



## QUALITYMATE FOR LOAD TESTING

QualityMate suite of tools enables organizations to industrialize the software development process providing support for different process activities like Requirements Management, Tests Management and Issues Management.

QualityMate solution does not imply you to work in a pre-determined way or apply a specific methodology. QualityMate easily adapts to the way your organization works. Whether your process is highly structured or very agile, QualityMate can be customized to support the way your teams work. You can create an infinite number of entity types and for each one, infinite number of entity attributes. Each entity attribute can be configured to support your own information needs. The workflow process can be completely configured by setting security options and creating constraints, actions and transitions rules for each atomic attribute. By doing this you can be sure your process will be institutionalized.

All the information is stored in the central repository in a hierarchical way and flows naturally between all the different modules, being constantly refreshed without the need of any integration or other process of import/export.

## LOAD TESTING PROCESS

Performance, load, and stress testing allow you to pinpoint system bottlenecks. To conduct performance and load testing you need to engage in a carefully controlled process of business transactions measurement and analysis. Stress testing by other hand, tries to break the system by overwhelming its resources or by taking resources away from it. The main purpose behind this approach is to define the limit of system failure and evaluate how the system reacts to failure. Performance and load testing demands a controlled environment and repeatable measurements, while stress testing joyfully induces chaos and unpredictability.

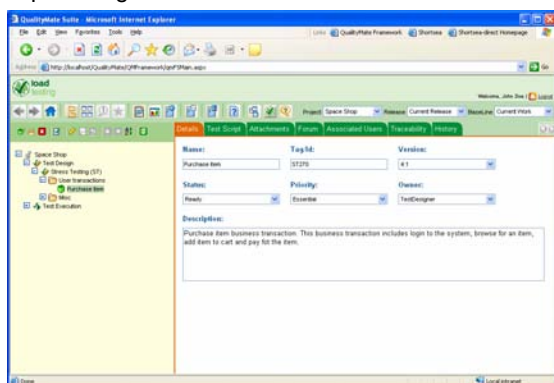
Load testing activities are composed by six different steps. You start to plan and design your load test cases according to your performance requirements. Create virtual user scripts that simulate human user interaction with the system under test. Create load test procedures specifying the load test cases, virtual user number and load agents. Start executing load test procedures, monitor their execution and finally analyze the execution results. Tune the system under test if necessary and repeat the executions until transactions performance time reach acceptable values.





## 1. Load testing plan design

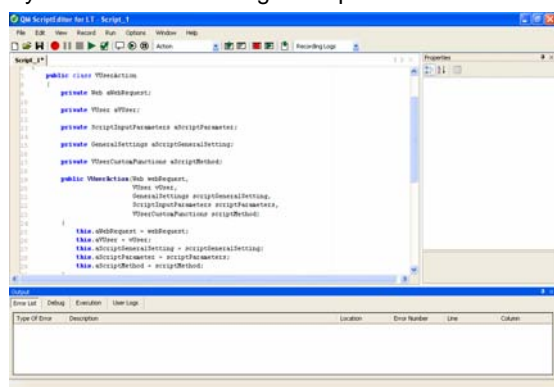
Successfully load testing requires you develop a thorough test plan. A clearly defined test plan will ensure that all load test procedures that you develop will accomplish your load test objectives. Design your load test cases by defining transactions to simulate, performance response times, hits per second, acceptable error levels and expected number of concurrent users. You start to define and manage load test cases providing all the information needed.



QualityMate for Load Testing – Test design

## 2. Creating virtual user scripts

Virtual users emulate human users interacting with the application under test. A virtual user script contains the actions that each user performs during the load test procedure execution. These scripts are created with QualityMate for Load Testing – Script Editor tool.



QualityMate for Load Testing – Script Editor

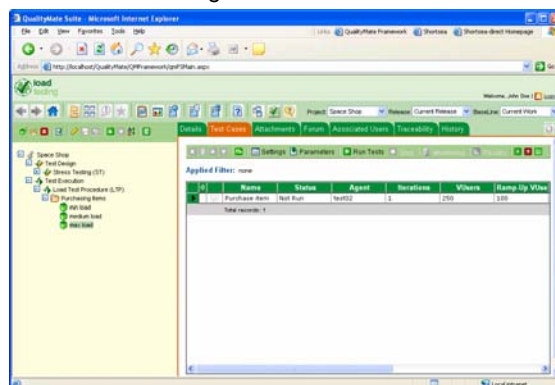
## 3. Creating load test procedures

A load test procedure includes a list of load test cases that will be executed from specified machines (where QualityMate Load Agent's installed) simulating a predefined number of virtual users.

## 4. Executing load test procedures

The load is emulated during the load test procedure execution by instructing multiple virtual users to perform tasks simultaneously. Before executing the

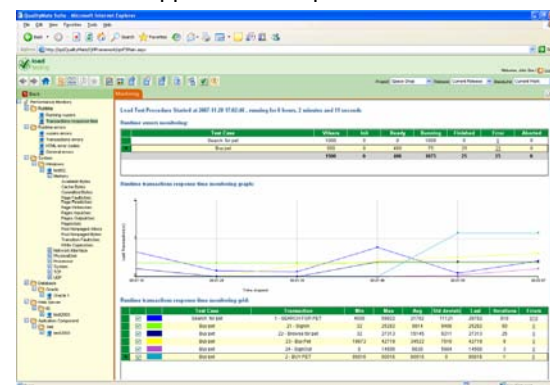
load test procedure you must determine how the virtual users will behave during the simulation



QualityMate for Load Testing – Test execution

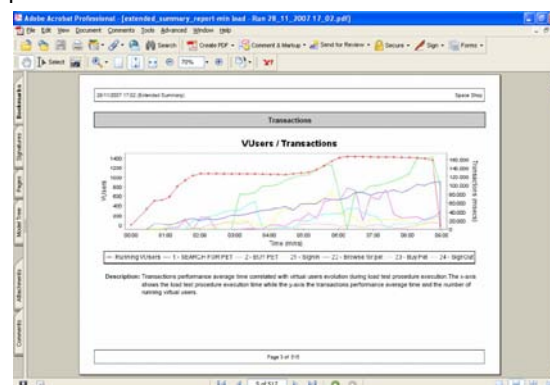
## 5. Monitoring load test procedure execution

While executing a load test procedure you can monitor transactions performance times, errors, and machines performance counters, like operating systems, databases, web servers and application components.



## 6. Analyzing load test procedure results

During load test procedure execution QualityMate for Load Testing stores all data in a central repository. Later on you can use available graphs and reports to analyze your load test procedure execution results.





## QUALITYMATE FOR LOAD TESTING BENEFITS

QualityMate for Load Testing allows you to manage all your testing artefacts including load test cases and load test procedures executions. While the application is under load testing, QualityMate for Load Testing accurately measures, monitors and analyze system performance. QualityMate for Load Testing is the right tool to support and facilitate your load testing process by providing the following benefits:

### Completely adaptable

QualityMate for Load Testing does not force you to work in a pre-determined way or use a specific methodology. QualityMate easily adapts to the way your organization works. Whether your process is highly structured or very agile, QualityMate for Load Testing can be customized to support the way your teams work. The workflow process can be completely configured by setting security options and creating constraints, actions and transitions rules for each atomic attribute. By doing this you can assure your load testing process will be institutionalized.

### Database centric

QualityMate for Load Testing guarantees that the most current data is available to the people who need it, whenever they need it. Each load test can always be associated with any requirement type allowing you to draw conclusions about your project.

### Access information from anywhere

QualityMate for Load Testing is a complete web-based four tier solution. The client layer is supported by a web browser, the presentation layer is developed using .Net technology, the business layer was developed using Java technology and the data layer which can be stored in Microsoft Access or Microsoft SQLServer databases. This technology allows you to access the information from anywhere without installing any extra software on your desktop.

### Easy-to-use interface

Intuitive user interface allows you to guarantee a short learning curve for all stakeholders.

### Automatic notifications

Users can receive automatic notifications every time a defined condition is met.

### Improve collaboration

Forum discussion allows stakeholders to provide important input regarding load testing information.

### Audit trail and change history

Every change is automatically audited. Each change creates a unique history record, highlighting the differences between one version of a load test and another, including the reason for the change.

### Parallel development

Different project releases allow different teams working on the same project but in different releases of the product. Baselines can be created for each project release. By comparing baselines and respective releases you can see where volatility, modifications, additions, and deletions have taken place.

### Supported protocols

- E-Business: this protocol allows you to record any HTTP/S web application emulating the communication between a browser and a web server.
- ERP/CRM: using this protocol you can create virtual user scripts for Siebel Web applications. This protocol performs automating correlation of the Siebel data.



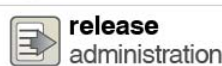
### Online monitoring

QualityMate for Load Testing enables you to view and analyze data gathered during load test procedure execution. A primary factor in a transaction's response time is its resource usage. By monitoring resources during a load test procedure execution, you can determine why a bottleneck occurred on a particular machine. There are four different monitors category available: System (Windows and Unix), Database (MS SQL Server and Oracle), Web Server (IIS), Application component (.NET).

#### Development Tools



#### Administration Tools

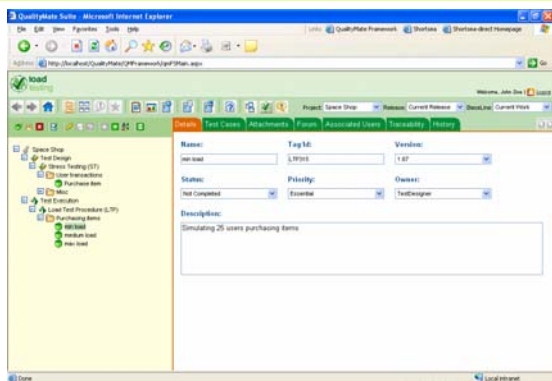




## QUALITYMATE FOR LOAD TESTING COMPONENTS

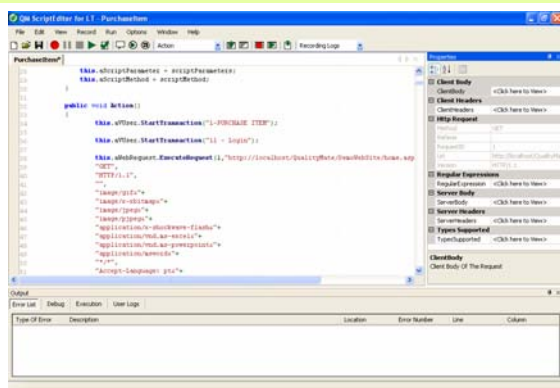
QualityMate for Load Testing includes the following components:

### QualityMate for Load Testing



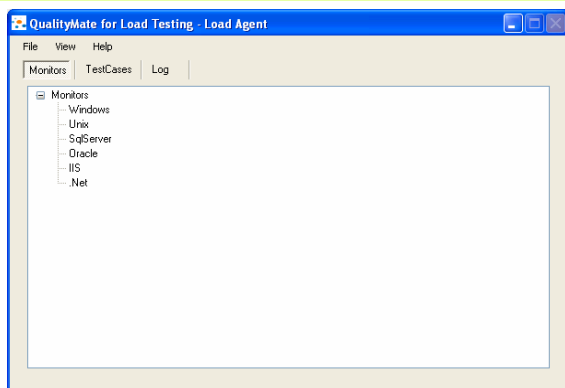
Load Testing controller application module allows you to manage all your testing artefacts including load test cases and load test procedures executions.

### QualityMate for Load Testing – Script Editor



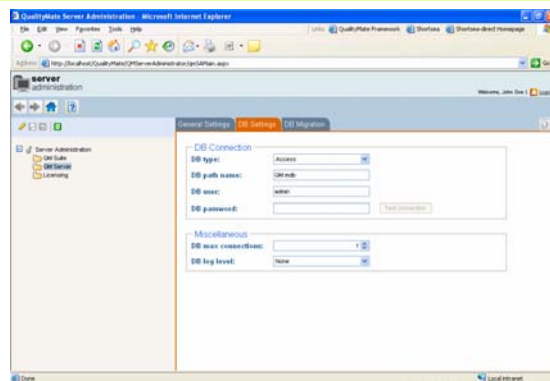
Virtual user test script creation tool uses C#. This means you can use any available C#.NET 2.0 Framework standard objects and methods or even create your own in order to improve script behaviour.

### QualityMate for Load Testing – Load Agent



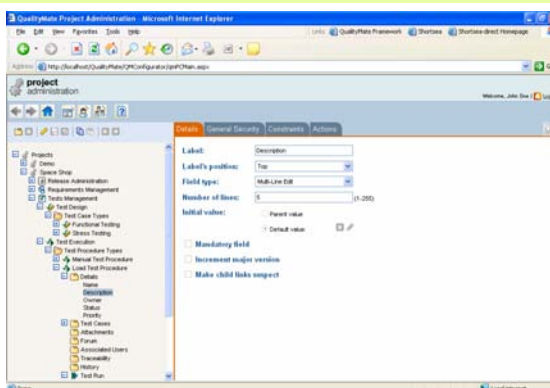
Used for load testing execution. Each QualityMate for Load Testing Agent can simulate thousands of virtual users reducing the amount of hardware needed.

### QualityMate Server administration



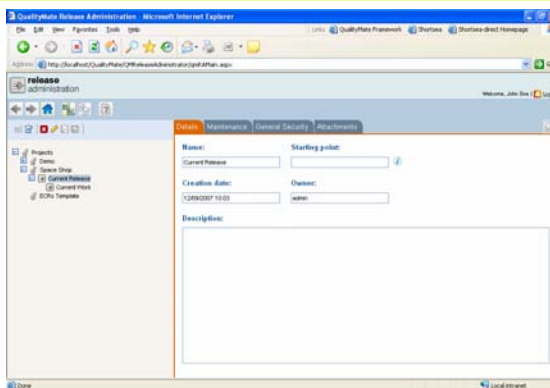
This utility enables QualityMate administrator to set up all QualityMate Server options such as database connectivity, and licence management.

### QualityMate Project administration



This utility enables QualityMate Administrator to manage project specific tasks such as project configuration and user management.

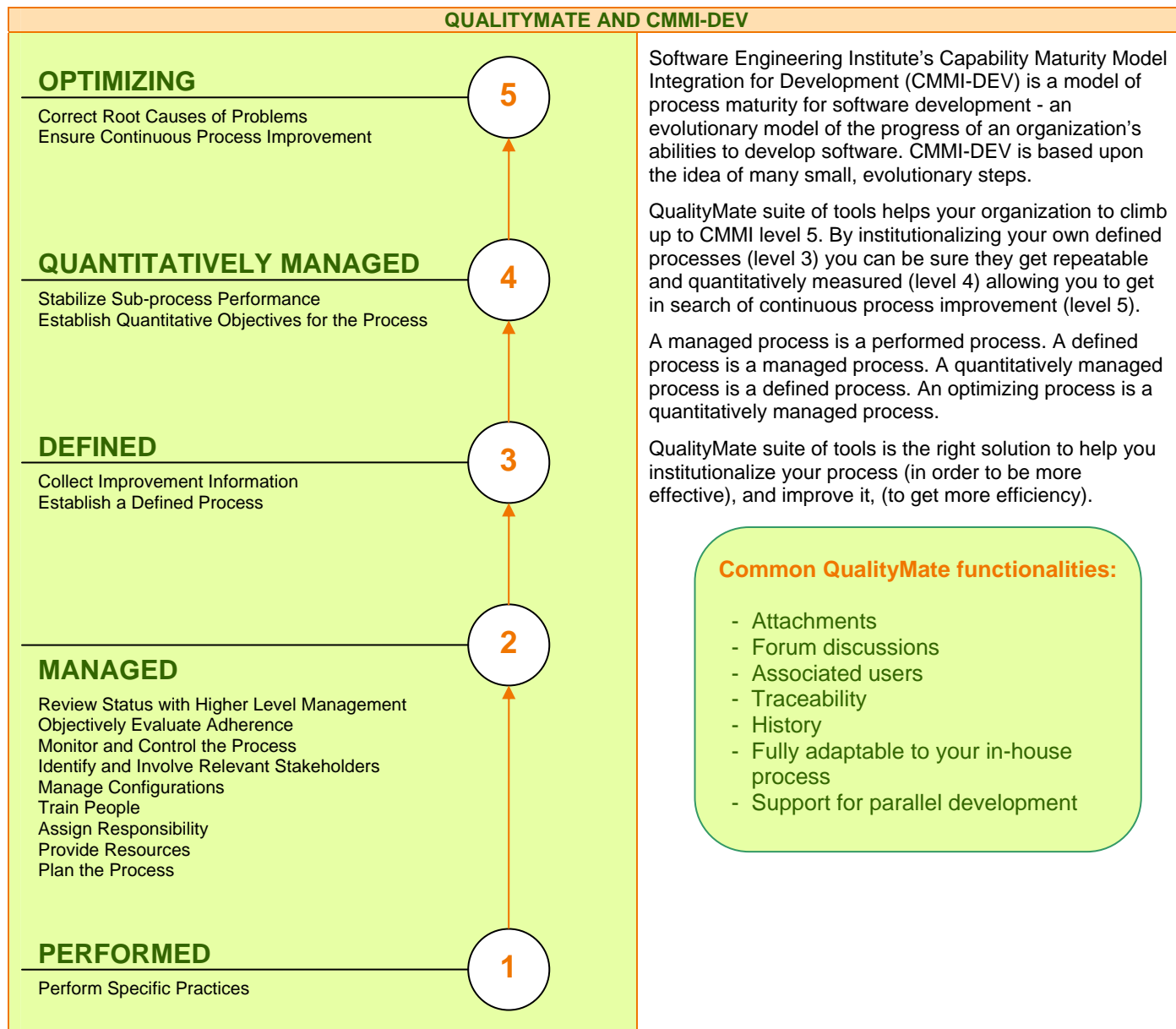
### QualityMate Release administration



This utility enables QualityMate administration to manage project releases and baselines.

## PROCESS IMPROVEMENT

QualityMate for Load Testing is the right tool to improve your load testing process.



### MINIMUM SYSTEM REQUIREMENTS

<b>Client:</b>	Microsoft Internet Explorer 6.0
<b>QM Suite:</b>	Pentium III /1.3 GHz or higher microprocessor A minimum of 512 MB of RAM 55 Mb of free disk space Windows 2000 SP4 or higher or Windows XP Professional SP2 .Net framework 1.1
<b>QM Server:</b>	Pentium III /1.3 GHz or higher microprocessor A minimum of 512 MB of RAM 150 Mb of free disk space Windows 2000 SP4 or higher / Windows XP
<b>QM Load Agent:</b>	.Net framework 2.0

### TECHNOLOGY

<b>QM Client:</b>	Microsoft Internet Explorer 6.0
<b>QM Suite:</b>	Presentation layer is developed using .Net technology
<b>QM Server:</b>	Business layer is developed using Java technology
<b>QM Repository:</b>	Data layer can be supported by MS Access or MS SQL Server databases