Developing an Ethereum blockchain application

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Things to get out of the way
Things to get out of the way

Who the frack am I?
Things to get out of the way

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What the frack is Ethereum?
Things to get out of the way

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What the frack is Ethereum?

I cannot explain everything...
1. Research Question

Can Ethereum be directly used to rapidly deploy meaningful and sufficiently performing trusted applications with added value over traditional approaches?

2. Installing Ethereum

OS X: OK!
Ubuntu: OK!
Debian: Are you kidding me?
1. Research Question

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0. Motivation

➔ Hype: ‘The Internet how it was supposed to be’.
➔ More hype: $18.5M funding
➔ Contracts: The ‘safeguards’ of liberty.

2. Installing Ethereum

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OS X: OK!
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3. Understanding Ethereum
   - WHERE IS THE DOCUMENTATION????
   - Ether = the internal currency
   - Blockchain = our motivating factor
   - Smart contracts, smart ‘democracy’

4. Understanding Ethereum
   - Contract ≈ OO class
   - Instance ≈ OO object
   - Transaction = interaction with anything
   - Gas = nothing is for free

5. Understanding Ethereum
   - Ethereum ≠ Bitcoin
   - Ethash (Dagger-Hashimoto)
   - 12 sec. block time
   - Genesis block???
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6. Setting up a test network
   ➔ No ‘real’ ether to spend
   ➔ Using ‘counterfeit’ ether
   ➔ Nodes can’t peer :
   ➔ ‘Use a large network ID’
   ➔ ...not too large

7. Setting up a test network
   ➔ ‘Useless peer’...!!!
   ➔ Peers largely out of sync
   ➔ Nodes mining frantically
   ➔ Raise the initial mining difficulty

8. Setting up a test network
   ➔ Turn off peer discovery
   ➔ Add peers statically
   ➔ Network stabilizes
   ➔ Send sample transactions
   ➔ SUCCESS!!!
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9. Setting up a registrar
   ➔ At least 3 different guides
   ➔ This makes no sense
   ➔ ‘With a little help from my friends’
   ➔ Works, no idea why...

10. A simple contract
    ➔ Broadcast some messages
    ➔ Only the recipient can read their own messages
    ➔ (Not really...)

11. An advanced contract
    ➔ A court of law for civil cases
    ➔ Are you kidding?
    ➔ Plaintiff, defendant, bench, jury, treasurer.
    ➔ ‘Justice’ token
    ➔ Adversary system (debate, vote)
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12. Developing the contract
➔ ‘Solidity’
➔ Variables, mappings
➔ Constant Functions
➔ Transactional Functions
➔ Events
➔ Modifiers

13. Writing setup scripts
➔ Instantiate a registrar
➔ Register entities
➔ Distribute ether
➔ Compile and instantiate case contract
➔ Watchbots.js to consume events

14. Executing the contract
➔ Assume roles for each participating node
➔ Run the setup scripts
➔ Interact with the contract and see events flowing in
➔ Mostly works as designed
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- Dev < Ops
- Setting up: 2.5 Weeks
- Developing: 2.5 Days
- Very intuitive language

16. Drawing more conclusions

- Debugging is not as agile as we’re used to
- Everything needs to be mined
- Everything costs gas
- Live network: gas = money

17. Drawing further conclusions

- Great leverage for ‘trustless’ applications
- Very powerful concepts
- Huge lack of documentation
- Low project maturity
- Great potential
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  ➔ Whisper
  ➔ Swarm
  ➔ Mist
  ➔ Ethereum itself

19. Our future
  ➔ Fully develop the court contract
  ➔ Proper benchmarking (performance, cost)
  ➔ Evaluate security
  ➔ Use contracts to research open problems
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K thx
Ask me stuff!