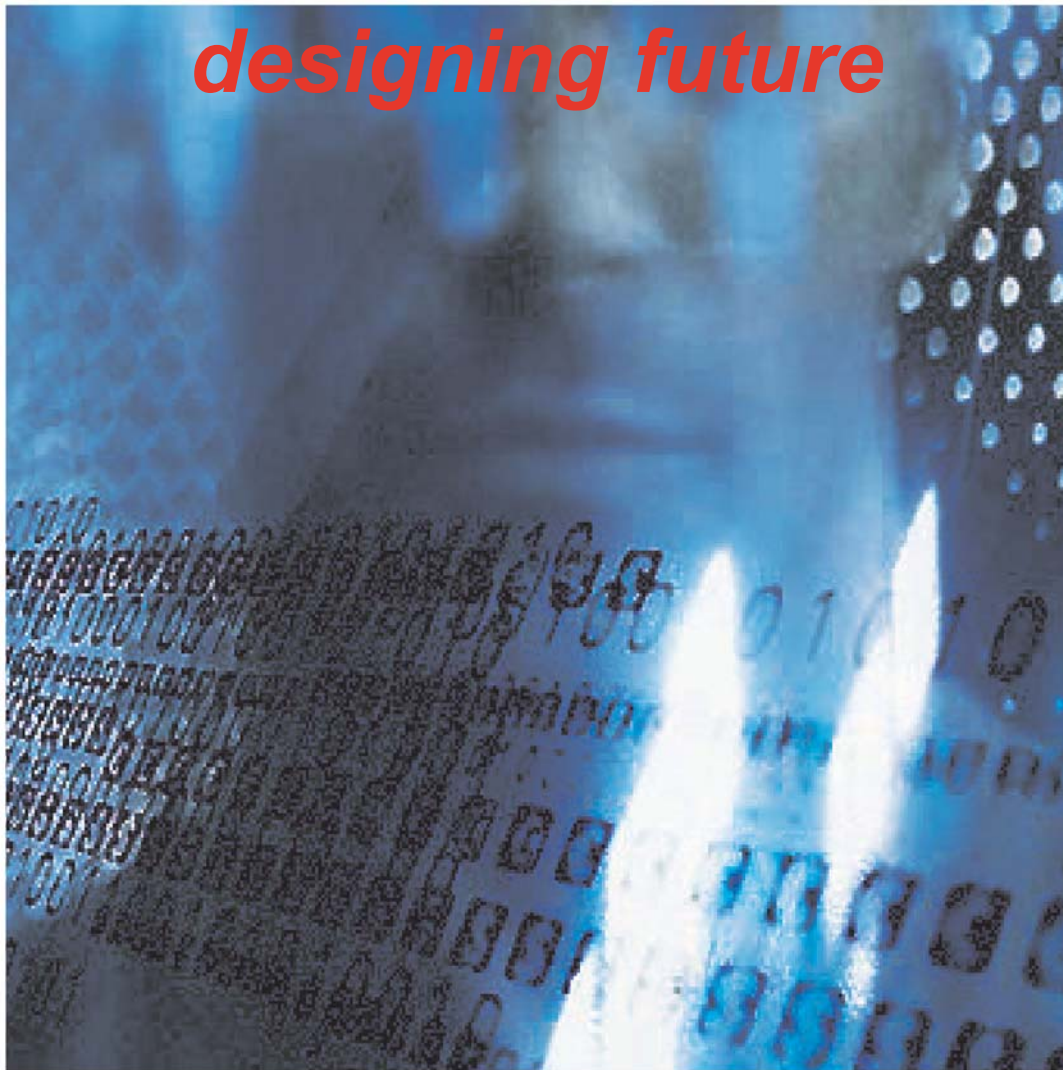


Top Notch Solution Providers in design & Verification for
SoC / ASIC / FPGA / IP



designing future



Delivering high quality services with technical excellence, continuous innovation, passion and unyielding integrity.

Why Kacper?

- ▶ Providing complete solutions in Architecture, Design, Synthesis, Verification of SoC/ASIC/FPGA /IPs.
- ▶ We help customers doing SoC/ASIC/FPGA/IP Designs and support by using the latest tools and methodologies.
- ▶ Specialized in telecom, processors, peripherals, automotive protocols, 3rd-party IP integration and reuse.
- ▶ Customer friendly Business Engagement Models.
- ▶ Transparent and robust Project Management.

Design Services

At Kacper we add value to the designs of our customers by leveraging systems knowledge, expertise particularly in the telecom protocols and automotive protocols.

Our capabilities :

- ▶ Development of architecture at macro and micro level.
- ▶ Implementation of RTL using Verilog/VHDL/System Verilog.
- ▶ Synthesis of RTL for SoC/ASIC/FPGA/IPs.

Our skillsets :

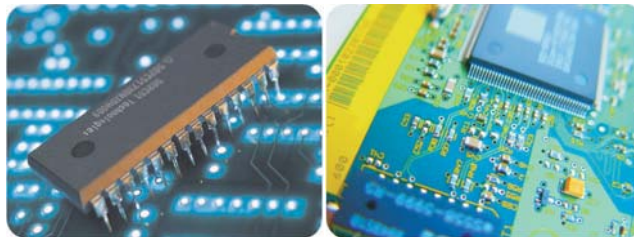
- ▶ Hardware Description Languages like Verilog, VHDL and System Verilog.
- ▶ Domain expertise in SONET/SDH, Next Generation SONET/SDH, 10GbE, CAN and FlexRay.
- ▶ Development of test benches, test vectors, test automation tools using System Verilog and scripting languages like Perl, C-Shell, TCL.

Our deliverables :

- ▶ Design documents.
- ▶ RTL source code.
- ▶ Synthesis scripts.
- ▶ Test benches and Test suites.

Key benefits :

- ▶ Lower rate of failure or re-spin. Reduced time to market.
- ▶ Remarkable improvement in development productivity.
- ▶ Cost effective.



■ Verification Services

Kacper Technology enables you to rapidly build verification environments there by helping you to achieve your design and verification targets through our unique blend of innovative tools and technologies.

- ▶ Our verification methodology helps to build highly layered, scalable, reusable and extensible verification environments for module and SoC/ASIC/FPGA/IP level verification, providing maximum functional coverage.
- ▶ Engineers at Kacper Technologies are equipped to provide proven and innovative solutions, to solve verification needs.
- ▶ Kacper Technologies provides complete verification solutions right from verification plan to seeing the silicon tape-out.

■ Our capabilities :

- ▶ Development of Verification Plan.
- ▶ Development of reusable verification environment at module, chip or SoC level using Verification Methodologies like VMM and OVM.
- ▶ Development of Self-Checking Test cases and Regression Suites.
- ▶ Development of Assertion Based Checkers and Protocol Monitors.
- ▶ Functional and Code Coverage Analysis.
- ▶ Test case execution and analysis.
- ▶ Verification report generation.

■ Our skillsets :

- ▶ Hardware Verification Languages: System Verilog.
- ▶ Verification Frameworks: VMM,OVM.
- ▶ Verification Technologies: Constrained Random Stimulus Generation, Assertion Based Verification and Coverage Driven Verification.
- ▶ Domain Knowledge: Ethernet/10 Gigabit Ethernet, SONET/SDH, Next generation SONET/SDH, Automotive Protocols like CAN and FlexRay.

■ Our deliverables :

- ▶ Verification Plan.
- ▶ Verification Report.
- ▶ Test Benches and Test Suites.
- ▶ Support Scripts.
- ▶ Verification IPs.

■ Key benefits :

- ▶ Extensive design experience, knowledge of standards, portfolio of IP's and customer orientation helps our customers to bring their product faster to the market.
- ▶ Provides end to end verification assurance so that the customers can focus on more critical issues like product conceptualization, architecture, features, performance etc.
- ▶ Enables accelerated verification of DUT with independently developed verification IP's.
- ▶ Finds bugs faster, there by reducing the rate of failure or re-spin.

■ Products

■ Design IP

▶ SONET/SDH Design IPs

SONET/SDH has become the worldwide standard for interface and multiplexing of user information to optical networks. SONET/SDH systems allow much greater network flexibility and management over existing optical systems. Kacper provides framing, pointer processing and overhead processing solutions.

■ Features :

- ▶ Compliant with SONET GR-253-CORE and SDH ITU-T G.707.
- ▶ The framer supports standard SONET mappings down to OC-48 channels and can be used either as a single OC-48 framer or four individual OC-12 framers.
- ▶ Provides access to internal registers through a Control Interface.
- ▶ Performs Byte & Frame Alignment on the Receive Signal.
- ▶ Pointer Processors at STS/STM and VT/TU levels.
- ▶ Generates Frame Co-ordinates (N, row, column) for path processing. Accepts external synchronization pulse for the transmit start of frame.
- ▶ Inserts the Framing Bytes (A1, A2) and Section Trace J0 Byte or STS-1 ID (C1).
- ▶ Optionally inserts the section and line data communication channels (D1-D3) or (D4 – D12).
- ▶ Optionally inserts register programmable APS Byte failure (K1, K2) and synchronization status S1 Bytes.
- ▶ Computes and inserts section BIP-8 (B1), line BIP-8 (B2), path BIP-8 (B3) and Path Far End Block Error FEBE (G1).
- ▶ Optionally scrambles the Transmit Frame data and optionally descrambles the receive frame data.
- ▶ Remote defect, error and failure indications (AIS-L, AIS-P, AIS-V, MSAIS, AU-AIS, TU-AIS).
- ▶ Pass through of TOH bytes.
- ▶ Supports 16-bit asynchronous and synchronous microprocessor interface up to OC-48.
- ▶ Fully synthesizable Register Transfer Level (RTL) Verilog/VHDL Core.

■ Verification IP

▶ Next Generation SONET/SDH

■ Outline :

NG-SONET/SDH IP is a comprehensive solution for pre-silicon functional verification of NG-SONET/SDH designs. It is developed using System Verilog and adheres to VMM and OVM. It is a highly reliable and configurable solution available for the verification of Next Generation SONET /SDH systems with an extensive test suite that allows design and verification engineers to quickly and extensively test the entire functionality of their NG-SONET/SDH compliant designs.

■ Features :

- ▶ Compliance to Bellcore GR-253, ITU G.707, G.7041 and G.7042.
- ▶ Reusable Verification IP, Scalable, Modular.
- ▶ Predefined cover points defining functional coverage.
- ▶ Constraint Random Verification along with a choice of driving directed test cases.
- ▶ Efficient error insertion mechanism.
- ▶ Assertion based checkers for checking the functionality of pointer processor, framer and alarms.
- ▶ Simple hookup and interaction without any special interfaces.
- ▶ Ability to interact with various design languages.

● SONET/SDH

- ▶ Completely configurable at all levels of SONET/SDH upto STS-192/STM-64.
- ▶ SONET/SDH overhead control and decode.
- ▶ Alarm and error Insertion capabilities.
- ▶ Configurable to cover all kinds of pointer adjustments (STS/STM and VT/TU Level).

● GFP (Generic Framing Procedure)

- ▶ System level capability of end-to-end frame delineation.
- ▶ Support for both client management and data frames.
- ▶ Ethernet frames generation via GFP-F.

● VCAT (Virtual Concatenation)

- ▶ VCAT Path overhead bytes control and decode on each member.
- ▶ VCAT Error injection or alarm generation on each member.

● LCAS (Link Capacity Adjustment Scheme)

- ▶ Emulation of Source and Sink state machines (per member).
- ▶ Generation and capture of member status information.

Verification IP - 10 Gigabit Ethernet.

■ Verification IP

▶ 10 Gigabit Ethernet

■ Outline :

The accelerating growth of worldwide network traffic is forcing service providers, enterprise network managers and architects to look to ever higher-speed network technologies in order to solve the bandwidth demand crunch. We at Kacper Technologies are developing 10 Gigabit Ethernet Verification IP to test the entire functionality of 10 Gigabit Ethernet DUT.

■ Features :

- ▶ Quickly validates interpretation and implementation of the Gigabit and 10 Gigabit Ethernet standards.
- ▶ Constantly monitors Gigabit and 10 Gigabit Ethernet behaviors during simulation.
- ▶ Enables rapid application of static and dynamic formal verification to validate interface designs.
- ▶ Emulation of Source and Sink state machines (per member).
- ▶ Generation and capture of member status information.
- ▶ Measures structural coverage to grade test bench efficiency across multiple simulations and formal verification.
- ▶ Errors, statistics, and corner cases can be analyzed in assertion management environment.

Business Engagement Model.



Business Engagement Model

- ▶ Since Business requirements differ from company to company, Kacper Technology offers an engagement model that accommodates a wide range of client requirements.
 - ▶ Kacper Technology partners with customers through various modes of engagement on different levels – in terms of taking responsibility for a customer’s R&D requirements, location of the team and pricing model chosen.
 - ▶ Our different working models give our customers the flexibility of choosing how they would like to work with us.
- **Complete Product Development :**
 - ▶ In this model of engagement, Kacper takes complete responsibility of customer’s product(s) from concept-to-market. This helps customers to focus on ideating next-generation products.
 - **Modular Development :**
 - ▶ This happens when customers outsource the development of bits and pieces of their product(s) to Kacper. Product integration skills to put together these modules become a key aspect for both the customer and Kacper.
 - **Co-Development :**
 - ▶ This is a model where the customer and Kacper work in a coordinated manner to develop a product . Kacper’s team is considered an extension of the customer's team and has all the rights and privileges to work on the customer's code base.
 - **Specific Services :**
 - ▶ Generation and capture of member status information.
 - ▶ Here, customers outsource certain activities of the product lifecycle, such as testing, documentation or product implementation, but not the core development activity itself.
 - ▶ This helps customers develop a comfort level with Kacper's capabilities; another key advantage of this model is that the source code of the product does not have to be shared with Kacper to begin working together.

Contact.

■ Location

- **Pure offshore :**

- ▶ In this model the development effort fully happens in Kacper's offshore Development Center at Bangalore and the customer takes care of project management. This works out to be the most cost effective working model, in terms of location, for the customer.

- **Onsite /offshore :**

- ▶ Kacper's onsite/offshore model provides customers the satisfaction of co-ordinating and discussing requirements and deliverables with an onsite Kacper team, while enjoying the benefits of offshore outsourcing. This is the preferred model when the client wants to achieve more within his budget and the project requirements are better understood.



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