

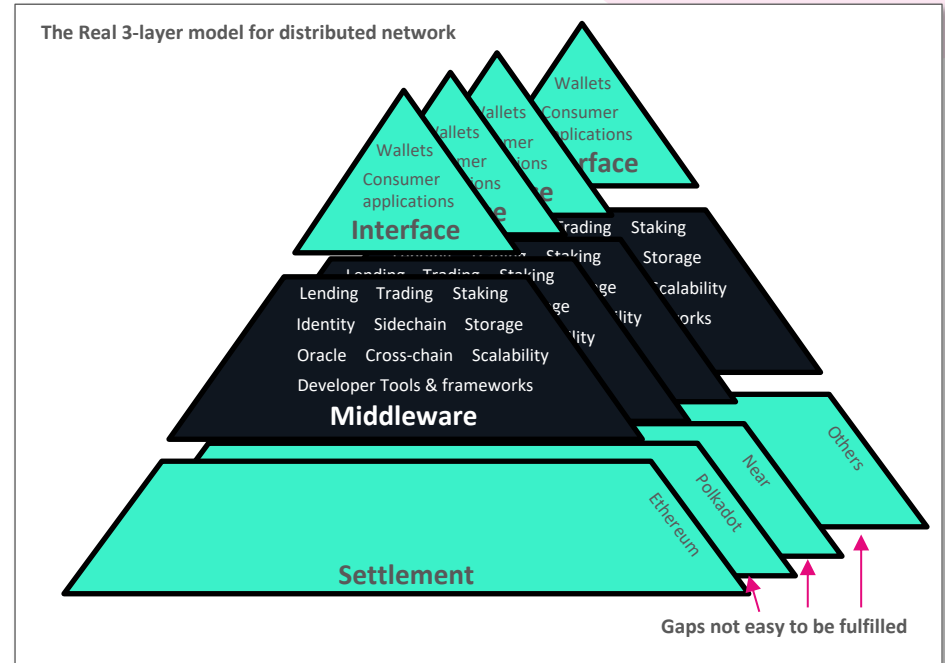
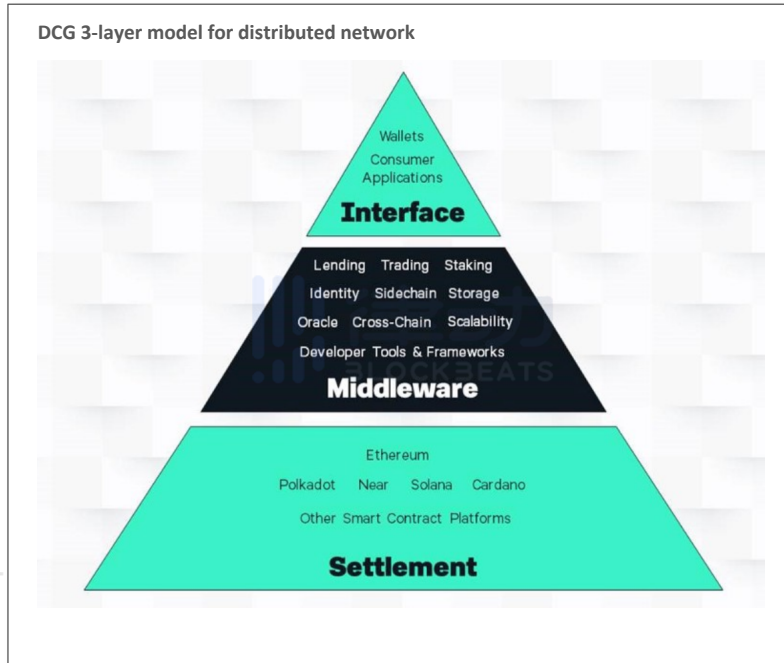


A unified toolchain for diversified  
execution environments

Seed Round Preview



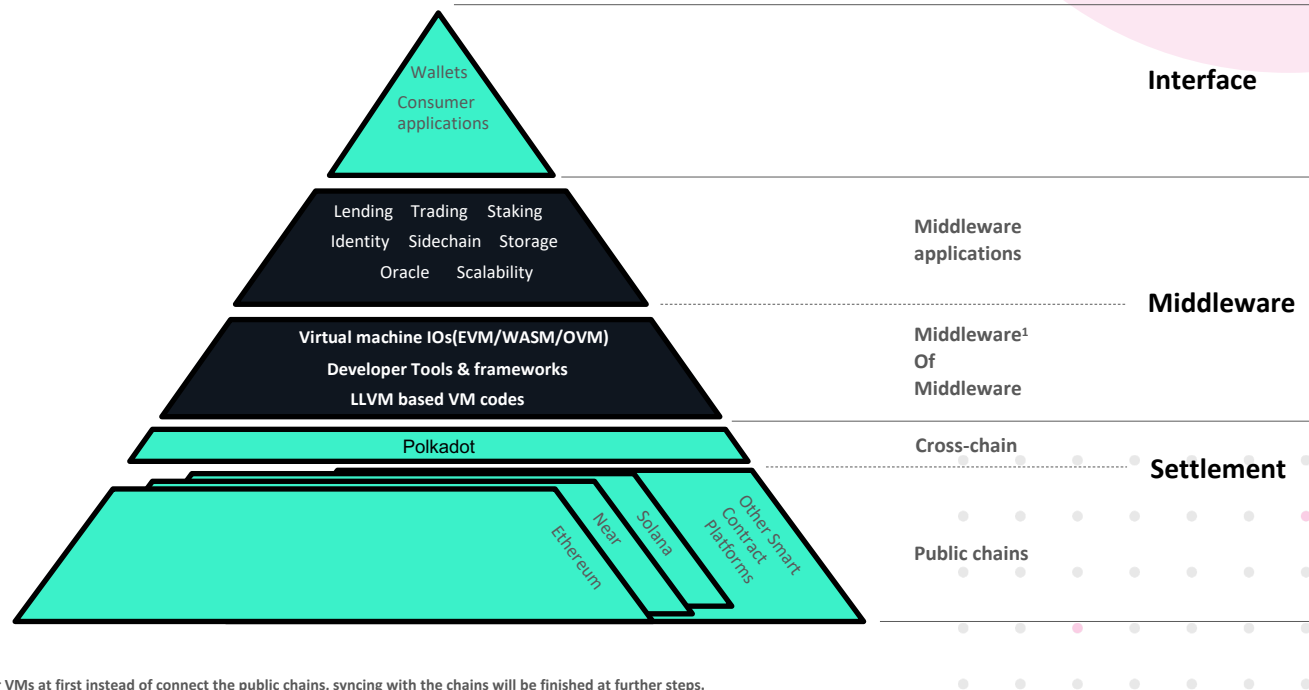
❖ The distributed network is split by different blockchains and virtual machines



DCG published a 3-layer model for distributed network, it's abstract/true and 2-dimensions. But the real mapping with 3-dimensions will lead to gaps with different settlements(public chains), and the gaps are huge

# Toochain is to build a middleware of the middleware to bridge the settlements

The 3-layer model for distributed network with Toochain



1.Toochain will support different public chains and their VMs at first instead of connect the public chains, syncing with the chains will be finished at further steps.

Toochain is building the middleware layer of the middleware, which will help to bridge the settlements and lead different application layers to be merged

# Toochain supports diversified execution environments and backed by unified MLIR/LLVM-based toolchain

- **A unified blockchain-oriented toolchain for diversified execution environments**
  - ▶ MLIR/LLVM-based compilation toolchain to support multiple smart contract languages:
    - Solidity, Ink!, domain-specific languages, create-your-own-languages...
  - ▶ Multiple virtual machine environments:
    - Solidity/EVM, BTC, TRON, ...
    - Supports new and future smart contract runtime platforms
    - Natively supports Layer-2 solutions: Optimistic VM, zk-Rollup
  - ▶ Smart bridging with other blockchains
    - Bridging with ETH/TRON/BTC, massive migration
    - Cross-language and cross-chain development made possible
- **Beneficial environment for DApps and developers**
  - ▶ DApp-friendly: economical gas consumption; fast speed; anti front-running
  - ▶ Developer-friendly: unique token circulation benefits our development community

## “Toolchain”

“In software, a toolchain is a set of programming tools that is used to perform a complex software development task or to create a software product, which is typically another computer program or a set of related programs”

-Wikipedia<sup>1</sup>

1. From the website “<https://en.wikipedia.org/wiki/Toolchain>”

# ❖ The unified toolchain for diversified execution environments...

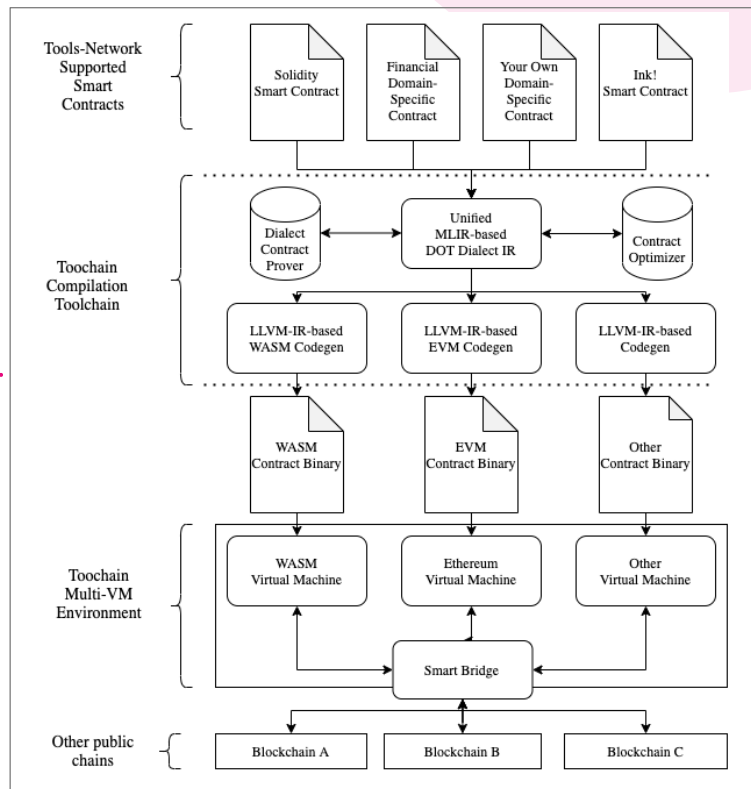
- **A platform for diversified contract execution environments**

- ▶ Supports multiple smart contracts languages, with a unified proving and optimizing infrastructure.

- **Open Virtual Machine platform**

- ▶ Capable of supporting multiple blockchain-compatible VMs (EVM, WASM VM, OVM, etc)
- ▶ Also supports existing toolchains (Solidity, Ink!, ...)
- ▶ Supports on-chain interconnection of multiple VMs for faster transactions/communications.

Structure of Toochain unified toolchain



## ...by utilizing Industrial-level MLIR/LLVM Compilation Toolchain for smart contracts

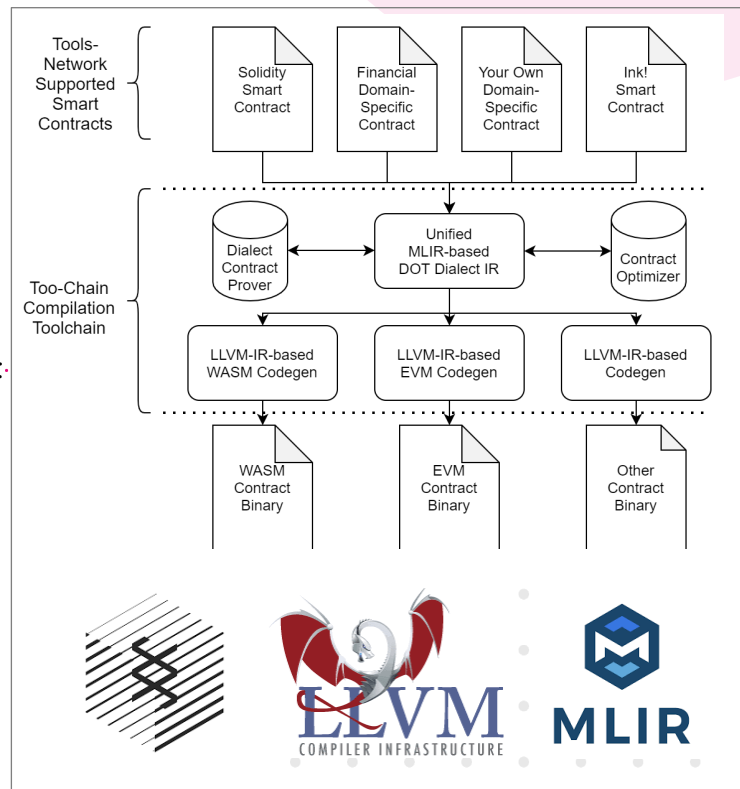
- **MLIR/LLVM is the state-of-the-art compiler infrastructure most widely used**

- ▶ Powering sophisticated systems such as: MacOS, Windows, Android, iOS, ...
- ▶ Highly matured: started 18 years ago and still going strong
- ▶ Heavily invested: Google, Apple, Qualcomm, Intel ...
- ▶ Highly Scalable: multiple source, multiple target

- **Open toolchain infrastructure to support multiple contract development/deployment environment**

- ▶ Build multiple smart contract languages under a unified contract dialect in MLIR
  - Reusing utilities such as provers and analyzers for all languages
  - Highly customizable language design for specific use cases
  - Create your own and future smart contracts
- ▶ LLVM-based binary code generation system
  - Reusing state-of-the-art compilation infrastructures
  - Optimizations for gas, resulting in cheaper transactions
  - Targets multiple runtime virtual machines
- ▶ Substrate-based runtimes make execution environments future-proof

### Structure of Toochain MLIR/LLVM Tech



## Toochain is DApp and developer friendly

**Toochain** uses Polkadot parachain technology to ensure the following features:

- **Anti front-running consensus to support healthy defi environments**

- ▶ DPoS-based, fast block-time, ordered transactions to reduce front-running
- ▶ Mempool encryption to avoid front-running

- **Flexible gas fee schedule**

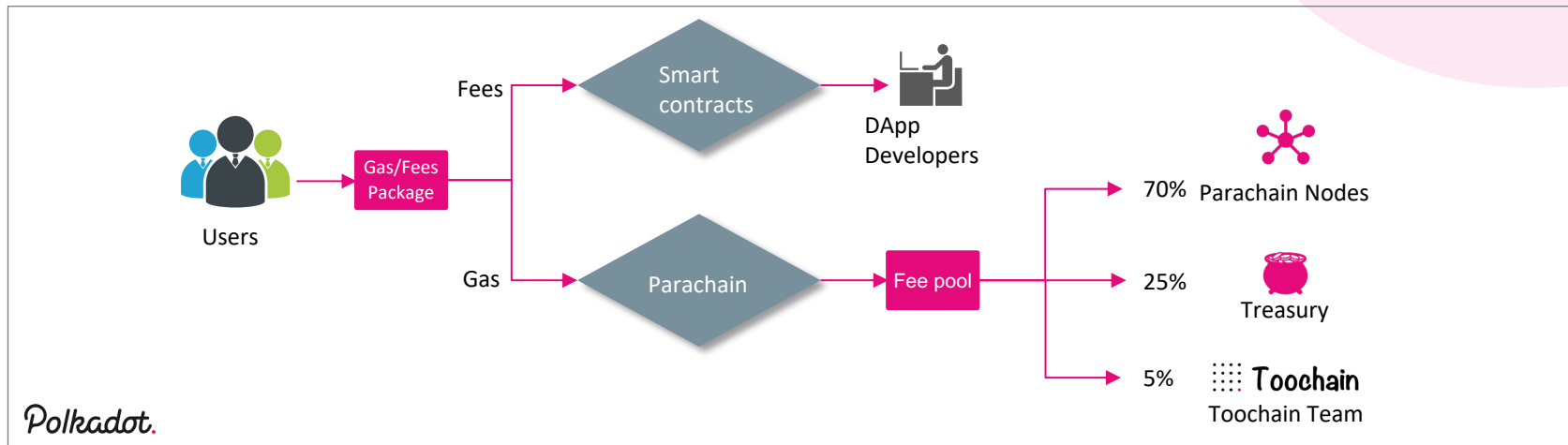
- ▶ A small fee could be levied on transaction's gas fees:
  - Some gas fees can go into treasury to support development community for continuous improvements of the toolchain – improved toolchain results in much efficient smart contract execution, hence less gas fees
  - Contract deployer can specify gas fee schedule

- **Optimized token economy for contract creators**

- ▶ Developers could gain rational income from the usages of their deployed smart contract

## Smart contract creators could charge for fees

### Flow chart of Toochain smart contract



Developers could gain income from the usages of their deployed smart contract

- Developers could set the Smart Contract Utilizing Rates for every deployed smart contract
- Users pay gas + fees for transactions. Cost is calculated and packaged
- All Fees are transferred to DApp Developer
- The Gas will go back to Toochain fee pools and will be distributed:
  - 70% tokens will be bonus for the parachain nodes
  - 25% token in fee pools will go to the treasury for future development
  - 5% token will send to the Toochain team as bonus



## Conclusion: Toochain is improving the blockchain developing environment

### Easy & fast for developing!

- Development using supported contract languages can use a unified, MLIR/LLVM-based SDK
- Mix-language development made possible

### More efficient and beneficial public chain!

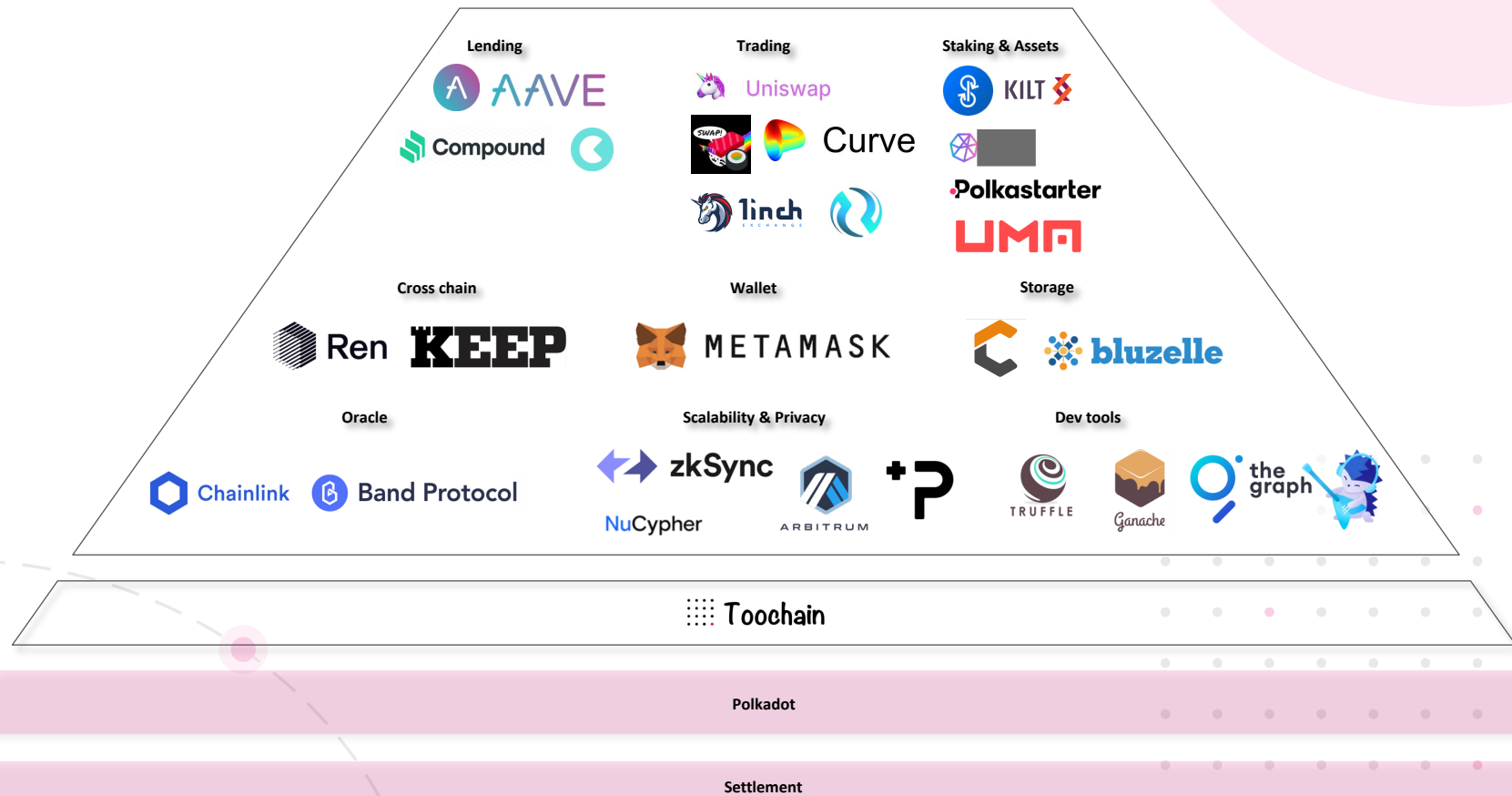
- Anti front-running consensus to support healthy DeFi environments
- Flexible gas fee schedule
- Rational income for contract creators

Toochain will support the whole middleware features among all middleware solutions

Middleware Features		Toochain	Moonbeam	Acala	PLASM	TrustBase
Toolchain	Solidity	✓	✓	✓	✓	
	Ink!	✓		✓	✓	
	Toochain	✓				
	New SCL <sup>1</sup>	✓				
VMs	EVM	✓	✓	✓	✓	
	WASM	✓		✓	✓	✓
Layer-2	Native Layer-2	✓				
	ZK-Sync	✓	✓	✓	✓	
	Optimistic VM	✓	✓	✓	✓	
Web3 RPC		✓	✓	✓	✓	✓
Massive migration		✓	✓	✓	✓	✓
Smart bridging	Assets bridging	✓	✓	✓	✓	✓
	Contract bridging	✓	✓	✓	✓	

1. "Smart Contract Language"

Toochain will be able to support almost all DApps from different public chain economies



# STOO Token Use Cases

## Work Token

- Fees – Users need to pay TOO tokens as fees to use the smart contracts on Toochain, Fee could be defined by smart contract owner.
- Gas – User need to pay TOO tokens as gas to use the Toochain.

## Governance

- Future decisions of the protocol, from upgrades to economic incentives, will be voted through the tokens

## PoS

- Tokens needed to be staked to be a node and validator of Toochain

## Staking

- ~25% annual staking rewards

# Timeline

Activity	2021				2022	
	Q1	Q2	Q3	Q4	Q1	Q2
MLIR/LLVM-based Toolchain						
Parachain Auction <sup>1</sup>						
Parachain Developing						
Kusama Toochain Testnet						
Security Audits						
Toochain Mainnet						
Toochain Smart Bridging						

1. The Auction for Kusama and Polkadot parachain maybe changed due to Polkadot community decision



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