

The Importance of an agnosing plaform bytecode for a decentralized network

Gabriele Miotti

May 2023

Abstract

How can a distributed network agree on the execution of an arbitrary code in an trust-free way? Currently there is plenty of solution to achieve that, every solution differs by the network's structure and protocols but the common ground is the presence of a bytecode that is able to run arbitrary code in a deterministic manner. The following 'paper' will describe the basic characteristics of an Platform Agnostic Bytecode and how is used in Polkadot, a distributed network that 'aims to provide a scalable and interoperable framework for multiple chains with pooled security'(polkadot-overview paper).

Contents

1	Agnostic Platform Bytecode	2
1.1	Definition of an APB	2
1.2	Key features of an APB	2
1.3	Current usage of APBs	2
1.4	APBs used in blockchains	2
2	Polkadot	2
2.1	What's Polkadot?	2
2.2	Polkadot protocol	2
2.3	APBs in Polkadot	2
2.3.1	Key features request for an APB	2
2.3.2	Usage of APB in Polkadot	2
3	WASM	3
3.1	History	3
3.2	Specifications	3
3.3	Sandboxing	3
3.4	Execution	3
3.4.1	Interpreter	3
3.4.2	Single pass Interpreter	3

3.4.3	JIT	3
3.4.4	Compilation	3
4	WASM Competitors	3
4.1	EVM	3
4.2	Solana eBPF	3
4.3	LLVM	3
4.4	eBPF	3
4.5	RISC-V	3

1 Agnostic Platform Bytecode

- 1.1 Definition of an APB
- 1.2 Key features of an APB
- 1.3 Current usage of APBs
- 1.4 APBs used in blockchains

2 Polkadot

- 2.1 What's Polkadot?
- 2.2 Polkadot protocol
- 2.3 APBs in Polkadot
 - 2.3.1 Key features request for an APB
 - 2.3.2 Usage of APB in Polkadot

STF

SmartContracts

SPREE

3 WASM

3.1 History

3.2 Specifications

3.3 Sandboxing

3.4 Execution

3.4.1 Interpreter

3.4.2 Single pass Interpreter

3.4.3 JIT

3.4.4 Compilation

4 WASM Competitors

4.1 EVM

4.2 Solana eBPF

4.3 LLVM

4.4 eBPF

4.5 RISC-V