



Newtest technical presentation

Application monitoring software

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1 INTRODUCTION

This document presents the principle features of the Newtest suite, a solution which measures the quality of experience (QoE) perceived by users.

The product was developed in France starting in 1995. It can monitor any type of digital application (data: thick client, web, voice, video, and mobile).

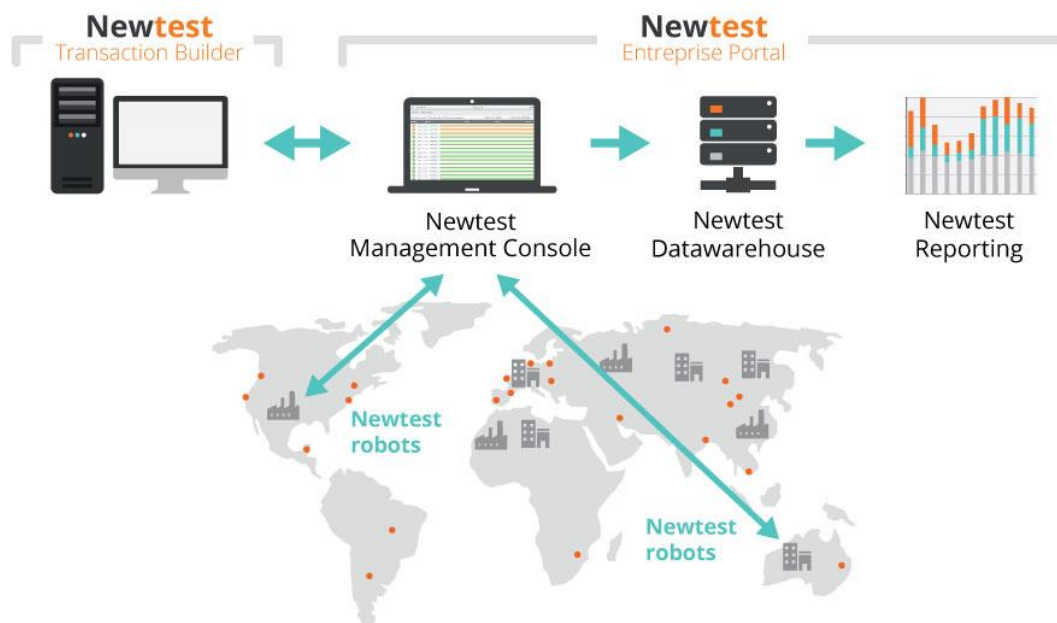
2 NEWTEST: MONITORING THE QOE OF YOUR CRITICAL APPLICATIONS

Newtest is software whose purpose is to measure, monitor, and improve the quality of application services and the level of service delivered to the end user on his or her workstation. It measures the user's quality of experience.

The solution is based on three main elements:

- the monitoring and reporting console, Newtest Enterprise Portal (NEP), which comprises:
 - the monitoring console, Newtest Management Console (NMC)
 - a data warehouse, the Newtest Datawarehouse (DWH)
 - the reporting console, Newtest Reporting Server (NRS)
- a development environment called Newtest Transaction Builder for Robots (NTBR), whose graphical wizards allow for easy development of scenarios
- Newtest robots, which simulate user journeys

The diagram below illustrates the relationship between components:



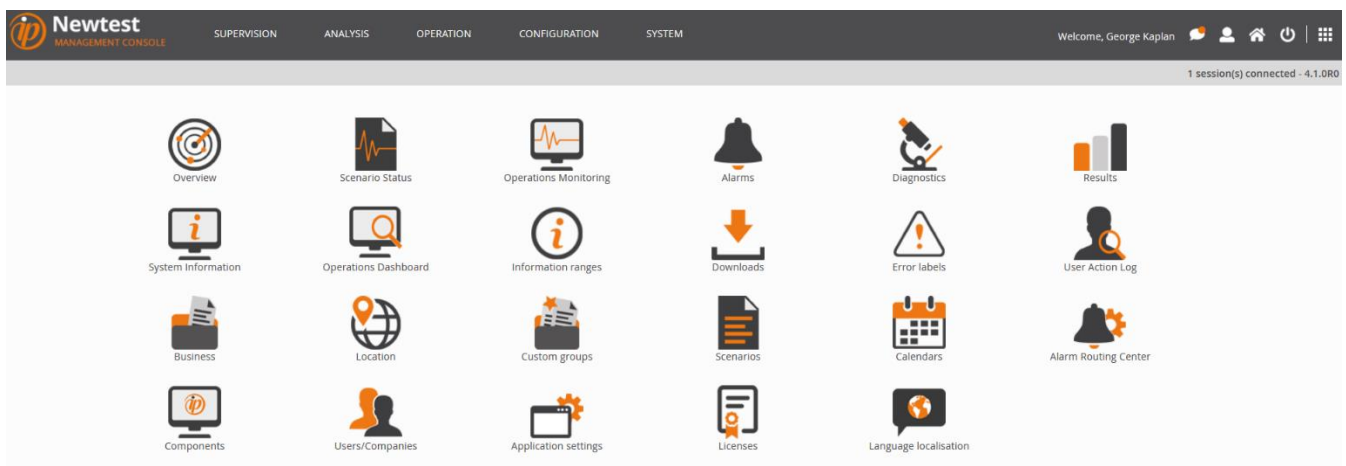
2.1 THE MONITORING AND REPORTING CONSOLE

2.1.1 NEWTEST MANAGEMENT CONSOLE (NMC)

Newtest Management Console (NMC) is the Newtest module that centralizes and displays all information needed to implement a system to monitor the quality of service experienced by end users.

Through its web interface, NMC fulfills three main functions:

- “real-time” supervision of the status of services delivered to end users allows early detection of deteriorations or incidents encountered, and makes it possible to guarantee service level commitments.
- The organization of data allows information gathered by Newtest robots to be grouped and processed to provide each operator with customized syntheses of meaningful data.
- centralized management via the console of the web interface facilitates administration and management of the configurations of all Newtest software deployed in a quality of service monitoring system.



Newtest Management Console’s technical characteristics:

- communication with robots based on encrypted protocols, with a programmable frequency of data propagation
- installation, updates, centralized management of robot configurations and licenses
- possibility of defining Location and Business hierarchies to organize the display of results, for real-time supervision as well as for statistical reports
- administration of aliases for all measurements conducted
- time zone management for correlation of all measurements
- overview for “real-time” supervision and follow-up of alarms, with acknowledgement capabilities; interface for commands to robots and scenarios

The access rights specific to each user type determine the selection of menu options available. The connection profile associated with each user (Administrator, Operator, Manager, User...) makes it possible to further limit viewing rights to specific items.

Newtest also can be integrated with an LDAP(S) directory (Microsoft Active Directory, Open LDAP, ODSE) to facilitate access management.

2.1.2 NEWTEST DATAWAREHOUSE

Newtest Datawarehouse is available for Microsoft SQL Server and Oracle.

The Datawarehouse database can be accessed by market-standard reporting tools (Power BI, Business Objects, Cognos, Hyperion, etc.), depending on the choices made by the enterprise, but data is also accessible directly in Newtest in the Newtest Reporting Server.

2.1.3 NEWTEST REPORTING SERVER

Newtest Reporting is the module for visualizing dashboards and statistical reports built on measurements conducted by scenarios that run on Newtest measurement robots.

The results propagated by Newtest robots to the Newtest Management Console are exported to Newtest Datawarehouse and become available for statistics.

The standard Newtest Reporting package provides reports that meet the main needs in terms of exploitation of Newtest results.

The reports can manipulate three dimensions: Newtest robots, scenarios, and time period.

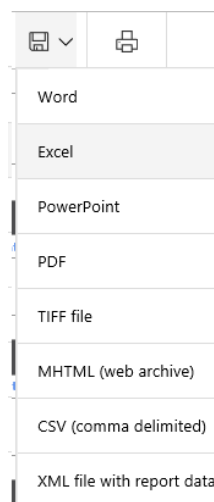
Some forty pre-formatted reports are available in the following categories in the interface of the standard Newtest Reporting package:

- dashboards
- availability and performance
- error category
- response times and measurements
- execution summary

Reports are available for daily, weekly, monthly, and annual periods, or for configurable periods:



Reports can be exported in a variety of formats. The available export formats are shown below:



You can also set subscriptions for automatic e-mailing of reports or storage on a local disk.

2.2 THE DEVELOPMENT TOOL

The Newtest Transaction Builder for robots (NTBR) is the environment for developing and distributing test transactions.

To facilitate production rollout of scenarios, Newtest provides wizards which facilitate “learning” of the transactions to be monitored.

Wizards automatically generate the script for controlling the transaction. Of course it is possible for complex transactions, or for those that resort to multiple decision-making aspects, to enrich the generated script with manual programming.

It is also possible to set a scenario timeout beyond which its execution is considered to have failed.

2.2.1 SCENARIOS

In the context of Newtest robots, a scenario is the element which simulates, in a general way, the actions that a real user would perform. The purpose is to reproduce the progression of a transaction or user journey. A calendar, a planning (schedule), and a frequency set the execution time ranges.

When a scenario runs, it yields one or more of the following results:

- **Completed:** the scenario ran completely without any of the response time measurements that it executes exceeding its associated reference time.
- **Warning:** the scenario ran completely but at least one of response time measurements that it executes exceeded its associated reference time.
- **Failed:** the scenario was unable to complete its execution.

2.2.2 CLIENT ENVIRONMENTS

In the context of Newtest robots, a client environment is the interface between Newtest and the monitored application. Client environments provide functions and graphical wizards for developing scenarios.

The main Newtest client environments:

- **Windows environments**
 - controls Windows application interfaces (thick clients, Citrix) via image/windows recognition, OCR, and keyboard/mouse actions
- **Web and Web 2.0 (Rich Internet Application)**
 - controls Internet Explorer / Chrome / Firefox browser HTML DOM
 - controls browser’s GUI via image/windows recognition, OCR, and keyboard/mouse actions
- **Protocols**
 - handles the following protocol requests: HTTP/HTTPS, PORT, PING, FTP, LDAP, WAP, NNTP, SMTP, IMAP4, POP3, DNS, NTLM
 - handles SOAP and REST web services
- **Emulator**
 - controls the following emulator interfaces: IBM3270, Wincom 3270, Wincom 7107, Wincom VT320, 220, 100,
- **Video**
 - analysis of the quality of a video sequence (video MOS), framerate

- **Audio**
 - analysis of audio, MOS PESQ (speech), call connection metrics, IVR availability and performance (sending of DTMF, speech synthesis and recognition)

2.2.3 MEASUREMENTS

Measurements are objects that are configured in Newtest at the level of scenario scripts or in the definition of transactions. Measurement results are produced while the scenario runs or when the Newtest transaction's characteristic events are detected. Newtest allows several types of measurements to be defined: response time, numeric values and character strings.

For response time measurements, you can associate the measurement with a reference value that corresponds to a threshold whose value should not be exceeded. Reference time is the acceptable response time. The Newtest performance metric represents the degradation of service which corresponds to any overshoot of this reference time.

For applications that are accessed via an IP network, Newtest also offers the option of displaying a breakdown of response times into client time, network time and server time (CNS Client, Network, Server breakdown).

For web measurements, an extraction of browser data (W3C navigation timing measures) makes it possible to break down page loading into:

- server response time
- network loading time
- DOM rendered by the browser

2.3 NEWTEST ROBOTS

In a system which monitors and checks the quality of service experienced by users, Newtest measurement agents (robots) are deployed at a number of locations in response to the expectations of the enterprise's various business units: this is called a network of Newtest robots, and the customer chooses its location.

The Newtest robot is installed on a dedicated machine (physical or virtual) that corresponds to a PC representative of user workstations (in terms of applications, access rights, etc.). It runs on workstation operating systems (Windows 7, Windows 8.1 or Windows 10) or server operation systems (Windows Server 2012 or 2016)

Scenarios are executed sequentially on robots, which have an application queue in which keyboard and mouse actions can be used, and protocol queues if needed, where keyboard and mouse cannot be used.

There are five types of Newtest robot:

- the classic Newtest Probe robot with one application queue
- the Newtest Multi-Probe robot with one application queue and one or more protocol queues
- the Newtest For Testing robot, a preproduction robot for validating scenarios
- the Newtest Voice robot, dedicated to testing IVR servers and voice communications
- the Newtest Test on Request robot for running scenarios at the operator's request

2.4 MAIN FEATURES

2.4.1 AUTONOMY

A correctly configured Newtest robot should not give rise to troubleshooting or maintenance work apart from that related to physical incidents on the computer which houses it. This is why Newtest robots in production perform a series of tasks and automated checks that ensure their autonomy. The various autonomy-ensuring mechanisms include:

- restoration scenarios to handle application errors
- programmable daily reboot for a complete and regular reset of the system
- automatic validation of a network session after reboot, and activation of the execution module
- possibility of triggering a conditional reboot at several levels (session restart, operating system restart, hardware reboot, etc.) upon detection of scenario-related events.

2.4.2 TIME RANGES

The Newtest suite allows a number of different time ranges to be set:

- time ranges that correspond to scenario executions
- time ranges for sending alarms and calculating availability and performance (24/7, office hours calendar, critical calendar)

2.4.3 ASSISTANCE WITH DEFINING SLAS

Newtest helps the user to define thresholds for service level agreements. Newtest Management Console proposes a threshold value based on scenario executions over a given period. This value helps ip-label customers to build their SLAs upon factual elements about user experience for each of the applications monitored. SLAs can then be adjusted to your service commitments with the help of our consultants.

Newtest automatically proposes a threshold value. This value is an aid for building SLAs based on factual elements.

2.4.4 STORAGE OF RESULTS

Data from the scenarios that run on robots are transmitted to Newtest Management Console in accordance with propagation frequencies that can be configured. Data are automatically exported to the data warehouse and consolidated for hourly, daily, and monthly periods.

The data stored in the database (elementary data or aggregated data) are stored in the database for a programmable period. An automatic purge function runs each day and deletes records older than a given date. Detailed data are kept for a default period of 90 days, while data aggregated by day are stored for a default period of 13 months, and indefinitely for data aggregated by month.

2.4.5 DIAGNOSTICS

Problems that arise regularly or occasionally must be analyzed so that they do not occur again or to prepare an action plan to limit the problems caused by any future recurrence.

Specialists need the most complete information possible in order to determine the causes after the fact. The standard Newtest package offers a number of elements to facilitate analysis and diagnostics:

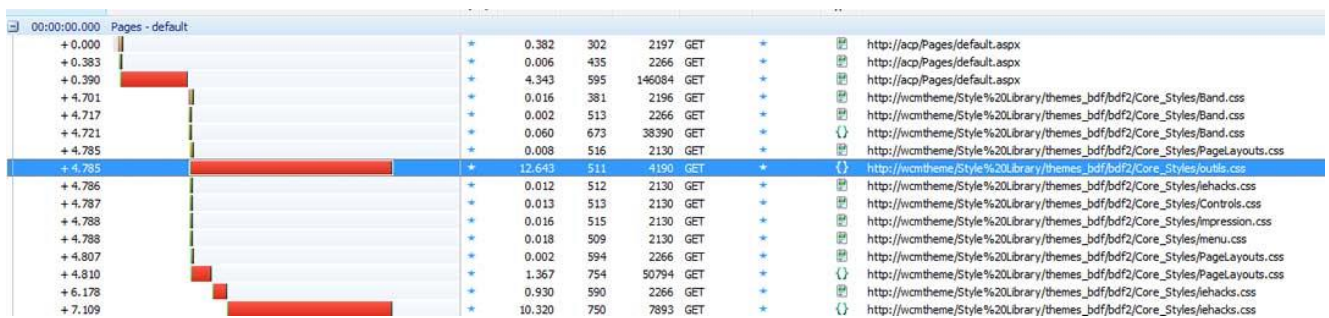
- screen shots

- video of the test
- traceroute
- PC system context
- PCAP network traces
- HTTP traces (.hwl file for viewing with HttpWatch)
- error messages, alarm messages, etc.

These elements can be intended for “real-time” display in the observers provided or for “historical” use in detailed or statistical reports.

Scenarios based on IP can also yield valuable diagnostic items for analyzing the accessibility of fundamental components of the infrastructure (DNS, router, port, etc.). Analysis can then be narrowed down by comparing the results from robots that are situated at different points of the network (in the data center, on a specific LAN, an MPLS network, etc.).

The waterfall showing details of HTTP exchanges enables precise diagnosis of performance elements within an HTML page:



2.4.6 ALARMS

The alerting function is a cornerstone of the Newtest synthetic monitoring solution.

Alerts or alarms are intended to provide operators with near real-time information about an event or series of events indicating abnormal operation. The purpose of the alarm is initiate corrective actions or at least to monitor the impact of the anomaly.

Newtest lets you set alarms that alert recipients when any of a variety of conditions is met:

- a measurement value & violation of a threshold
- state of a step of a transaction
- integrity check: missing data, data error, etc.

Alarms may be generated by the scenarios running on Newtest robots or by the Newtest components themselves (robot down, a problem with batch processing of results, insufficient disk space, etc.).

The Alarm Routing Center component generates alarms with different levels of criticality (information, warning, and critical) in addition to two activation criteria (the number of times an alarm is repeated and the duration of the alarm).

Alarms can be sorted by acknowledgement. The end of the alarm is also recorded.

Alarms are characterized by the transmission of the right type of message (e-mail or SNMP trap) to designated users. Alarms may be sent to a list of recipients, who may differ depending on the calendars defined by the customer.

It is also possible to run a binary or a 'custom' script supplied by the customer when an alarm is triggered.

The optional component **Newtest Alerting Module (NAM)** correlates alarms: this way, an alert can be set to occur only if all of a scenario's executions on different robots fail during the same lapse of time.

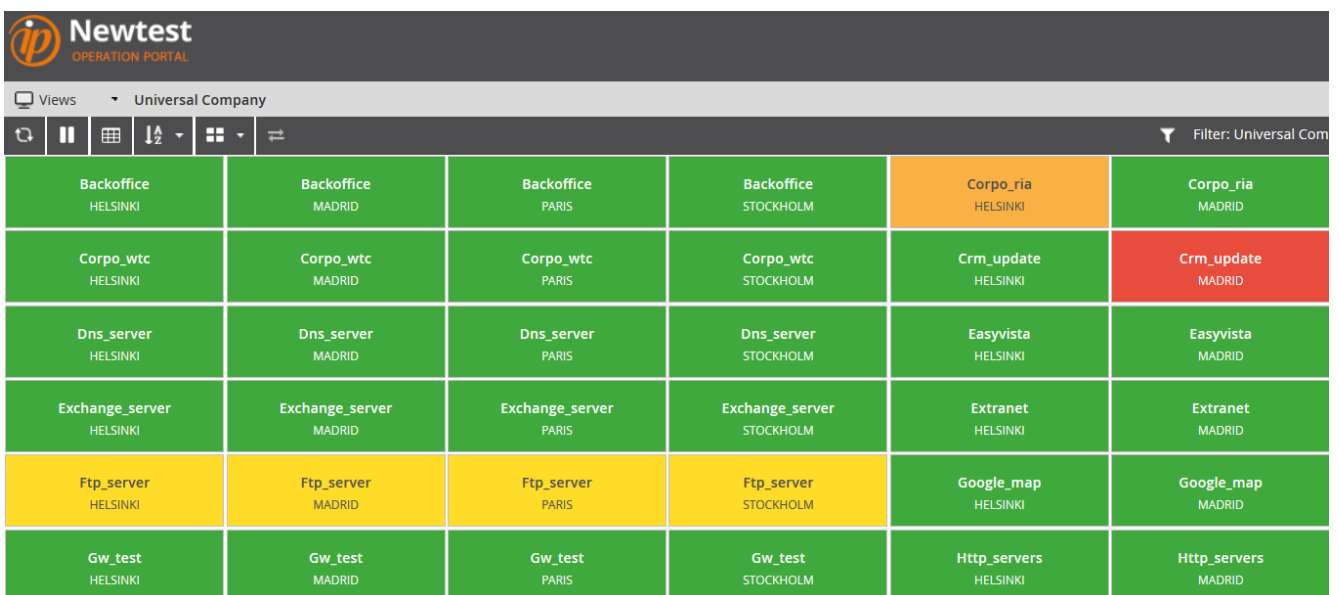
Mapping on an existing framework (IBM Tivoli, HP OpenView, TNG, etc.) can also be set up; this results in centralization at a single point displaying the state of the network, system, and Newtest active agents. Centralization fosters strategies of deduction to identify failed elements or those responsible for deteriorations through the visualization of mapping icons and the alarm correlation engines supplied by the frameworks.

A Nagios / Centreon plug-in is available with Newtest for sending alarms to the Nagios / Centreon console.

2.4.7 NEWTEST WEB SERVICES API

The NMC server offers an optional web services interface (API) that makes it possible for the Newtest server and data to communicate with an external client independently of the implementation language because it is based on a standard. This standardization is built on SOAP and REST protocols which describe the manner of querying the server and the response returned, formatted in accordance with XML.

Newtest Operation Portal is a web "image wall" implementation (operation display) based on the web services interface. This view is designed for control rooms for use on a big screen, for example.



Newtest OPERATION PORTAL					
Views Universal Company					
Filter: Universal Com					
Backoffice HELSINKI	Backoffice MADRID	Backoffice PARIS	Backoffice STOCKHOLM	Corpo_ria HELSINKI	Corpo_ria MADRID
Corpo_wtc HELSINKI	Corpo_wtc MADRID	Corpo_wtc PARIS	Corpo_wtc STOCKHOLM	Crm_update HELSINKI	Crm_update MADRID
Dns_server HELSINKI	Dns_server MADRID	Dns_server PARIS	Dns_server STOCKHOLM	Easyvista HELSINKI	Easyvista MADRID
Exchange_server HELSINKI	Exchange_server MADRID	Exchange_server PARIS	Exchange_server STOCKHOLM	Extranet HELSINKI	Extranet MADRID
Ftp_server HELSINKI	Ftp_server MADRID	Ftp_server PARIS	Ftp_server STOCKHOLM	Google_map HELSINKI	Google_map MADRID
Gw_test HELSINKI	Gw_test MADRID	Gw_test PARIS	Gw_test STOCKHOLM	Http_servers HELSINKI	Http_servers MADRID

2.5 MONITORING AND OPENNESS TO THIRD-PARTY SYSTEMS

The Newtest suite offers many possibilities for integration with third-party systems for global monitoring (Nagios / Centreon, Shinken, SCOM, OpenView, Zabbix), log correlation (Splunk) and reporting (Power BI, Tableau Software, Business Objects).

Moreover, modules for exporting/importing data in specific formats may be proposed in the specifications.