Building on the shoulders of giants
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

<table>
<thead>
<tr>
<th>Feature name (RPC API method)</th>
<th>Test case name</th>
<th>go-eth master</th>
<th>go-eth storage-at</th>
<th>cpp-eth develop</th>
<th>parity master</th>
<th>pyeth develop</th>
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<tbody>
<tr>
<td>eth_getTransactionByHash</td>
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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
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)
Enterprise Ethereum Protocol Stack

Public Ethereum Smart Contracts

Public Ethereum Virtual Machine

Enterprise Smart Contracts

Enterprise Virtual Machine

A Blocks

B Blocks

A Blocks

Public Ethereum Blocks

Public Clients

Enterprise Clients

Peer-to-peer Networking

Enterprise Network protocols

Level DB

RLP

Storage

Level DB

RLP

Storage

C

B

C
Benchmarking

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

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.