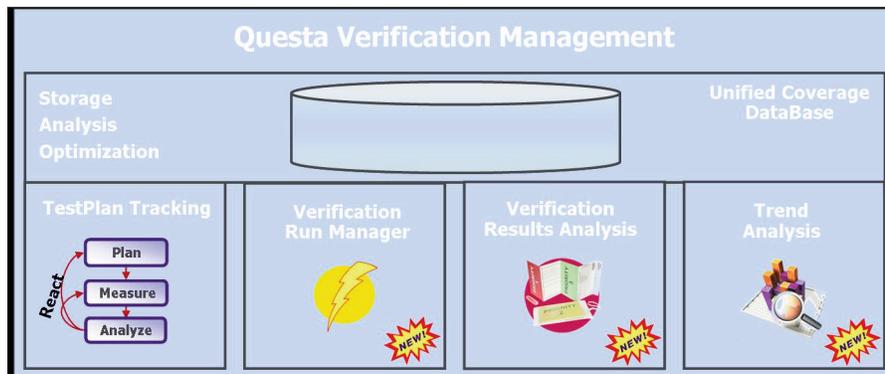


# Questa verification management



*Questa VM - The most effective and modular Verification Management solution.*

## Major product features:

- Visibility to hit market windows on schedule.
- Reduce the volume of data and track project progress.
- Manage the risk to keep resources on track.
- Reduce maintenance and improve automation.
- Jump start the debug process.

## Productivity, visibility and controllability

When verification is not under control, project schedules slip, quality is jeopardized and the risk of re-spins soars. What's required is a common platform and environment that provides all parties – system architects, software engineers, designers and verification specialists – with real-time visibility into the project. And not just to the verification plan, but also to the specifications and the design, both of which change over time. There are three dimensions to any IC design project: the process, the tools and the data. Questa® offers a comprehensive approach to verification management that handles them all.

## Database management

Very roughly, the amount of verification data grows in proportion to the square of the gate count. So given the rise in design complexity, it's no surprise that data management is increasingly the foundation of verification management activities. Questa's verification management capabilities are built upon the Unified Coverage Database (UCDB).

UCDB can capture any source of coverage data generated by verification tools and processes; Questa and ModelSim use this format natively to store code coverage, functionality coverage and assertion data in all supported languages. UCDB also enables the capability to capture information about the broader verification context and process, including which verification tools were used and even which parameters constrained these tools. The result is a rich verification history, one that tracks user information about individual test runs and also shows how tests contribute to coverage objects.

A small collection of utilities help handle data associated with a range of verification activities: merging, ranking, analyzing and

reporting. And because of the open API, users not only have complete access to the data but also the ability to customize any aspect of the analysis and storage of such data.

## Process management

Verification is driven by requirements concerning both the functionality of the final product and the intended methods of testing this functionality. By providing tools to import verification or test plans and then guide the overall process, Questa verification management helps deal with this complexity and shepherd a project toward electronic closure. It also provides the ability to store snapshots of data across the lifetime of a project, which helps to concentrate efforts where they are most needed.

## Test plan tracking

Projects are tracked in spreadsheets or documents created by a range of applications, from Microsoft Excel and Word to OpenOffice Calc and Write. So it's critical that a verification management tool be open to a range of file formats, a basic feature of Questa, which is built on the premise that a user should be able to use any capture tool to record and manage the plan. This document becomes the guide for the verification process and within Questa's user interface the plan's data can be sorted, filtered and subjected to complex queries such as which tests are most effective at testing this particular feature or which set of tests needs to be run to get the best coverage for a modified instance of the design. The tool allows the plan to be annotated with nearly any category of metadata, which can then be sorted (by engineer, project group, verification method, milestone, and so on) and tracked. This sorted data can then be shared in text or HTML reports, making it easier to allocate scarce resources and more accurately hit and manage deadlines.

## Trend analysis

Understanding the progress of a dynamic verification process requires an ability to view coverage data. Accordingly, a verification management tool needs to provide the means to manage, view and analyze this data, whether it's generated from a single test or the combination of a complete regression run. Just producing and managing individual snapshots of coverage data can be difficult due to the huge amounts of data involved. And these snapshots generally fail to give a good idea of progress being made over time, which depends on the ability to view and analyze data from multiple regression runs. UCDB affords this ability, reducing to a single database the regression data from multiple snapshots and then querying this database for trends. The merging capabilities are significant as these reduce the data stored by two orders of magnitude while at the same time giving full visibility on progress of all relevant aspects of the verification or test plan. The types of data recorded include that related to coverage of design units, instances of design units, functional coverage and the overall verification plan.

## Tool management

Verification management means balancing various tools and techniques to get to closure, often with an infrastructure built on home-grown scripting and lots of manual maintenance. And as verification complexity ascends, so too does the need for a more flexible automated solutions.

## Verification run management

Questa's verification run manager is one such solution, bringing consistency to a project through heavy doses of automation. Among the benefits of automation: improvements in time to coverage and time to next bug, and also increased ability of dispersed project teams to accurately estimate the time to completion.

The run management system records the definition of the tasks needed for verification, the dependency between these tasks, and parameterization of the tasks, all of which helps to automate decisions. Other features that help gauge the effectiveness of the verification environment include easy monitoring of regression completeness, simulation times and test failures.

Questa can control and monitor the launching of regressions locally, on a network or further integrated with a load sharing

system such as LSF or Sungrid. Many regressions are run overnight and the verification team does not want to waste time re-running tests in the morning before being able to start debugging. This is why any tool's run system needs to ensure that all jobs are complete and that jobs that fail as part of the regression are re-run with full visibility, one of the many features of Questa's verification run manager. The tool also helps handle the tedious post-processing chores of merging coverage, analyzing tests, managing the verification plan and optimizing and ranking the regression tests. One example: as simulations are complete and coverage results are available, they are added to a merge queue where merge tasks are automatically generated and deployed to combine the results from multiple jobs. This increases efficiency by spreading the merging process, especially when combining multiple coverage sets, and also makes coverage data available sooner than the alternative of waiting for all tests are completed before beginning analysis.

## Verification results analysis

Questa's verification results analysis speeds the ability to address failures identified during a regression, which helps a verification project to stay on schedule. The technology brings together the results of multiple verification runs, assisting in the grouping, sorting, triaging and filtering of messages over the complete set of regression tests. The results analysis can be triggered automatically and used by the run manager, allowing the results of a given test to control if and what should be saved in a triage database to allow further analysis.

Questa's results analysis and triage capabilities can be used as standalone technology, though of course there are benefits to integrating with other Questa capabilities. One such benefit: speeding along the debugging process by providing the tool's verification run manager with incremental data that can be analyzed to fix problems during regression testing instead of at the end of the regression cycle.

Questa Verification Management is the most effective and modular solution available in the industry today. It is able to management all three dimensions of the verification process, allowing both incremental improvements to any verification environment or multiple benefits from the management of the complete flow.

Visit our web site at [www.mentor.com/fv](http://www.mentor.com/fv) for the latest product news.

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### Corporate Headquarters

Mentor Graphics Corporation  
8005 S.W. Boeckman Road  
Wilsonville, Oregon 97070 USA  
Phone: 503-685-7000

North American Support Center  
Phone: 800-547-4303

### Silicon Valley

Mentor Graphics Corporation  
1001 Ridder Park Drive  
San Jose, California 95131 USA  
Phone: 408-436-1500

Sales and Product Information  
Phone: 800-547-3000

### Europe

Mentor Graphics  
Deutschland GmbH  
Arnulfstrasse 201  
80634 Munich  
Germany  
Phone: +49.89.57096.0

### Pacific Rim

Mentor Graphics Taiwan  
Room 1001, 10F  
International Trade Building  
No. 333, Section 1, Keelung Road  
Taipei, Taiwan, ROC  
Phone: 886-2-27576020

### Japan

Mentor Graphics Japan Co., Ltd.  
Gotenyama Garden  
7-35, Kila-Shinagawa 4-chome  
Shinagawa-Ku, Tokyo 140-0001  
Japan  
Phone: 81-3-5488-3033

