Enterprise Ethereum Alliance
Technical Roadmap

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Final

Building on the shoulders of giants

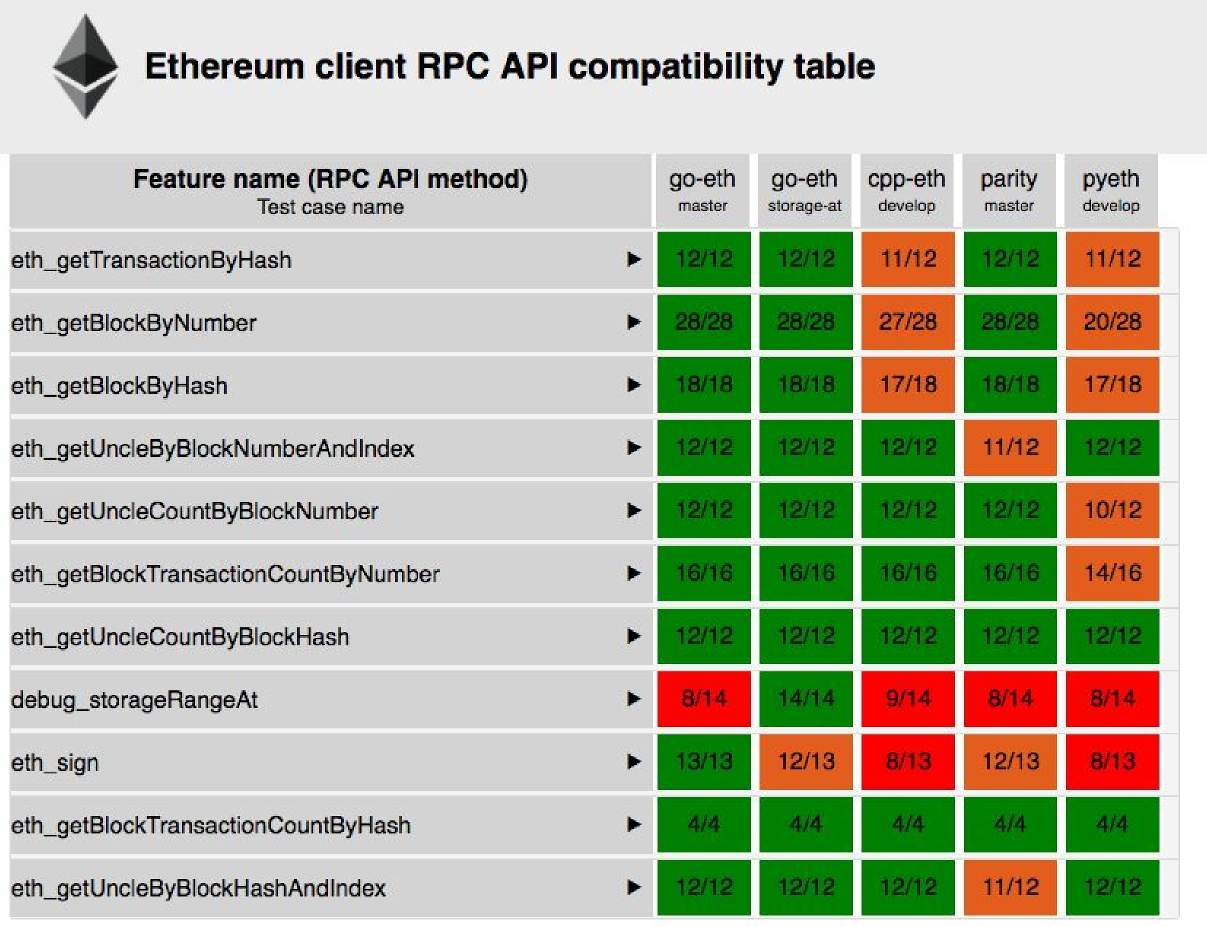
Doug.

What is our tech focus within the EEA?

- Superset of public-chain Ethereum
- Covers additional Enterprise needs
    - Confidentiality, scalability, permissioning
- Real-world compatibility is key is measure of success
- Not building a product - focus on specifications
- Looking to dogfood governance on the blockchain

Technical goals for 2017

- Create specification for EntEth 1.0
- Python reference client for that specification
- Benchmarking, compliance testing and tools
- Build roadmap to EntEth 2.0



Ethereum client RPC API compatibility table

Feature name (RPC API method) Test case name		go-eth master	go-eth storage-at	cpp-eth develop	parity master	pyeth develop
eth_getTransactionByHash	▶	12/12	12/12	11/12	12/12	11/12
eth_getBlockByNumber	▶	28/28	28/28	27/28	28/28	20/28
eth_getBlockByHash	▶	18/18	18/18	17/18	18/18	17/18
eth_getUncleByBlockNumberAndIndex	▶	12/12	12/12	12/12	11/12	12/12
eth_getUncleCountByBlockNumber	▶	12/12	12/12	12/12	12/12	10/12
eth_getBlockTransactionCountByNumber	▶	16/16	16/16	16/16	16/16	14/16
eth_getUncleCountByBlockHash	▶	12/12	12/12	12/12	12/12	12/12
debug_storageRangeAt	▶	8/14	14/14	9/14	8/14	8/14
eth_sign	▶	13/13	12/13	8/13	12/13	8/13
eth_getBlockTransactionCountByHash	▶	4/4	4/4	4/4	4/4	4/4
eth_getUncleByBlockHashAndIndex	▶	12/12	12/12	12/12	11/12	12/12

Example: http://cdetr.io/eth-compat-table/

EntEth 1.0 reference client

- Use pyethapp as reference client
- Use Quorum to drive modularity on confidentiality
- Use a BFT algorithm to drive modularity on consensus
- Compliance tests and benchmarking
- Reference client experiments used to drive specification

Confidentiality capabilities

- JPM identified privacy/confidentiality as their key blocker
- Quorum is the current de-facto (multi-chain) solution
- Legal and regulatory compliance are common needs
- Our immediate focus is on “Quorum functionality”
- There are many possible options in the longer term

Pluggable consensus

- Pluggable consensus is a characteristic of a codebase
- Not all codebases have the same architecture
- We might need to define a microservices architecture
- There are baby-steps on our way to this goal (ie. modes)
- It will be an iterative process to refine this decoupling
- Ultimate aim is to enable BFT, POW and POS approaches

Permissioning model

- Build a framework for application, data, network and administrative permissions
- Restrict enterprise chains from public/open access
- Likely authentication / authorization and role based security based, inline with existing Enterprise approaches

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Performance Evaluation

- Increase robustness and performance of Ethereum protocols
- Gain understanding of components and characteristics based on properties like client, contract execution, network, and scalability
- Replay transactional data from existing databases
- Leverage pre-existing real-world (big) data of public Ethereum network

Long-term goals

- The Holy Grail is a set of modules which can be dynamically composed to meet all use-cases, public and private
- Possible convergence of public and Enterprise roadmaps
- There are numerous potential avenues for exploration: data feeds, data management, instrumentation (i.e., EVM)

Next steps

- Continue our conversations with EEA technical community
- Blockchain governance and EIP process for Enterprise proposals
- We would love to receive feedback
  - Planning on having open communication channels such as mailing lists (very soon)

Appendix

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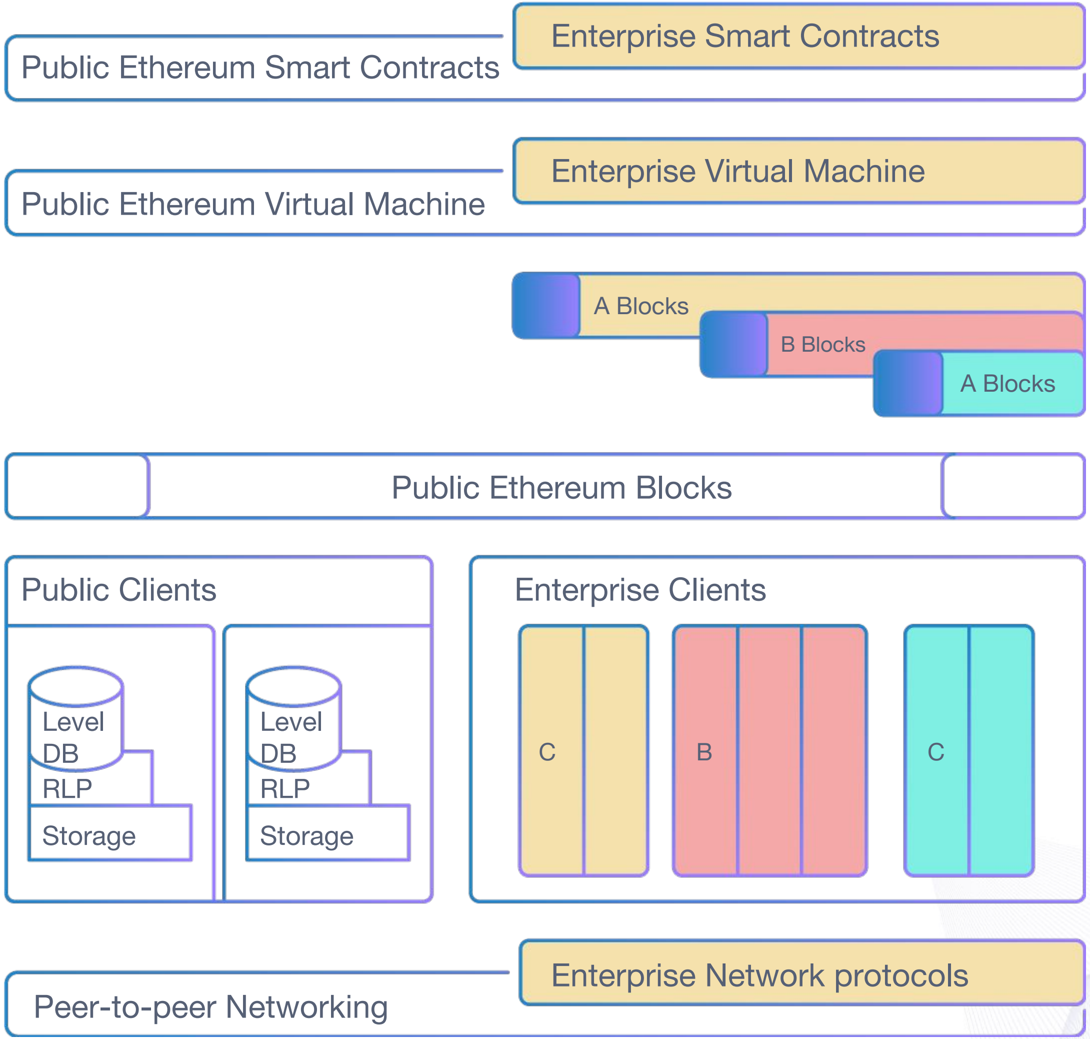
Enterprise Ethereum Protocol Stack


Enterprise Smart Contracts
Public Ethereum Smart Contracts
Enterprise Virtual Machine
Public Ethereum Virtual Machine
A Blocks
B Blocks
A Blocks
Public Ethereum Blocks
Public Clients
Level DB
RLP
Storage
Level DB
RLP
Storage
Enterprise Clients
C
B
C
Enterprise Network protocols
Peer-to-peer Networking

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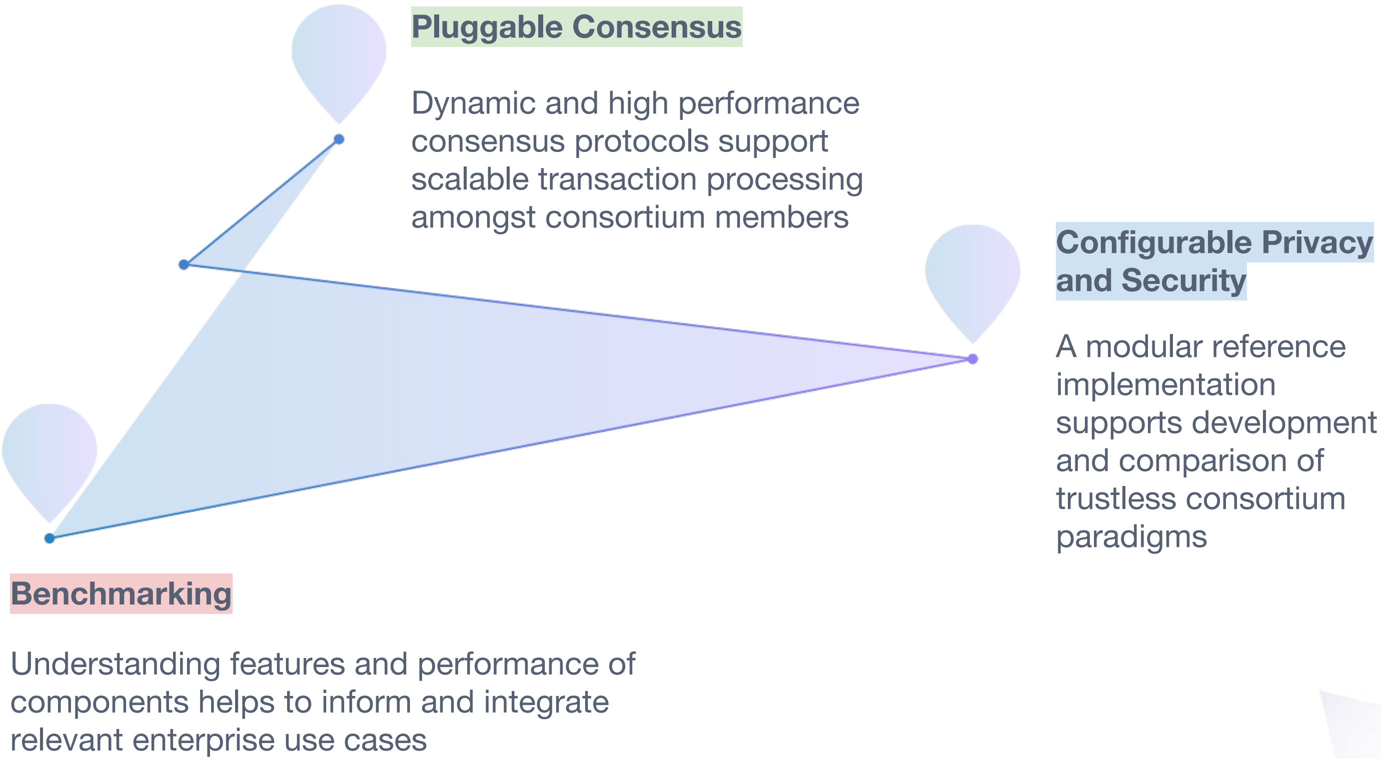

Pluggable Consensus

Dynamic and high performance consensus protocols support scalable transaction processing amongst consortium members

Configurable Privacy and Security

A modular reference implementation supports development and comparison of trustless consortium paradigms

Benchmarking

Understanding features and performance of components helps to inform and integrate relevant enterprise use cases

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