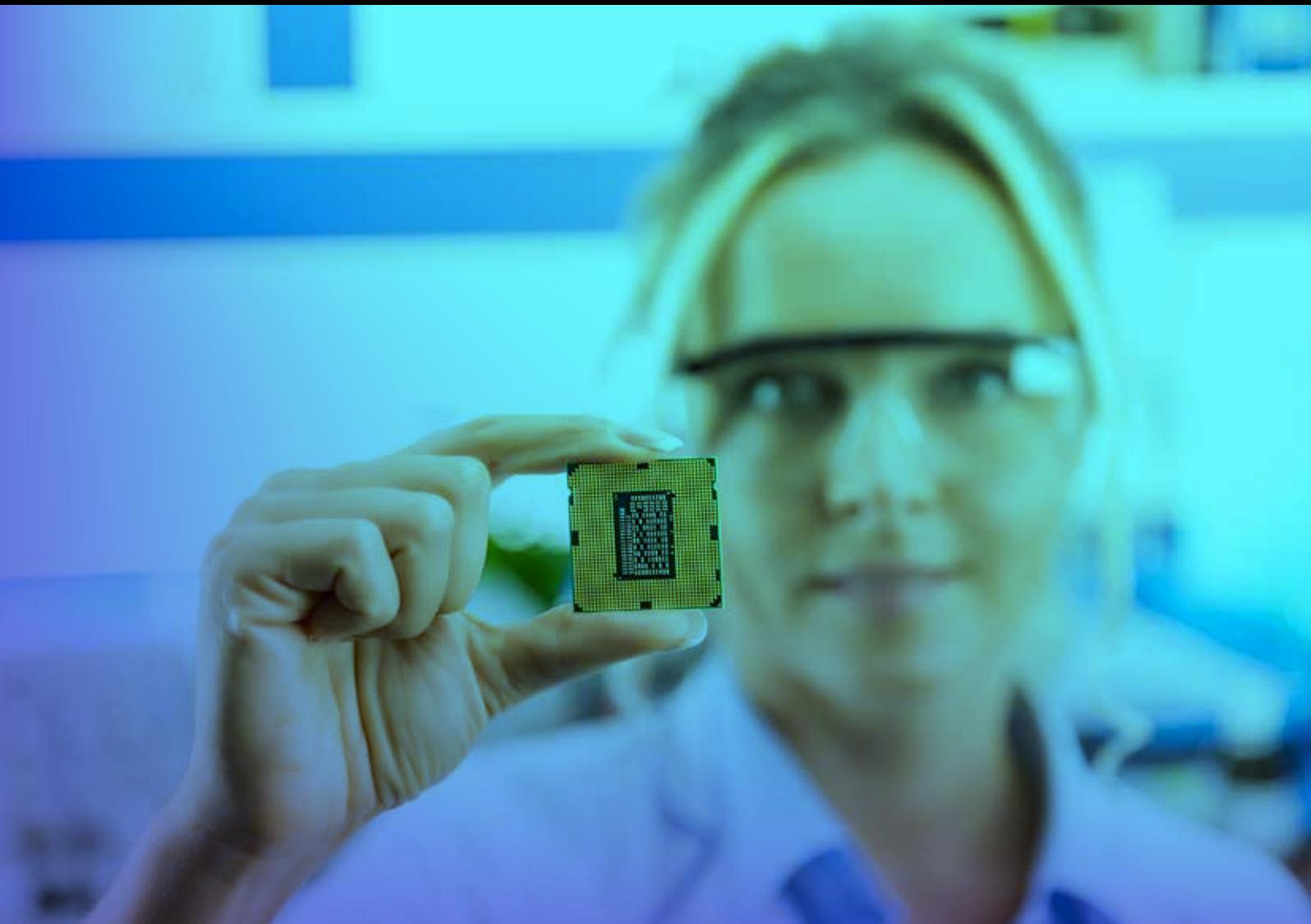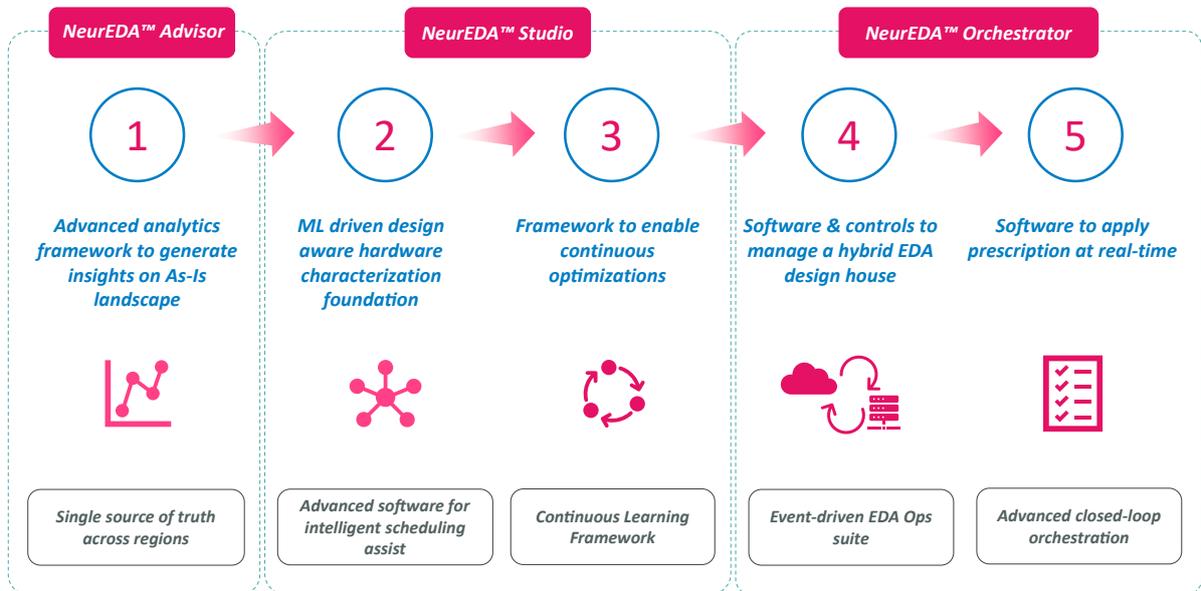# TCS NeurEDA™

Technology Business Unit

Semiconductor companies are constantly innovating and designing chips that are increasing in complexity and diversity. This has created an unprecedented surge in the volume and variety of compute and storage platforms for design simulations. The existing on-prem high-performance computing (HPC) server farms are unable to meet these needs and require significant investments to upgrade and manage, resulting in considerable delays in innovation. A pragmatic alternative is to leverage cloud platforms that provide instantaneous access to high-end infrastructure and requisite tools on demand.

TCS NeurEDA is a secure, intelligent, and autonomous toolkit that is purpose built to simplify scheduling, management, and orchestration of complex hybrid cloud electronic design automation (EDA) jobs. It acts as a holistic control system for a distributed hybrid server farm with a focused objective of optimizing total cost of ownership (TCO).

Overview

Continuously adding HPC servers to cater to the increased needs of EDA workloads is not a feasible approach. Augmenting on-prem infrastructure resources with public cloud to accelerate design cycles is an efficient strategy in optimizing innovation budgets for semiconductor design teams. However, harnessing the abundance of infrastructure in this hybrid environment and managing resources with the cloud provider's native tools in a secure and optimal way is arduous and needs a sophisticated solution.

NeurEDA provides a comprehensive toolkit that automates each step in EDA job management. This includes everything from migrating the necessary heavy design artifacts in a cost-effective manner to performing design-aware dimensioning of the infrastructure to optimize the overall cost. NeurEDA applies the standard IT-approved security practices automatically to every step so that both burst and pure play cloud designs are secure. It orchestrates all aspects of EDA design management on a hybrid server farm, from setting up the required resources and licenses to performing design-aware job scheduling and offers an operational dashboard and seamlessly stiches on-prem and public cloud platforms to a common fabric. The toolkit offers a suite of software services enabling design teams to provide highly reliable, secure, and on-demand EDA engineering environments.

NeurEDA™ Advisor	NeurEDA™ Studio		NeurEDA™ Orchestrator	
1	**2**	**3**	**4**	**5**
Advanced analytics framework to generate insights on As-Is landscape	ML driven design aware hardware characterization foundation	Framework to enable continuous optimizations	Software & controls to manage a hybrid EDA design house	Software to apply prescription at real-time
Single source of truth across regions	Advanced software for intelligent scheduling assist	Continuous Learning Framework	Event-driven EDA Ops suite	Advanced closed-loop orchestration

Our Solution

TCS NeurEDA includes:

- **NeurEDA Advisor:** Performs data-driven assessment of existing EDA landscape to recommend most effective and secure approach for augmenting existing infrastructure with a cloud platform to meet the business objectives.

- **NeurEDA Studio:** Provides actionable insights that drive critical decisions required to efficiently design a modern EDA landscape. The insights provide reliable metrics to accurately determine required infrastructure and licenses through advanced analytics and ML models built on historical data. It provides a framework to enable continuous optimizations of ML models to improve predictions.

- **NeurEDA Orchestrator:** Offers proprietary design-aware AI-based algorithms that assist in seamless operations of hybrid cloud EDA environment. The zero-touch orchestrator helps improve productivity of the design teams by selecting optimal cloud configurations and assists in intelligent real-time scheduling of EDA workloads to reduce cycle times.

Benefits

- **Accelerated design innovation:** Automated functions and services accelerate design time by up to 40%.

- **Reduced TCO:** Intelligent design-aware and budget-driven resource allocation reduces TCO by 30%.

- **Improved utilization:** Advisor services help improve utilization of on-prem HPC infrastructure by up to 30%.

- **Resilient design environments:** Event-driven autonomous job orchestration services to create and provide fully automated and highly available application-specific integrated circuit (ASIC)/ system on a chip (SoC) design environment.

- **Protected investments:** The modular nature of NeurEDA enables reuse of existing investments such as licenses, on-prem server farm managers, and current public cloud partnerships.

- **Optimal hyperscaler recommendation:** The intelligent cloud candidature assessment algorithms analyze critical EDA design and verification characteristics and recommend the best-suited hyperscaler platform.

The TCS Advantage

NeurEDA is supported by TCS' industry knowledge and broad-spectrum prowess in technical skills. By partnering with TCS, our customers reap the benefits of the following:

- **Domain expertise:** A very large-scale integration (VLSI) center of excellence (CoE) that specializes in semiconductor design, verification, and validation provides differentiated product engineering services for the semiconductor industry.

- **HPC expertise:** A dedicated center for advanced computing to develop solutions in HPC infrastructure tuning and optimization, and high-performance data analytics (HPDA). It enables efficient adoption of HPC techniques for various industry workloads.

- **Cloud expertise:** Proven capabilities and intellectual property (IP) across cloud advisory and assessment, product development, adoption planning and execution, cloud security, and operations, along with strong contextual knowledge and experience across various industry domains.

- **Strategic alliances:** Extensive partnerships with leading public cloud providers including Amazon Web Services, Google Cloud Platform, and Microsoft Azure.

- **Industry recognition:** TCS has been recognized as leader in semiconductor engineering services by leading industry analyst Everest Group.

Awards and accolades

Contact

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About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organisation that has been partnering with many of the world's largest businesses in their transformation journeys for over 50 years. TCS offers a consulting-led, cognitive powered, integrated portfolio of business, technology and engineering services and solutions. This is delivered through its unique Location Independent Agile™ delivery model, recognised as a benchmark of excellence in software development.

A part of the Tata group, India's largest multinational business group, TCS has over 500,000 of the world's best-trained consultants in 46 countries. The company generated consolidated revenues of US $22.2 billion in the fiscal year ended March 31, 2021 and is listed on the BSE (formerly Bombay Stock Exchange) and the NSE (National Stock Exchange) in India. TCS' proactive stance on climate change and award-winning work with communities across the world have earned it a place in leading sustainability indices such as the MSCI Global Sustainability Index and the FTSE4Good Emerging Index. For more information, visit www.tcs.com.