

## INTEROPERABILITY COMES TO EDA TOOLS

*“Our engineers need to move between Tanner and Mentor Graphics® EDA tool sets several times in the design flow. How can we operate more efficiently yet keep our tool costs down?”*

It's common for IC designers to deal with heterogeneous flow, moving among tools for compelling business reasons:

- **Cost** – Even though most of their designs require only a fraction of the functionality and expense of a Mentor Graphics tool suite, some companies purchase full Mentor Graphics tool seats for occasional, large, or complex designs.
- **Foundry** – For full-chip sign-off, many foundries consider Calibre® the gold standard for physical verification, so designers obtain Calibre licenses and use Tanner Tools for layout and schematic entry.
- **Learning curve** – Designers in small companies need easy-to-use, affordable, PC-based tools they can learn quickly for most of their work, while still needing Mentor Graphics tools for complex applications and foundry standards.

However, the back-and-forth movement of files in a heterogeneous flow is inefficient and potentially risky. As designers work around binary incompatibilities and move text files from one system to another, this flow broadens the potential for error and introduces several problems:

- **Loss of data** – A false move during the export/import step could result in the use of the wrong file at best, or at worst, in loss or corruption of data. Interoperability among EDA tools removes the manual step and minimizes this risk.
- **Loss of time** – A layout engineer may run DRC between 200 and 1,000 times during a project, and a heterogeneous flow can increase DRC- or LVS-time by up to two minutes per run. Interoperability can greatly shorten a design project.
- **Loss of efficiency** – Because heterogeneous flow can be cumbersome and time-consuming, layout engineers may hold off on running DRC/LVS, thereby leaving problems undetected until late in the project, when it generally takes longer to address them. Interoperability improves designers' productivity and encourages ongoing DRC throughout the project instead of leaving it until the end.

*“We're concerned about the integrity of the data. How do we connect these tool sets to maintain a transparent, smooth flow?”*

**To help replace a heterogeneous flow with interoperability among EDA tools, Tanner introduces its External Verification Interface (EVI) plug-in for Tanner Tools that work with Calibre® RVE and Calibre Interactive.**

Users of Tanner's S-Edit (Schematic Capture) and L-Edit (Physical Layout) can now enjoy integration with verification tools from Mentor Graphics; users of Mentor Graphics tools can now take advantage of Tanner's lower-cost, alternative EDA tools for layout and schematic. Both sets of users can design affordably and verify quickly to industry standards without the cumbersome, error-prone export/import step.

- Engineers can continue to design with Tanner's industry-standard, PC-based layout tools while avoiding the risk of errors from manually moving files back and forth between toolsets.

- Remote users enjoy the portability of Tanner Tools connected to verification tools and results files on servers running Calibre RVE and Calibre Interactive.
- Tanner's L-Edit and S-Edit display results (DRC, LVS and parasitics) from Calibre natively.
- IC designers who have invested in Mentor now get more value from tightly integrated Tanner Tools.

EVI is a plug-in that implements 100% of the Calibre Results Viewing Environment (RVE) interface, so Tanner users can now perform layout-to-schematic cross-probing without leaving L-Edit and S-Edit, greatly simplifying LVS verification.

### Designed for Users of Calibre

Calibre users can now view DRC, LVS and parasitic extraction results, including highlighted nets and/or devices, in L-Edit and S-Edit through Calibre RVE and the EVI plug-in. For more efficient LVS, EVI also takes advantage of Calibre RVE's ability to display hierarchical SPICE netlists and to inspect parasitic capacitances, sorted by node or layer.

Designers who have invested in Calibre RVE and Calibre Interactive can now pair that investment to many more layout and schematic capture seats with Tanner's affordable, easy-to-use tools. Viewing Calibre results and modifying designs directly in L-Edit and S-Edit is a powerful productivity boost.

EVI runs on the PC client, alongside the Tanner Tools, and connects to a running Calibre RVE license on a Unix/Linux server. This allows engineers the flexibility to design and verify wherever and whenever they want.

### Simple Installation and Configuration

Tanner EVI is automatically installed on the PC along with L-Edit or S-Edit. A configuration dialog allows you to set the port number for communication with Calibre RVE and Calibre Interactive, the intermediate file locations for storing the results when passing them from the PC to the server running Calibre, and the location of the L-Edit/S-Edit design database. EVI resides entirely on the client machine running Tanner Tools.

### Running DRC and LVS

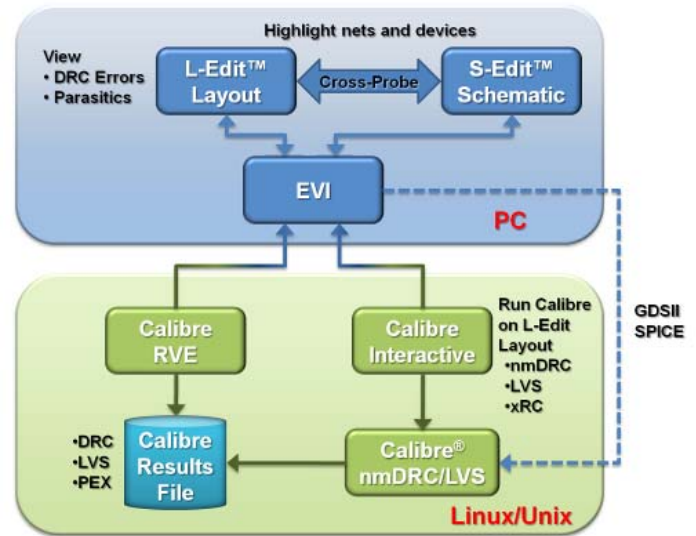
The designer can run DRC or LVS directly on a cell in L-Edit/S-Edit by specifying the design database and the primary cell in Calibre Interactive. Communicating through the EVI plug-in, Calibre Interactive then exports the files needed from L-Edit/S-Edit and runs Calibre on those files.

- For DRC, EVI makes a call to L-Edit to export the layout in GDSII format, then sends it to Calibre nmDRC.
- For LVS, EVI makes a call to L-Edit for the exported layout and to S-Edit to export the schematic in SPICE format, then sends them to Calibre LVS.

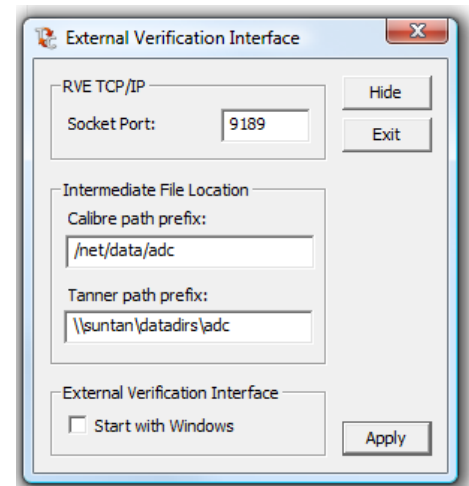
Calibre runs and then creates the Calibre results file, while the user remains in L-Edit. When the results are ready, they are loaded into Calibre RVE for review.

### Viewing Errors

To view DRC errors, the designer clicks on the error in Calibre RVE, which communicates through EVI to highlight the error in L-Edit. The errors display in



Tool Flow for EVI and Calibre RVE



EVI Setup Dialog

## FEATURED PRODUCT

External Verification Interface (EVI) for  
Tanner Tools

## PRODUCT BENEFITS

- Efficiently integrate your sign-off verification tools with Tanner Tools™
- Protect your investment in EDA Tools with seamless integration
- Maximize productivity with an efficient verification platform.

## PRODUCT FEATURES

- View Calibre LVS results directly in L-Edit™ and S-Edit™
- Highlight nets and/or devices in L-Edit and S-Edit
- Perform layout-to-schematic cross-probing
- View Calibre parasitic extraction results directly in L-Edit and quickly inspect parasitic capacitances, sorted by node or layer
- View Calibre DRC errors directly in L-Edit
- Run Calibre on an L-Edit or S-Edit design
- Works across the network, allowing Linux®- based Calibre to work with Windows®-based Tanner Tools.



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sequence, and the designer resolves each one in turn in L-Edit, optionally re-running DRC.

## Cross-probing

The advantages of interoperability are even greater when cross-probing. EVI supports both tools by requesting a given net in the layout or schematic and highlighting it in L-Edit and S-Edit. EVI can also query RVE for the location of particular devices in the layout or schematic by device name or from the cursor's current position.

## Finding Shorts and Opens

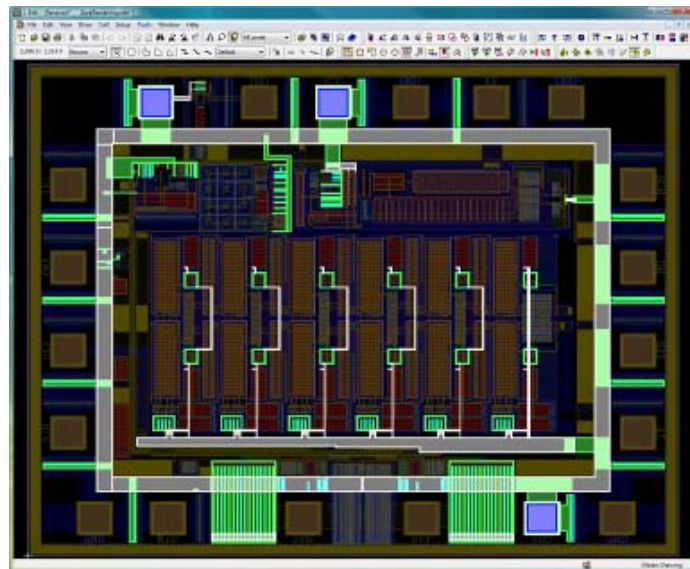
When tracking down shorts and opens on complicated nets in layout, EVI can highlight a net by marking only specified layers or by marking each layer of the net in a different color. Calibre RVE's advanced short isolation function can minimize the short network to make the short easier to find.

## Pinpointing Parasitics

Designers can also browse extracted parasitic results in Calibre RVE and L-Edit/S-Edit, sorting parasitic results by net name or by value to find those nets of greatest interest. EVI can highlight the resistance, capacitance to substrate, and coupling capacitance in the layout or schematic. This allows designers to pinpoint the specific layout geometry causing the largest parasitics, then modify the layout to minimize any parasitic effects.

## For More Information

To find out more about simplifying your flow by integrating Tanner Tools with Mentor and Cadence verification tools, contact us at [www.tannereda.com](http://www.tannereda.com).



Net Highlighting with different net layers in different colors

## About Tanner EDA

Tanner EDA is a leading provider of PC-based electronic design automation (EDA) software solutions for the design, layout and verification of analog/mixed-signal ICs, ASICs and MEMS. Its solutions help speed designs from concept to silicon and are used by thousands of companies to develop devices cost-effectively in the biomedical, consumer electronics, next-generation wireless, imaging, power management and RF market segments. Founded in 1988, Tanner EDA is a division of privately held Tanner Research, Inc.