

[SOLUTION SHEET]

Platform: TEMS™ MONITOR MASTER

- Test system upgrades thoroughly

- Find regressions before your customers do

- Fix regressions before they create problems



TEMS™ MONITOR MASTER REGRESSION TESTING SOLUTION

TEMS Monitor Master is a carrier-grade software and hardware solution to test and monitor wireless and fixed line services.

REGRESSION TESTING CHALLENGES

- It is crucial to test the system quickly after any change in order to identify any issues before customers have negative experiences.
- Thoroughly testing for these issues, known as regressions, requires thousands of tests and combinations of tests.
- Once a regression is located, high-quality reports are needed in order to properly correct the problem.

SOLUTION

TEMS Monitor Master provides a comprehensive solution for regression testing which is used by operators and content providers around the world.

- Powerful, flexible testing for any service.
- End-to-end testing from a subscriber's perspective.
- Efficient, objective testing for the most complex scenarios.
- Multi-level customized reporting, from a service overview to individual test cases.

BENEFITS

- Total confidence that upgrades have been implemented correctly.
- Efficient handling of complex systems.
- Rapid identification and resolution of any problems.

ENSURING HIGH QUALITY SERVICES

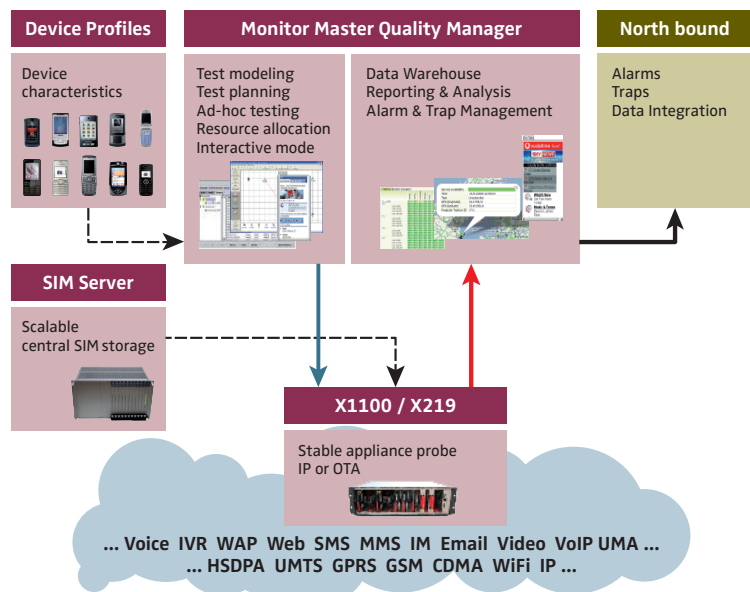
Because next generation services involving Web 2.0 components or VoIP services interact in such complex ways, even minor changes can cause problems. Even very stable services like SMS or Voice can fail given the number of geographic elements involved in delivering them, particularly after a system upgrade.

To ensure that services will continue to be delivered effectively, it is necessary to test all available services from the end-user's point of view. Testing solutions must handle:

- The complete range of available services: Voice, VoIP, SMS, WAP, Web, MMS, Instant Messaging, Mobile TV, and more.
- All major technologies: GPRS, EDGE, UMTS, HSPA, WiFi, LAN, etc.
- All the devices customers are using in the network, from every major vendor.
- New services that arise from evolving technologies such as LTE, IMS, and Web 2.0.

TEMS Monitor Master's Regression Testing solution is based on our award-winning TEMS Monitor Master platform, with a focus on end-to-end validation of complex user transactions. Built using Ascom's established Quality Manager architecture, TEMS Monitor Master provides flexibility, reliability, and performance to satisfy all testing needs. The platform supports distributed agents controlled centrally for a high degree of flexibility. A SIM server provides centralized storage for all SIMs. This allows flexible call campaigns including roaming scenarios.

Tests are scheduled to simulate users accessing different services from different locations, using different SIMs and APNs and thousands of different simulated handsets. When testing is complete, TEMS Monitor Master provides powerful, user-configurable web-based reporting. This includes a full range of presentation options, ranging from a high-level KPI dashboard all the way to Layer 3 radio trace presentation, making TEMS Monitor Master a valuable tool for everyone within an organization.



Typical TEMS Monitor Master Architecture

TEMS MONITOR MASTER OFFERS:

- Industry-leading flexibility. Create tests for new services quickly, without waiting for a product update.
- Detailed trace capabilities. Gather more detail than a handset alone, for faster problem resolution.
- Interactive Mode. Conduct ad-hoc real-time testing from any location, whenever it is needed.
- Powerful reports and data export. Integrate easily with existing procedures and systems, for workflow efficiency.

USES OF TEMS MONITOR MASTER FOR REGRESSION TESTING

Test campaigns. A campaign of tests can be organized to test every aspect of a service. These campaigns can be saved and re-run as needed, and the results compared to the expected levels of service. Reports are then created to confirm that the service is working properly. Examples of test campaigns include:

- Placing calls between all number ranges and all switch locations, to confirm correct voice calling.
- Sending all content types in MMS payloads to a range of target handsets, to confirm correct transcoding.

All tests within the campaign are run automatically and a summary report shows, at a glance, whether all services are functioning properly. With its unique combination of handset data, content detail, IP protocol, and Layer 3 Trace, TEMS Monitor Master is able to provide a comprehensive look at the status of network services.

Multi-modal transactions. TEMS Monitor Master’s standard functionality allows operators to model even complex user transactions such as ring tone and game downloads, with no changes required to the TEMS Monitor Master product.

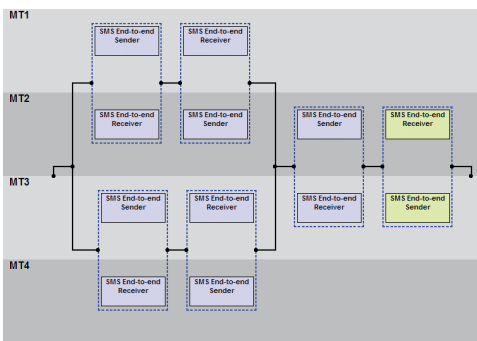
Evolving technologies. TEMS Monitor Master offers the functionality and flexibility to accommodate testing for services beyond basic voice and data. As applications including Web 2.0 and user-generated content reach subscribers, TEMS Monitor Master will help operators keep their networks ready.

USAGE SCENARIOS

Regression tests. Large, distributed TEMS Monitor Master systems can be used to locate regional issues possibly caused by interconnection problems. Repeatable campaigns generate clear overview reports and failures can be identified immediately. Reported errors can be tested instantly using Interactive Mode functionality for quick validation and troubleshooting. This can be used by engineers or even by other applications to trace calls within the network and quickly resolve problems. This can lead to overall cost savings across the network.

Dynamic Content tests. TEMS Monitor Master can be used to confirm the functionality of a dynamic content portal. Even with ever-changing content from various sources, TEMS Monitor Master can provide an early warning if a change has affected service, so the operator can take the necessary steps to resolve the issue.

Network upgrade tests. TEMS Monitor Master can be used to prove that network changes and upgrades have not upset the billing value change, by running a suite of tests to prove that services function and bill correctly after any network change. TEMS Monitor Master’s distributed probes allow operators to focus testing on affected regions, particularly when the network changes are localized; operators can also cover all possible service call types to ensure complete coverage.



Example regression test campaign

Domain	KPI	Device			
		LG US800	Nokia N71	Samung SGH-D600	Sony Ericsson W800
http://deviceatlas.com	Error percentage	0 %	0 %	0 %	0 %
http://dotmobi.mobi	Error percentage	7.14 %	7.14 %	7.14 %	7.14 %
http://dotmobi.typepad.com	Error percentage	0 %	0 %	0 %	0 %
http://edge.quantserve.com	Error percentage	0 %	0 %	0 %	0 %
http://embed.technorati.com	Error percentage	0 %	0 %	0 %	0 %
http://farm1.static.flickr.com	Error percentage	100 %	100 %	100 %	100 %
http://i.yimg.com	Error percentage	0 %	0 %	0 %	0 %
http://mobiForge.com	Error percentage	100 %	100 %	100 %	100 %
http://mobithinking.com	Error percentage	0 %	0 %	0 %	0 %
http://mtd.mobi	Error percentage	0 %	0 %	0 %	0 %
http://pixel.quantserve.com	Error percentage	0 %	0 %	0 %	0 %
http://ready.mobi	Error percentage	30.77 %	20 %	20 %	20 %
http://s7.addthis.com	Error percentage	0 %	0 %	0 %	0 %
http://site.mobi	Error percentage	0 %	0 %	0 %	0 %
http://static.flickr.com	Error percentage	100 %	100 %	100 %	100 %
http://time.mobi	Error percentage	0 %	0 %	0 %	0 %
http://www.deviceatlas.com	Error percentage	100 %	100 %	100 %	100 %
http://www.flickr.com	Error percentage	0 %	0 %	0 %	0 %
http://www.instantmobilizer.com	Error percentage	0 %	0 %	0 %	0 %
http://www.mobiforge.com	Error percentage	0 %	0 %	0 %	0 %
http://www.mobithinking.com	Error percentage	0 %	0 %	0 %	0 %

Example TEMS BoxOffice result report



BENEFITS OF TEMS MONITOR MASTER

- **Repeatability** – Identical tests can be performed again and again. After a change is made, the test can be run again, until the desired results are obtained.
- **Efficiency** – Many more tests can be performed over a given time period without loss of accuracy than is possible with a manual system.
- **Coverage** – Thorough tests can be performed to exercise all scenarios that might be encountered by real users.
- **Detail** – Detailed results are stored for immediate use to help diagnose faults. They can also be used over longer periods to demonstrate compliance with regulatory requirements.
- **Objectivity** – Any test failure can be seen at a glance; the detail available from the test helps resolve any issues much more quickly than using an ad-hoc manual approach.
- **Rapid time to value** – Estimates of revenue loss through leaks can go as high as 10% for new services. Identifying and correcting links is essential for success.

Supported by a team of expert consultants, TEMS Monitor Master provides the carrier-grade tools operators need now and in the future to deliver a visible return on investment.