

vManager Metric-Driven Signoff Platform

A powerful, scalable, and automated verification planning and management solution supporting multi-user, multi-engine, multi-projects, and multi-sites simultaneously

The Cadence® vManager™ Metric-Driven Signoff Platform, enabled by client-server technology, is the only second-generation verification planning and management solution for pre-silicon functional verification. This enterprise-class solution lets you connect people and processes in small to ultra-large verification projects. You can use the platform to simply execute regression tests, or use it for large-scale, database driven, metric-driven verification (MDV) programs. With the vManager platform, you benefit from optimal resource utilization, higher-quality silicon, and a more predictable path to verification closure.

Overview

In 2004, the vManager product pioneered verification planning and management with the industry's first commercial solution to automate the end-to-end management of complex verification projects—from goal setting to closure. Now, the vManager platform provides optimal scalability by deploying in a client-server architecture with a commercial SQL database. The vManager Metric-Driven Signoff Platform propels verification from a simulation-centric individual tool activity to team-based verification productivity (Figure 1).

The vManager platform automates the verification process at the block, chip, system, and project level. The platform enables you to automate the management of all activities, from specification to verification signoff. It automates the authoring of verification plans and the deployment of verification jobs, including functional and structural coverage analysis, triage failures, and control of each of the steps toward closure. The vManager platform automates the tasks that would otherwise require intensive human interaction or custom-software

development, or that are simply impossible to achieve manually.

For test-driven verification teams (Figure 2), the vManager platform lets you automate the execution of parallel Verilog or VHDL-oriented tests. It can also provide detailed code and assertion-based coverage results to design teams. The vManager platform includes powerful regression dispatch, management, and failure analysis features. The platform lets you easily filter and analyze the data, annotate

and correlate results against test scenarios, and display user-defined views of progress toward closure. Incrementally, you can enhance verification environments with the Cadence JasperGold® Formal Property Verification (FPV) App for closing specific-purpose tasks faster, or as an alternative to simulation-based verification.

For advanced verification teams, the vManager platform enables your verification engineers to deploy a

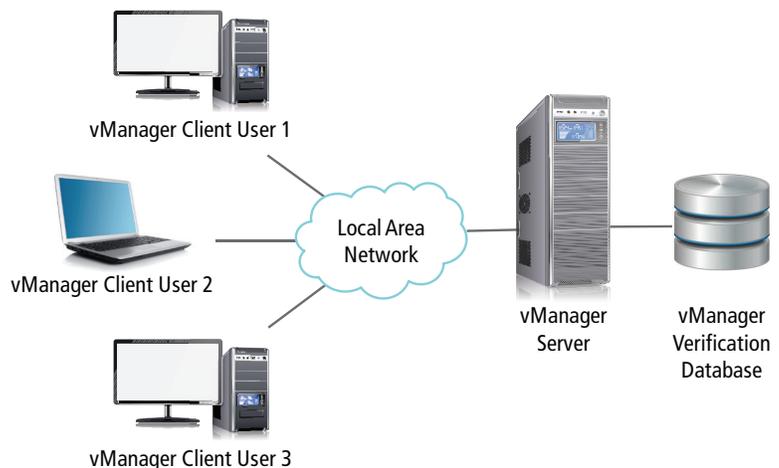


Figure 1: vManager client and server components

coverage-based, metric-driven process based on the industry-standard Universal Verification Methodology (UVM) (Figure 2). And where UVM stops, top-down software-driven testing takes over. The Cadence Perspec™ System Verifier, a system-on-chip (SoC) solution, automates constrained random test generation through the processor onboard the design, to find bugs faster. In both cases, the vManager platform converts random data results into organized views, reproducible by seed, to help you see and manage what has been tested and to what extent.

Taking advantage of the closed-loop approach provided by MDV, your verification teams can start from a feature-based verification plan (vPlan). You can include specifications, project data, user-defined attributes, or top-level external requirements in the plan. And, you can synchronize external data—such as bug data—with regressions or plans through an ALM-style API. With this approach, your project teams can eliminate the subjectivity associated with complexity or disparate systems. You can use the vManager solution to achieve a single data-driven view of the verification process.

The vManager platform supports scalability from the smallest standalone project to large-scale SoC programs. In its largest configuration, the vManager platform supports millions of runs, gigabytes of coverage data, hundreds of engineers, and tens of simultaneously-executed and linked verification plans. By automating this vast amount of verification data and complexity, the vManager platform makes it easy for you to stay focused on the big picture.

Benefits

- Provides operational efficiency with independence from execution engines
- Drives the complete verification process from planning to closure
- Shortens overall failure turnaround time to optimize bug closure productivity
- Optimizes and ranks test effectiveness to minimize farm utilization

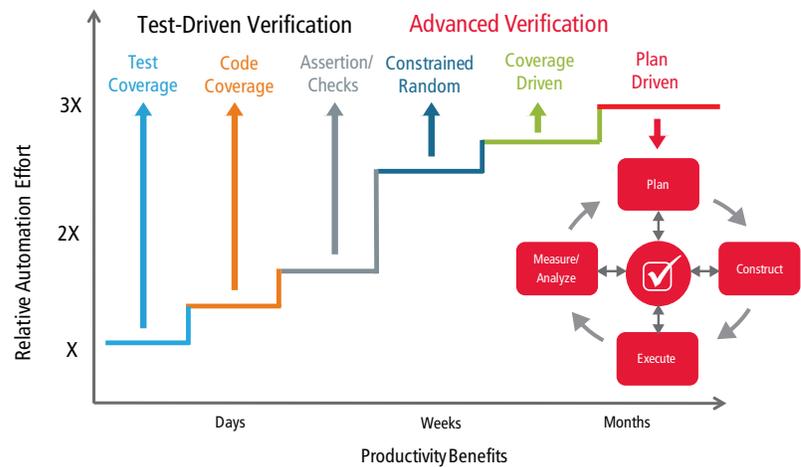


Figure 2: MDV investment alternatives for RTL verification

- Directs and re-directs resources to achieve faster coverage
- Defines project milestones, then automatically measures and tracks progress
- Reduces overall maintenance with an integrated regression runner
- Improves engineer productivity using a highly intuitive and consistent user interface

Features

Team-based verification productivity

For the first time, verification teams can collaborate on verification programs simultaneously. The vManager platform keeps track of job submissions, manages re-assignments, and provides a single, holistic view of everyone's submitted jobs during the verification program. This single-portal concept allows for real-time collaboration between members of verification teams, design teams, and management, and enables rapid decision-making. Results are immediately shared among all project team members.

Multi-Engine MDV

Multi-engine MDV lets you apply MDV concepts across the Cadence System Development Suite engines and technologies, so that you can merge and roll up meaningful results to a top level. Multi-engine MDV lets you apply MDV to areas such as mixed signal, hardware acceleration, emulation, and formal applications

to improve verification effectiveness and productivity. You can also improve verification productivity by performing deep bug hunting in the JasperGold FPV App, use the high-speed, multi-core Cadence Xcelium™ Parallel Simulator, or leverage Cadence Palladium® hardware acceleration, and combine the data across all three. The vManager platform provides data consistency and congruency down to the lowest leaf or bin level. Multi-engine MDV can help you improve productivity on all SoC projects, which, by their very nature, require that many teams and technologies interoperate seamlessly.

Industry-best integrated coverage

The vManager Analysis feature provides the industry's most comprehensive code and functional coverage analysis. When you select a regression, the tool automatically rolls up and merges coverage, and then recalculates again when you select a different regression. You can manually or automatically apply coverage waivers (refinements) to a design. When you change the design, the vManager platform keeps track of which refinements you associated to which parts of your code, thus enabling refinement resilience. You can analyze coverage from any Cadence engine that is able to read or write into the Cadence unified coverage database (UNICOV). This includes the Xcelium simulator, select JasperGold Apps, Palladium XP, XP II, and Z1 Verification Computing Platforms, Cadence Specman® Elite, Perspec System

Verifier, and Cadence Interconnect Workbench. Third-party coverage interoperability is provided by the Specman Elite solution or through the interoperable subset of coverage defined by the Unified Coverage Interoperability Standard (UCIS version 1.0).

Most powerful user interface

The vManager platform's multi-window graphical user interface (GUI) takes the guesswork out of which views are needed by organizing default views by activities. Speed up searching, sorting, and filtering with the GUI's detachable panes and SQL-based tables. Improve your productivity with customized views and fields, an intuitive forward-and-backward one-click history, hyperlinked source-code windows, and metric-analysis windows. You can easily generate custom HTML reports in the visually intuitive, WYSIWYG-style reporting scheme. And, you'll find it easy to move between the vManager platform and the Cadence® Integrated Metrics Center (IMC) because both use the same modern user interface.

Unified verification planning

For optimal productivity, you need feature-based verification plan creation and a unified interface that spans verification engines. The vManager Planning feature helps your teams capture the verification intent statically from a specification, or dynamically through brainstorming sessions, merging session iterations as your teams learn more. You can easily perform a round-trip synchronization of your plan with spreadsheets or a legacy verification plan. The vManager Planning feature boosts your productivity with its support for:

- The specialized requirements of RTL verification
- Plan reuse
- Hierarchical plans
- Change management
- Specification coverage
- One-click custom perspectives
- Synchronized coverage-grade roll-up to or from any level of DUT hierarchy

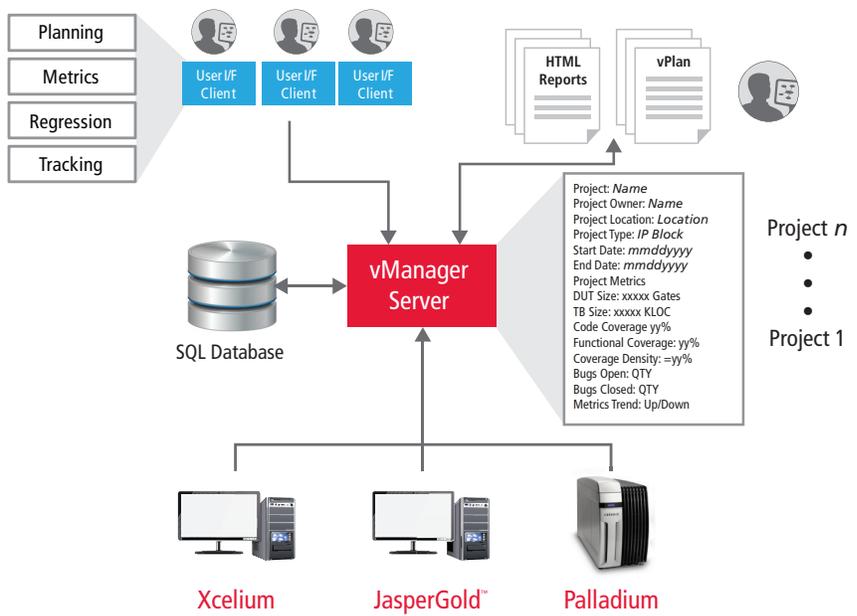


Figure 3: vManager highlights

Cadence also provides the industry's largest portfolio of verification IP, which includes pre-designed vPlans to jumpstart your verification program and accelerate your time to first test from weeks to hours.

Failure analysis and triage

The vManager platform simplifies your overall debugging effort and shortens failure debug time. You can separate design failures from job failures, and then sort and group these failures for easy selection and action. Using the platform, you can identify the least costly way to reproduce that failure with the optimal debugging case. You can take a deep dive into root cause analysis with key triage features, including first failure notification, failure signatures, and in-context source data windows. You can configure the vManager platform to automatically verify test failures, re-run those failures with greater verbosity, and then collect and electronically distribute debug data to each engineer after the nightly regression, saving hours of triage time.

Tracking, managing multiple projects, and multi-site management

Whether you're managing several projects simultaneously, rolling-up summaries, or deciding which project or program needs

additional help, you need one central portal for keeping track of status and verification progress. With the vManager Tracking feature, you can independently define and execute projects and sub-projects, and then combine them to see all of the global project team results for a single program. You can apply security settings on a per project basis to block IP leakage. Combine data from remote sites into a local site, and manage it all through a simple administrative setup dialog box. Working remotely, you can use the vManager user interface client to login to any vManager server, and instantly become an active member of that verification team, regardless of location.

MDV Components

IMC

- Provides single-run coverage analysis environment for Cadence front-end engines
- Automates coverage viewing, merging, and analysis
- Supports code, toggle, expression, FSM, and functional coverage in any language, as well as PSL or SVA assertions
- For more information, see the [Integrated Metrics Center technical brief](#)
- Establishes user-defined security and authorization rules for the clients and web
- Includes commercial, robust, fully embedded SQL database
- Provides web-based interfaces for triage, management dashboards, and web-based regression interface
- Delivers vManager API connectivity for ALM or batch automation
- Provides embedded distributed resource manager (DRM) support for LSF, Oracle Grid Engine, Univa Grid Engine, OpenLava, and open user-defined DRMs
- Compatible with the previous generation of the Cadence Incisive® Enterprise Simulator

vManager User Interface Client

- Presents unified user interface for verification engineers, designers, and managers
- Organizes activities for the key functions of planning, analysis, regression, and tracking
- Enables execution of all functions from either batch or GUI mode
- Operates over LAN or WAN for remote engineers
- Embeds all aspects of the IMC into the vManager Analysis feature
- Provides comprehensive verification plan authoring to build executable vPlans
- Captures and tracks project metrics, which can populate web dashboards
- Supports regular and complex expressions in SQL-style data search, sort, and filtering operations
- Presents drillable WYSIWYG-style HTML reports

vManager Server

- Provides multi-user and multi-project backend services, structure, and support
- Manages all analysis calculations and user views

Cadence Services and Support

- Cadence application engineers can answer your technical questions by telephone, email, or Internet—they can also provide technical assistance and custom training
- Cadence-certified instructors teach more than 70 courses and bring their real-world experience into the classroom
- More than 25 Internet Learning Series (ILS) online courses allow you the flexibility of training at your own computer over the Internet
- Cadence Online Support gives you 24x7 online access to a knowledgebase of the latest solutions, technical documentation, software downloads, and more
- For more information, please visit www.cadence.com/support for support and www.cadence.com/training for training



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