

How are you using blockchain to re-imagine your industry?

Starlight*
Zero-knowledge-proof (ZKP) compiler

* Starlight is an internal project name at EY for code related to privacy/ZKP on a blockchain. *This code is not owned by EY teams and EY teams provide no warranty and disclaims any and all liability for use of this code. Users must conduct their own diligence with respect to use for their purposes, and any and all usage is on an as-is basis and at your own risk.

Use Case – Starlight

Starlight is a compiler which helps turn ordinary smart contract code into a privacy-preserving one using zero-knowledge. It assists blockchain developers to create a framework for customized zero-knowledge-proof (ZKP) smart contracts without any need for deep mathematical knowledge or months-long development timelines.

Your business needs

With tools and solutions from EY, you can run your essential business applications, including private transactions and zero-knowledge applications on public Ethereum:

- ▶ Transacting privately on a public chain. Immutable, non-disputable, transparent autonomous code execution which cannot be tampered, or altered.
- ▶ Businesses prefer privacy on public chain.
- ▶ Day-to-day tasks for your business, which require privacy, such as purchase orders or billing, can now be easily migrated to blockchain.
- ▶ Simplicity and speed to market for the creation of new, secure and private smart contracts.

Your specific challenges

- ▶ Complex math and long-lead times to implement privacy.
- ▶ Business landscape is evolving and blockchain technology is enabling smarter and faster way to transact.

How Starlight can help

From supply chain to procurement to sustainability, EY blockchain's APIs and zero-knowledge tools make public Ethereum accessible:

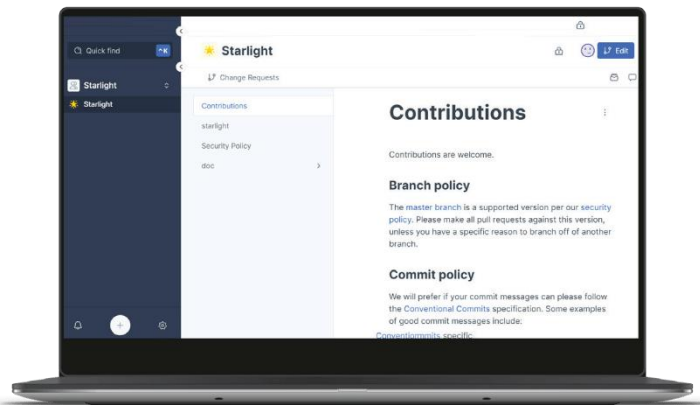
- ▶ Starlight assists in modifying smart contracts to transact privately on the public chain.
 - ▶ Enables an efficient way to transact privately on the public blockchain, which may present new opportunities.
- To use the public blockchain.
- ▶ Businesses can now consider moving off potentially more restrictive private chains.

Potential business benefits

- ▶ **Helps Implement privacy on public blockchains:** Starlight allows enterprises to reap the benefits of public blockchains, such as computational integrity and transparency, while helping keep sensitive information private.
- ▶ **Compiles a privacy enabled smart contract – no need for a developer team, mathematicians, or cryptographers:** Starlight does not need a mathematics degree to use. It simply needs a smart contract as an input and helps create a privacy-preserving one.
- ▶ **Fast and easy to use:** In a few seconds, the application is created and comes complete with tests, API endpoints, and startup scripts.

Application features and functionality

- ▶ **Offers complete privacy:** Starlight creates a commitment system with widely used and trusted hash functions and cryptographic protocols, ensuring your information can't be seen, edited, or removed by anyone but those you choose.
- ▶ **Compiles the large majority of Solidity, handling complex logic:** The compiler can understand and convert most computational logic into circuit, contract, and orchestration code, including mappings, structs, and arrays.
- ▶ **Comes with many built-in usability features:** A compiled Starlight application comes complete with tests, API endpoints, and startup scripts.



Why EY

Our global EY blockchain team of more than 1,000 is recognized as a technology leader in the blockchain space, delivering one software-as-a-service infrastructure. EY has committed \$100 million into blockchain engineering research over the next three years.

Starlight was launched into the public domain in 2021 as a prototype business logic compiler to facilitate the creation of zkApps, or decentralized applications that use ZKP technology.

Continuing the conversation

If you would like to learn more about Starlight, please contact:



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