QiTASC

the magic of E2E testing

The revolution in international roaming & interconnect testing

We implement roaming tests globally.

Global testing | Automated software | Remote access | Hardware

www.qitasc.com
info@qitasc.com
+43 1 810 21 73
+49 211 158 04134
Wagenseilgasse 14/Top 1
1120 Vienna, Austria

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This document is intended for global network operators and introduces our solution for global roaming tests.

The offer

A centralized setup with remote control

QiTASC offers an innovative, lean test automation solution for global roaming tests.

Our international roaming testing service is uniquely designed to set a new industry standard with real-device testing across multiple countries. It provides unparalleled accuracy and reliability from the get-go. Our pioneering solution outshines all other solutions on the market and propels your business to the forefront.

Testing mobile to backend:

Comprehensive coverage of test automation from mobile devices through to backend systems, ensuring end-to-end validation of telecom services.

Easy-to-use software:

Our user-friendly testing framework uses simple, conversational English for script writing, making it easy for your team to set up and execute tests without deep programming knowledge.

Global operation:

Configurable to operate in over 100 countries, providing a versatile tool for global telecom operators.

Diverse technologies:

Supports testing across 2G, 3G, 4G, 5G NSA, WiFi and 5G SA networks, covering a broad spectrum of telecom technologies.

Remote interaction:

Being able to control devices remotely is invaluable for test development. Testers can manually interact with a device to explore or replicate specific scenarios, then automate those interactions in test scripts.

This feature is especially useful for detailed interactive sessions and troubleshooting.

Flexible usage:

QiTASC offers both an IntelliJ-based IDE and a secure web interface for developing and managing test cases and projects. This integration provides a robust environment for script creation and project management, enhancing productivity and user experience.

Scalability:

Our modular architecture easily adapts to new technologies, ensuring your testing capabilities remain cutting-edge without extensive overhauls. Designed to scale horizontally, it meets growing network demands without performance compromises.

Secure testing:

Enhanced security protocols such as mTLS and certificate management secure testing operations.

Audio testing:

Incorporating tools like OOKLA, POLQA and VisQol enables precise audio quality testing and data service testing within test cases. This is essential for validating voice & data services and other audio-dependent features, e.g. network announcement verification in telecom services.

Intuitive reporting:

Robust reporting tools that offer customizable logs and result visualization aid quick decision-making.

Accuracy:

Achieve unmatched testing accuracy with our support for both simulated and real mobile devices, ensuring your network performs optimally under all conditions.

Automated verification:

QiTASC enhances test case development with automated verification capabilities, such as automated CDR verification, which automatically compares charge data records against expected results. This reduces manual verification tasks and increases the accuracy and reliability of test outcomes.

Easy scripting:

QiTASC uses a layered architectural approach that facilitates the development of test cases across different technologies and platforms. This structure supports the separation of test logic from implementation details, which helps to maintain clean and efficient test scripts.

Easy integration:

Easily integrates with open-source tools, enhancing utility and reducing operational friction.

Secure environment:

Secure and isolated environments for multiple clients in a single instance, ensuring data integrity and operational security.

No interruptions:

The framework runs independently of GUI changes, which allows tests to run uninterrupted even with updates to the user interface of the tested software.

Handling of multiple SIMs:

Efficient handling of thousands of SIMs through advanced SIM management features and seamless integration with SIM multiplexers and eSIM platforms.

Regular releases:

Agile development process with bi-weekly software releases, ensuring the framework always keeps pace with the latest technological advancements.

Dynamic adaptation:

Testers can dynamically adjust environment variables, making it easy to adapt test cases to different testing conditions without altering the core script, e.g. APNs, SMSC addresses, etc. This flexibility is crucial for efficient testing across multiple configurations, countries, and scenarios.

Verification for accuracy:

Automated verification of charge data records against predefined rules ensures billing accuracy.

Management features:

The framework includes advanced features for managing SIM cards and mobile devices, which are integral to test case development in telecommunications. This integration allows for sophisticated scenarios involving multiple SIMs and devices, providing a more realistic testing environment.

Future development:

The framework architecture is designed to be extensible, allowing easy incorporation of new technologies and protocols. This means that as telecommunications evolve, so too can the test cases without extensive overhauls or compatibility issues.

Why it is important

Connect globally, roam with confidence

Ensure your world is always within reach. Experience effortless maintenance with our roaming service. It streamlines your operations and provides precise, comprehensive KPIs that directly reduce costs and improve customer satisfaction.

Our solution to common roaming problems:

How to meet the growing demand for seamless international mobile connectivity.

As global travel increases, the demand for seamless international mobile connectivity grows. Travellers expect to use their mobile devices anywhere without interruptions or connectivity issues. This necessity drives mobile network operators to ensure their roaming and interconnect services are reliable, which in turn fuels the demand for thorough roaming and interconnect testing.

⇨ **The QiTASC solution:** Real devices across numerous countries allow all typical human interactions with mobile devices to be replicated and tested, ensuring unparalleled performance reliability and cost/performance ratio.

The complexity of compatibility and smooth operation across diverse mobile networks worldwide.

Numerous mobile operators worldwide have to ensure compatibility and smooth operation across their diverse networks. Each one has different technologies and standards. This is complex!

⇨ **The QiTASC solution:** Our roaming testing service identifies and resolves issues that arise when networks interact, which is essential to ensure flawless connections across different networks.

The many regulatory requirements.

Mobile operators often face strict regulatory requirements regarding service quality and fraud prevention.

⇨ **The QiTASC solution:** As a roaming testing company, we help operators comply with these regulations by ensuring that their services operate correctly and securely worldwide.

Varying roaming quality due to other networks' changes.

If a partner's network quality deteriorates, operators can update their preferred network list OTA to steer users to better-performing networks.

⇨ **The QiTASC solution: Regular IR testing** allows operators to assess their partners' service quality and make informed decisions about which networks should be preferred or avoided.

To maintain a high-quality customer experience.

To maintain a high-quality customer experience while roaming, their mobile phones should not connect to low-quality networks, which may result in disrupted connectivity or poor data speed.

⇨ **The QiTASC solution:** We update roaming lists dynamically OTA, which ensures that customers are always connected to the best available network. This minimizes issues like dropped calls, poor data speeds, and other connectivity problems.

Picking the right moment to modify operational agreements and preferences.

Operators need to be flexible about modifying operational roaming agreements and preferences when they want to. The problem lies choosing the right moment to modify anything.

⇨ **The QiTASC solution:** Real-time testing results and updated quality assessments give operators a basis for making decisions. Easy-to-follow analysis makes them more flexible so they can adapt quickly to new market conditions, regulatory changes, or shifts in network performance.

The need to adapt roaming partnerships quickly.

Operators that can adapt their roaming partnerships quickly maintain high service quality. They can stand out in competitive markets. This adaptability can be a key selling point, particularly for customers who travel frequently.

What can be tested

Test areas covered by QiTASC

IR.24

International Roaming for GSM Networks:

IR.24 is focuses on international roaming between GSM networks. The main test cases for IR.24 would typically cover Registration and Authentication, Voice Calls, SMS/MMS, Supplementary Services, Data Services (GPRS/EDGE), USSD (Unstructured Supplementary Service Data), Roaming Tariff Information, Handover Scenarios, International Roaming Billing.

IR.25

GPRS (General Packet Radio Service) Roaming Exchanges:

IR.25 addresses the interworking aspects for GPRS (General Packet Radio Service) roaming exchanges, where GPRS subscribers can roam into other GPRS networks. The test cases focus on ensuring seamless service as users move from one network to another.

IR.32

Service Requirements for GSM Networks:

IR.32 is the GSM Association (GSMA) standard for the International Roaming Testing of GSM and UMTS networks. It outlines the requirements for ensuring that subscribers receive seamless service while roaming internationally. The test cases should cover the fundamental functionalities related to voice, data, and supplementary services across different networks.

IR.35

Fraud Information Gathering System (FIGS):

IR.35 pertains to the Fraud Information Gathering System (FIGS), which is a framework established to collect and share fraud-related information among operators to mitigate fraudulent activities in international mobile roaming. Test cases for IR.35 should focus on validating the functionality of the fraud prevention and detection systems as well as the information exchange mechanisms.

IR.38

International Roaming for IMT-2000 Systems:

IR.38 focuses on International Roaming for IMT-2000 Systems, addressing aspects critical for ensuring seamless interoperability and service provision for 3G networks across different operators internationally.

IR.50

International Roaming for LTE and Evolved Packet Core (EPC) Networks:

IR.50 focuses on International Roaming for LTE (Long Term Evolution) and EPC (Evolved Packet Core) networks, covering essential aspects for ensuring seamless LTE roaming services.

IR.60

IMS (IP Multimedia Subsystem) Roaming and Interworking Guidelines:

IR.60 focuses on the guidelines for IMS (IP Multimedia Subsystem) roaming and interworking, which is critical for delivering consistent and high-quality multimedia services across different networks internationally.

IR.81

IMS Roaming and Interworking Guidelines

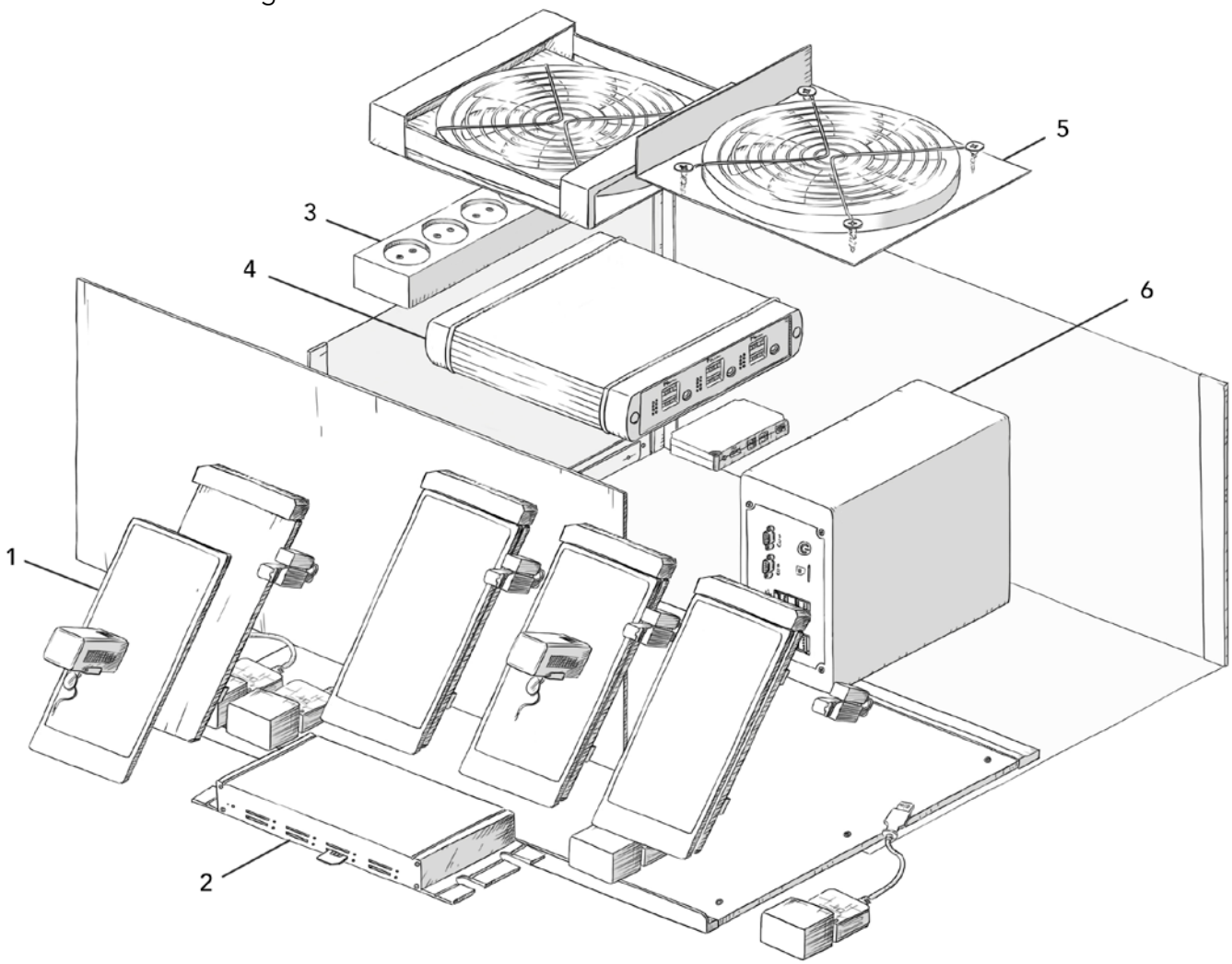
IR.81 outlines the test methods, implementations, and threshold values for measuring the quality of roaming services.

How it is done

The QiTASC box for international roaming tests

The QiTASC box revolutionizes remote testing with a suite of devices designed for unparalleled control and troubleshooting. For us, remotely managing our equipment is easy: We switch devices on or off, power equipment up or down, or do audio recording.

To perform international roaming testing, we place various QiTASC boxes at previously defined locations globally. These boxes contain needed to run end-to-end tests: Remotely accessible hardware with preinstalled software which does the magic.



1 **Mobile devices:** Different brands and OS versions in 3D-printed housings. Connected to a SIM multiplexer or SIM connector.

2 **Local SIM multiplexer**

3 **PIKUM and power bar:** Remote power switch & remote PC control

4 **Phone hub:** Audio support, security features, evidence control. Connection via USB (signal, power) and BT (audio)

5 **Fan**

6 **IPS:** intaQt gateway, security features, evidence collection

Where the QiTASC boxes are located

Below, you see a subset of supported countries:

The heart of any QiTASC box: intaQt framework & software tools

The heart of our operations is the QiTASC international roaming and interconnect platform. Located in Vienna (Austria), it provides a run time environment called intaQt which executes automated test cases that, which can be remotely controlled. Thus, intaQt forms the heart of the QiTASC boxes worldwide.

intaQt is supported by additional software to offer the full experience of end-to-end test automation. To name just a few.

It includes a smart resource manager and scheduler called sQedule, combined with a web-UI with easy secure (2FA) access and test case management. A tool named restriQt offers centralized user roles and responsibilities management. Test reports are maintained by conQlude. Advanced, automated verifications for CDR & trace verification are handled by cheQ and cdr-linQ.

Find out more online.

About us

Whom to trust in your race on the market

QiTASC
the magic of E2E testing

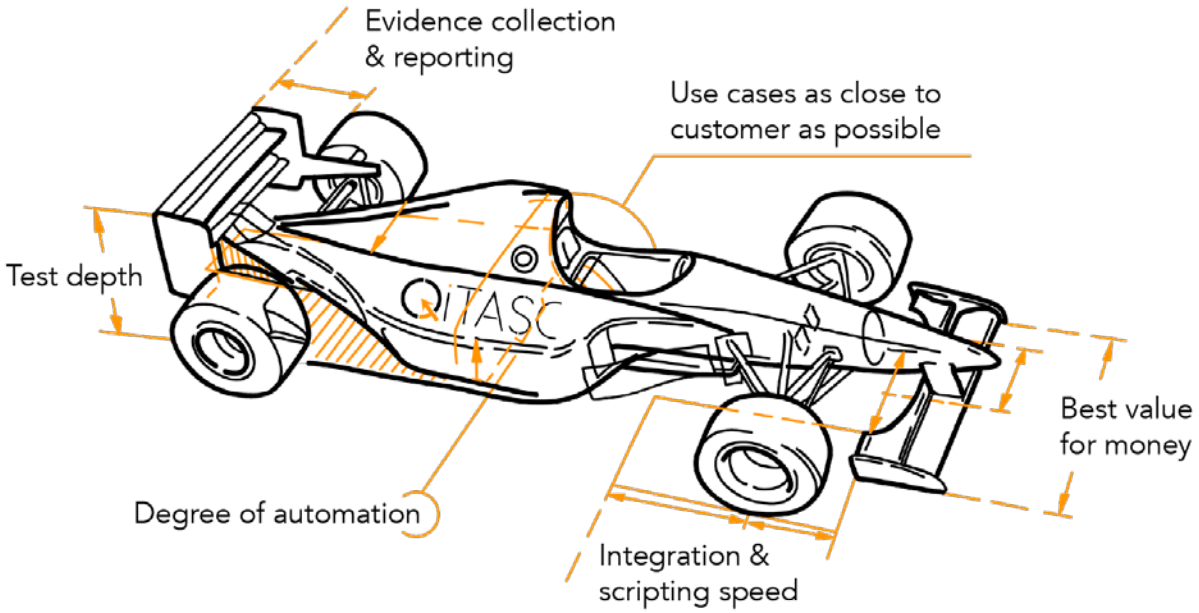
We are QiTASC, experts in end-to-end test automation.

Our all-in-one solution consists of modular software, remotely controllable hardware, AI, worldwide locations, and expert knowledge. With it, network operators can control and monitor their network from our centralized setup, using a single, user-friendly interface only.

By choosing the QiTASC test automation services, you empower your network with the tools and capabilities needed to maintain an international high-quality standard, deliver exceptional customer experiences, and stay ahead of the competition. With our belief that simplicity should never compromise the quality of results, you will discover how easy it is to achieve powerful testing outcomes.

T. Lammert, project manager Vodafone Germany:

"Using QiTASC's test automation services has revolutionized how we manage our international roaming tests, significantly enhancing our service quality."



The USP that sets us apart

Unique roaming testing service

We empower your network with precision and agility using our comprehensive roaming testing services. They ensure that every interaction is flawless and every connection seamless. We tailor your tests effortlessly across diverse projects and ensure every critical mobile feature is thoroughly evaluated: from voice calls, SMS/MMS, and USSD to data, apps, and telco services.

Remote defect diagnosis

When issues arise, our instant testing capabilities allow for swift defect resolution by remotely diagnosing device behaviour in real time.

AI verification

Plus, our AI-powered rule generation meticulously verifies all basic protocols, including 3GPP, ETSI, and RFCs. It ensures your services are not only compliant but also leading-edge.

Dashboard visualization

Beyond automated testing, our solution offers dashboarding capabilities. This makes it easier for you to keep a watchful eye on your network's performance.

KPI provided

Our advanced KPI collection integrates seamlessly to provide you with actionable insights. To do this, it sources data directly from the mobile devices, applications, and even during fundamental RAN communications.

Hardware to allow global testing

Innovative hardware that complements our testing software. It enables us to develop products such as the QiTASC box to place small but effective testing labs all over the world.

Fast development of individual solutions

Our size and mentality mean QiTASC can implement customer specifications quickly. This applies to both strategical and operational decisions.

Simple usage

With our solution, you'll experience the perfect blend of simplicity and sophistication, enabling you to streamline your testing procedures while achieving robust and reliable results.

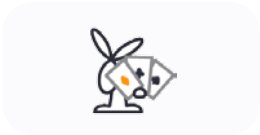
Pricing

Business model

The specific pricing strategy depends on three factors: The range of services offered, the complexity of the testing required, and the scale of the test. Here are some common elements of the business models offered by QiTASC.

Flat fee model

We offer a flat fee for a comprehensive package of services. This includes a set number of test cases, monitoring, and reports over a specified period.

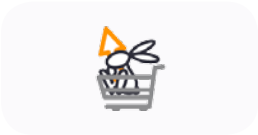


Per test case model

This model charges operators based on the number of test cases they run. This is especially attractive for operators who don't require continuous testing but might need periodic checks, such as before launching in a new country or deploying new services.

Base fee plus usage fees

QiTASC charges a base fee for initial setup, access to testing tools, and basic services. Additional fees are then applied based on usage, which can include the number of countries tested, volume of testing data processed, or specific advanced testing services used.



Customized pricing models

Larger network operators or those with specific needs might require customized solutions, which can include a mix of all the above models tailored to their requirements. This might also involve strategic partnerships or long-term contracts with specific service-level agreements (SLAs).

Subscription-based models

Like flat fees, this model involves regular payments (monthly or annually) and provides ongoing services. It often includes continuous monitoring, regular updates, and immediate support, making it suitable for operators who need constant vigilance on their roaming capabilities.

Tiered service levels

Tiered pricing based on service levels is also an option. Basic packages offer limited testing and reports, while premium packages include extensive testing across multiple networks, detailed analytics, and dedicated support.

Benefits & conclusion

Conclusion: Redefining test automation standards for your benefit

At the heart of our mission are the relentless pursuit of excellence in test automation and our commitment to you, our valued partners, and customers. We are proud to set new benchmarks in automation and verification, driven by innovation and an unswerving dedication to meeting your unique needs.

Maximize your benefits

Unlock superior telecom performance with our pioneering framework.

Our framework is designed to be a game-changer in the telecom industry, offering efficient, lightning-fast, accurate, and reliable test automation with the following benefits:

- **Automated testing with little effort.**

  Streamline your operations with our platform, which is designed for effortless maintenance. Easily set up and manage scheduled test lists and enjoy straightforward upgrades and operation – simplified, efficient, and effective.

- **Experience what your customers experience.**

  Experience proximity to your subscribers like never before. Our platform allows for comprehensive, automated testing of every telecom testing use case, providing you with insights that drive superior subscriber satisfaction.

- Get the most for your money.

  Maximize your testing capabilities with our framework. Transparent pricing means you pay less and have access to more test cases compared to competitors. Get the best value and best coverage for your money with every test executed.

- Let your network be one step ahead.

  Future-proof your telecom testing. Effortlessly integrate new mobile technologies, from 6G to cutting-edge features, by simply adding devices and updating test cases. Minimal effort for maximum outcomes ensures you stay ahead in a rapidly evolving market.

- Convenient analysis visualization.

  Our commitment to automation extends to automated analysis. Customized dashboards enable you to gain real-time insights effortlessly. Our analysis is designed to derive actionable insights at a glance, providing immediate snapshots of your data.

- Tailored automation and verification.

  Constant innovation redefines the landscape of automation and verification. Our customers have the power to determine the depth of testing, ensuring a tailored approach that aligns perfectly with their objectives.

- State-of-the-art AI integration.

  Our AI-based rule generation is designed to facilitate adherence to industry standards such as 3GPP, ETSI, RFCs, and others. This feature ensures that your network and services meet the regulatory and quality guidelines essential for success in the telecommunications industry.

- Flexible integration.

  Enhance your reporting with our flexible integration capabilities. Our solution seamlessly connects with both proprietary reporting environments and popular third-party tools like ALM or Jira. This integration not only streamlines your workflows but also ensures that your reporting process is more reliable and robust. This gives you the confidence to make data-driven decisions with ease.

Are you ready to transform your network's performance?

Go with the best testing solution!

By choosing the QiTASC test automation solution, you are not just opting for a product, but embracing a partnership that will empower your business to lead the way in the telecommunications industry!

Do not miss out on transforming your network's performance and join us on this journey of redefining test automation standards. You not only stay ahead of the curve but also gain the tools to drive innovation and excellence in your telecommunications business.

Discover how we can elevate your business and put you pole position in the worldwide race for number one.

Book your free demo today at info@qitasc.com

Contact us

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