.



## Data Collection Probes

A range of measurement models and probes is available for use in various fixed and wireless testing scenarios including national benchmarking, network management, new service testing and device analysis.



**ETP1 End Point Test Server:** Interacts with the full suite of Epitiro probes for TCP Throughput, Traffic Management, VoIP and Voice Quality tests.

### ipQ™ Quality of Experience Probes



**AT50:** Windows software probe measures fixed or mobile (dongle) broadband KPIs directly from a PC. Easily scales for mass deployment.



**AT50M:** Software probe downloads from the Android App store to smartphones and measures mobile broadband services. Scales for national coverage.

### ISP-IT™ Quality of Service Probes



**AT100:** Quality of Service KPIs directly from customer CPE. Identifies issues in the local loop, last mile and end-to-end network quality.



**AT200:** Installs into core network locations to capture broadband performance data at exchange points, gateways and the BRAS.



**AT400:** Epitiro's most advanced monitoring probe for complete voice, video and data analysis.

## Quality Performance Metrics

Epitiro's analysis of fixed and mobile QoS and QoE is extensive and includes KPIs on popular applications and the underlying technical metrics. Beyond IP network testing tests can be configured for analyse Traffic Management, Net Neutrality, IPv6 and Advanced Voice telephony performance.

Here is a sample of metrics and ancillary information collected.

### Broadband Performance Metrics

Download Speed

Upload Speed

UDP Streaming

Network Latency

Network Packet Loss

Network Jitter

Transparent HTTP Content Compression Ration

Web Browsing Speeds

DNS Performance

Failure Rates

Network Availability

### Fixed Network Metrics

IP Address

ISP

Package Cable / ADSL

### Radio Access Network Metrics

Location Area Code (LAC)

Cell ID

LAC

Received Signal Strength

Access Protocol

GSM BERT

Neighbouring Cell Info

### Application Performance Metrics

VoIP Quality (E-Model)

PSTN/Mobile Voice Quality (PESQ)

Video Streaming Quality

Gaming Performance

Email Reliability

Network Packet Loss

Network Jitter

Web Browsing (HTTP) Cached & Uncached

Video Streaming ITU G.1070 & RFC4445 (MDI)

### Location Information

Physical Address

Latitude (GPS)

Longitude (GPS)

UTC Timestamp

Altitude

Speed

Bearing

## Epitiro around the world

Epitiro monitors the performance of fixed and mobile broadband services around the globe and collects data in over 40 countries.

Leading service providers such as BT, Virgin Media, Orange, Saudi Telecom Corporation and more use our solutions to manage network quality and customer experience. We're proud to name regulators and industry advisors as clients including Ofcom, the GSMA, Singapore IDA, the OECD, New Zealand Commerce Commission and others.

The outlook and requirements of our international clients extensive contributes directly to our solutions development - ensuring our clients benefit from the ever-growing community of knowledge.



## Quality Intelligence

For over a decade EpiTiro has been providing regulators, mobile operators and internet service providers with solutions for understanding network quality and true customer experience.

More than just tools that collect measurements, our solutions turn data into intelligence with bespoke dashboards, alerting and reporting capabilities. Behind our technology is a dedicated analysis and support team that is there to advise on demand or supply a fully outsourced service.

To find out more about how our quality intelligence solutions can benefit your company, contact EpiTiro.

We're ready to help you measure, manage and deliver.



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