

CoStar Design Director™

CoStar Design Director™ is a scalable and robust platform to automate all aspects of hardware/software interface design, verification, firmware, and documentation.

CoStar (Configuration Status Register) is built on three innovations: CSRCompiler™, the CSRSpec™ Language and CSRConfigurator™.

CoStar provides multi-language support without the need for specialized interfaces or additional scripting. In response to customer requests, Semifore continues to provide functionality not available in UVM, IP-XACT, and SystemRDL. CoStar incorporates an Agile Design Process to ensure best practices and early engagement by the entire design team.

CoStar identifies IP integrity issues to ensure clean import of third-party IP or internal legacy data. It performs a strict lexical analysis, parse tree evaluation, and semantic check of third-party files. The semantic checking extends beyond standards to ensure the address map is self-consistent and will allow the generation of valid RTL.

Solving Register Map Complexity

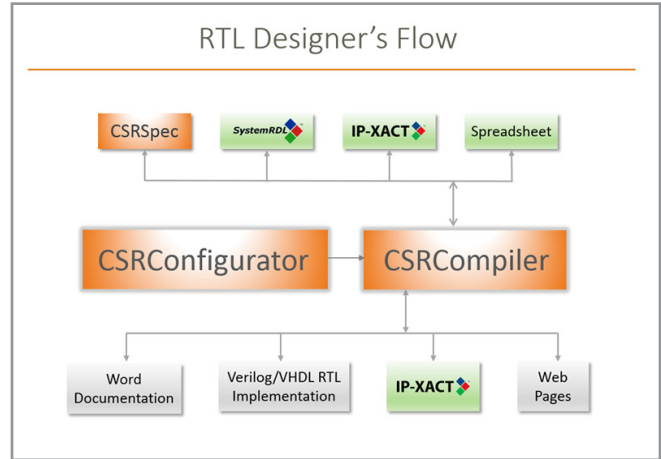
SoC designs have reached tens of thousands of configuration and status registers – in some cases two or three orders of magnitude more – on a single chip.

With these thousands of registers have come substantial design challenges, with productivity and design integrity at the forefront. CoStar works at the register behavior level of abstraction, in the architectural design phase, to solve these problems. CoStar specifies design intent via our CSRSpec language and is implemented in a flexible register address map hierarchy. It provides an intuitive management system that processes the register specification, or map,

of the design. These register maps are the behavioral foundation for the chip that ultimately define its functionality, performance and behavior.

Documentation

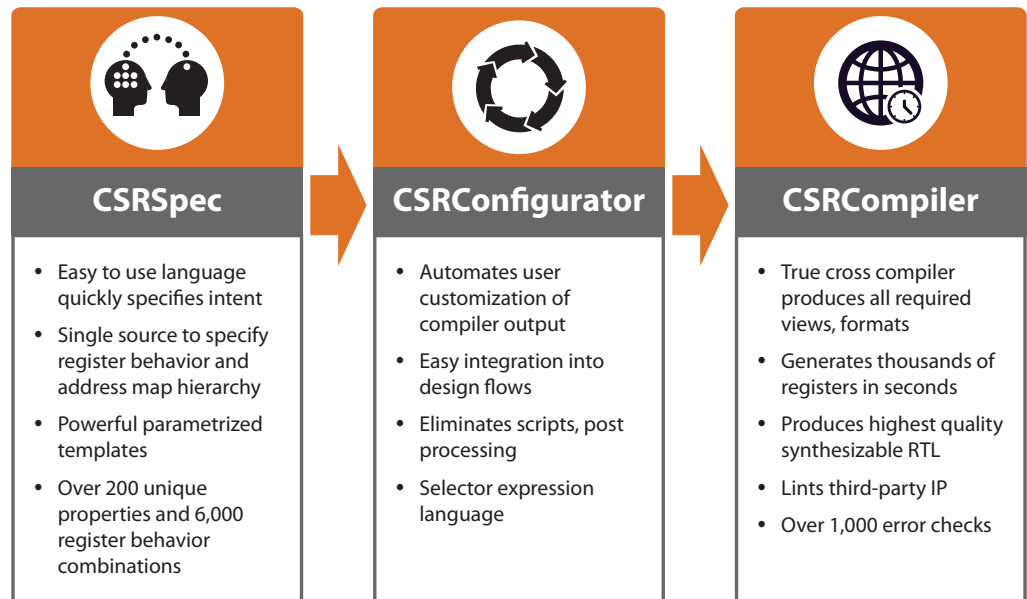
CoStar automatically documents changes across entire functional teams, ensuring a reliable, up-to-date specification is being used at all times. It provides a single-source specification for register and memory-map information fully configured for all teams in the formats and views they require. All teams – functionally diverse and geographically separate – remain perfectly synchronized.



Single Source Methodology

CoStar is unique in that all aspects of the design originate from a single source. CoStar generates a single source implementation of synthesizable RTL at the push of a button. This single source enables instantaneous iteration and documentation across design teams while guaranteeing that all information

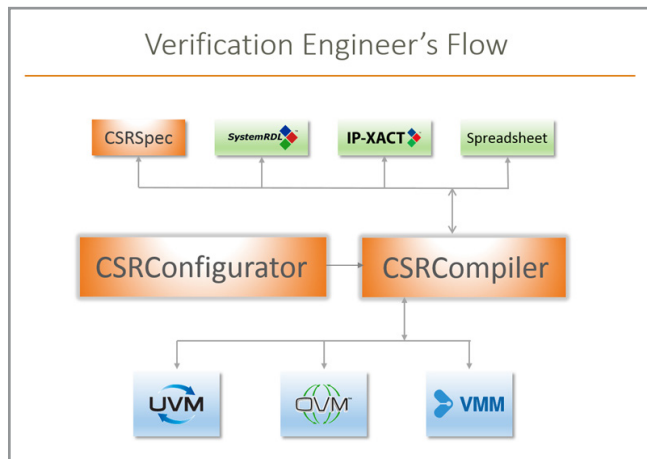
CoStar Design Director Platform



is absolutely correct. It is extremely flexible and allows multiple input formats to be linked to create the single source, and it provides customized output for the individual needs of the entire design team.

CSRCompiler™

The power behind the CoStar Design Director platform, CSRCompiler provides orders-of-magnitude performance improvements while solving complex SoC issues. A true cross compiler engine with over 1000 functional, behavioral, syntactic, and semantic error checks, it is extremely fast and generates superior quality synthesizable RTL. Proven to compile over one million configuration and status registers in minutes, CSRCompiler automates all views and formats for register design. Innate to the compiler is its ability to lint intellectual property from third-party or internal legacy data, ensuring data is clean, verified and ready for use.



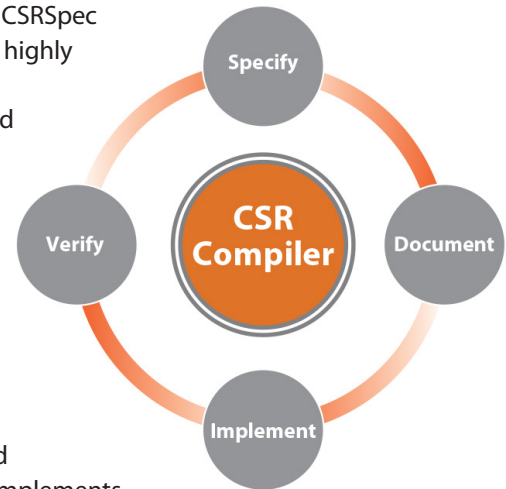
CSRCompiler accepts IP-XACT, SystemRDL, spreadsheets and internal formats to generate both industry standard output and output customized for design teams.

- True cross compiler produces all required views, formats
- Generates thousands of registers in seconds
- Produces highest quality synthesizable RTL
- Lints third-party IP
- Over 1,000 error checks

CSRSpec Language™

Created by Semifore, the CSRSpec language provides a single source to specify register behavior and address map hierarchy of a chip. A defacto standard among many customers, it is a terse and easy to understand language. It includes over 200 unique properties and 6,000 register behavior combinations. When compiled, the language expands to a full implementation high quality RTL ready

for synthesis. CSRSpec also provides highly configurable parameterized templates to promote design reuse and consistency between teams.



- Easy to understand language implements superior synthesizable RTL
- A single data source to generates RTL, firmware headers, verification class instances, and documentation outputs
- Promotes repeatability, scalability and legacy data reuse
- Natively interfaces with industry standards and those not currently available (bus, memory, wide data paths)

CSRConfigurator™

The CSRConfigurator fully customizes outputs of the CSRCompiler no matter the application, with no additional scripting or manual intervention needed. It ensures each member of the design team receives the data in a way that will immediately plug into their design flow. It is the configurable conduit to enable customizable output for each specific aspect of the design.

- Automates user customization of compiler output
- Easy integration into design flows
- Eliminates scripts, post processing
- Selector expression language



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