

IOHK Launches Secure Smart Contracts Technology

Plutus and Marlowe allow businesses to create smart contracts for Cardano blockchain

Edinburgh, December 11, 2018 — IOHK, the leading blockchain research and development company, today announces two tools developed by a world-leading team for writing smart contracts for the Cardano blockchain. Plutus and Marlowe launched in test format at the first PlutusFest conference in Edinburgh, Scotland, a public event including academics, business professionals and developers. These powerful tools will enable start-ups, the financial services and fintech industries, and academia to prepare blockchain contracts that will run on Cardano.

Plutus provides a general purpose programming language and tools for Cardano. IOHK's scientists and engineers have combined the discipline of the Haskell functional language with Cardano to create a platform for fintech developers to write secure and robust smart contracts. IOHK has provided an easy-to-use exploratory development and testing environment for Plutus contracts based on a novel blockchain emulator, called Plutus Playground. These contracts are ready to be deployed to the blockchain itself.

For non-programmers, Marlowe is a simple way to generate code and create software products. It is an easy-to-use tool that enables professionals in the finance industry who have no programming background to build automated financial contracts on the blockchain. Marlowe comes with its own web-based testbed, Meadow.

IOHK CEO Charles Hoskinson said: "We're really excited to release testbeds of Plutus and Marlowe so developers, finance professionals and academics can test how they can use smart contracts on Cardano. Both technologies are a major step forward for the blockchain industry. They have been rigorously designed by a team of leading experts in programming language design, with the aim of reducing the kinds of software bugs that have led to huge losses totalling hundreds of millions of dollars."

Potential benefits from applying blockchain technology are massive. Renewing and reviving the infrastructure of the global financial system will bring costs down and allow the emergence of new companies as digital disruptors in financial services and other industries. In financial trading alone, Goldman Sachs, the US investment bank, has estimated that blockchains could cut out errors in clearing and settling trades in cash equities, leading to savings of \$11 billion a year.*

The International Swaps and Derivatives Association (Isda) – which sets standards for a market with notional amounts outstanding of almost \$600 trillion – has recently published its Common

Domain Model**. This common foundation will allow distributed ledger technology such as Plutus and Marlowe to be introduced to the industry.

Philip Wadler, the area leader for programming languages at IOHK, said: "IOHK is unique among cryptocurrency firms for its insistence on basing its development on peer-reviewed research, and one of the few to support rapid and reliable development by using the functional language Haskell. Plutus continues these trends. Where programming Ethereum requires coding in two languages, Solidity for the on-chain code and Javascript for the off-chain parts, and other systems suffer a similar split, Plutus is the only system that provides an integrated language for both, based on Haskell"

"Its core language for on-chain code has been kept extremely simple to make it future-proof and so it supports verification. The core is taken directly from the work of the French logician Jean Yves Girard and the US computing researcher John C Reynolds, who independently invented the same system. We have a crack team of world-leading researchers and developers designing, implementing, and formalising Plutus."

Building on their experience from the launch of Ethereum, Charles Hoskinson and Jeremy Wood, the founders of IOHK, have created a groundbreaking strategy for the Cardano blockchain. This combines academic rigour with the formal discipline and correctness of Haskell in the hands of a world-class development team to bring an unparalleled level of reliability and security to Cardano and the ada cryptocurrency.

This strategy, with its focus on mathematical probability for security and reliability, puts Plutus and Marlowe at its core for developing smart contracts to run on Cardano for real-world applications when the network is decentralized in 2019.

The first PlutusFest, which brings these innovations to prominence, will be hosted by the Edinburgh Blockchain Technology Laboratory at the University of Edinburgh in December 2018. This facility was established in February 2017 as the headquarters for IOHK's network of global university partnerships. Edinburgh is the centre for Scotland's financial services industry, the largest in the UK outside London.

For more information, please visit www.plutusfest.io

***<https://github.com/bellaj/Blockchain/blob/master/Goldman-Sachs-report-Blockchain-Putting-Theory-into-Practice.pdf>

**<https://stats.bis.org/statx/srs/table/d5.1>

<https://www.isda.org/2018/06/05/isda-publishes-digital-iteration-of-the-common-domain-model/>

<https://www.slideshare.net/kleech/the-value-of-derivative>





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IOHK CEO Charles Hoskinson and Professor Philip Wadler are available for interview

About IOHK

Founded in 2015 by Charles Hoskinson and Jeremy Wood, IOHK is a technology company committed to using peer-to-peer innovations to provide financial services to the three billion people who don't have them. IOHK is an engineering company that builds cryptocurrencies and blockchains for academic institutions, government entities and corporations. It is also a research firm with dense academic connections in Europe, the US, and Asia with many employees holding PhDs in computer science, mathematics or physics. IOHK focuses on practical, peer reviewed research to create live protocols, and the technological underpinnings to next-generation cryptocurrencies. To learn more, visit iohk.io