Welcome Neoxplorers!

"Genesis Block 0" Meetup – March 14, 2018

https://www.meetup.com/NEO-Blockchain-Toronto/

neotoronto@outlook.com

NEO
smart economy

What You've Asking to See/Hear/Learn About

- How to create smart contract on Neo, what will be the oracle (is there a similar setup with Neo like it is with etherium?)
- Sidechains, Trinity, Interledger
- I would like to know more about future plans
- NEO future
- jobs
- Dapp development on NEO
- The future of NEO and how quickly dapps will begin to appear on the platform.
- How is NEO different, what problem does it solve and how. Thanks in advance
- how to build smart contracts
- Getting into blockchain development
- How does NEO compare to Ethereum, ICON and Qtum with respect to both technical goals and end-vision. More generally, where does NEO see itself fitting in the ecosystem among other platform blockchains?
- How what Dapps are being developed on the NEO platform from Local area and how they can be supported.

- Road Map regarding the future
- Intro to neo
- NEO ICOs
- Decentralization and large-scale adoption.
- Python smart contract development
- How NEO will be implemented in the future. What sort of benefits can they bring economically. Why go with NEO versus other blockchain solutions?
- Information on NEO based ICOs, also info on trinity and NEX exchange! Thanks!
- resources, local projects or teams
- Elastos
- Let's start at the beginning.
- Am a .NET guy too. Getting started on development
- Technical aspects of programming for Neo, coding, deployment
- Understanding of NEO Blockchain
- Neo origins
- NEO Smart Contract and ICOs
- Technical details
- NEO Development

NEO Themes You've Asked About – Thank you!

- Distributed Application (dApp) Development
  - How to start / Start at the beginning / .NET / Python
- Technical Details / Architecture
- Future of NEO
- NEO Adoption
- Jobs
- How is NEO different?
  - How is it better than the other blockchains
  - How does it compare with Ethereum, etc. …
  - Co-existence with the other blockchains
  - ETH, Sidechains, Trinity, Interledger, ICON , Qtum, Elastos
- NEO ICOs

Agenda

1. Introductions
2. What is NEO?
3. NEO Whitepaper / NEO Smart Economy
4. Aside: Why do things have value? Why do they appreciate?
5. Why NEO?
6. NEO Events
7. NEO Resources

Who is Michael Herman?

- Past: Decades of experience on the Microsoft platform, Alberta cattle rancher, scuba diver and downhill skier

- **Now: Work 16 hours a day on the NEO Blockchain**

- **Independent Developer**

  - **NEO Blockchain C# Center of Excellence**

  - **NEO City of Zion (CoZ)**

- Michael Herman is a independent developer and writer who contributes to several NEO Blockchain projects including:

  - NEO developer tool suite (neo-debugger and neo-gui-developer projects)

  - mwherman2000/neo-persistableclasses project – home of the NEO Persistable Class Framework (NPC) for efficient object-oriented smart contract development using C#.NEO

  - mwherman2000/dotnetquickstart project – home of the NEO Blockchain Quick Start Guide for .NET Developers.

- Michael is also the founder of the **NEO Blockchain C# Center of Excellence** as well as the first Canadian NEO Blockchain Meetup group (NEO Blockchain Toronto). He has helped bootstrap several additional Meetups worldwide including NEO Blockchain Vancouver, NEO Blockchain Cancun, and NEO Blockchain Turkey.

Introductions

- Lead Neoxplorer: Michael Herman

  E: mailto:neotoronto@outlook.com
  M: https://www.meetup.com/NEO-Blockchain-Toronto
  G: https://github.com/mwherman2000/neo-csharpcoe/tree/master/events
  F: https://www.facebook.com/neotoronto/
  T: https://www.twitter.com/neotoronto

- Who are you?

  - Crytopinvestor/trader?

  - Software Developer/Achitect?

  - Legal profession?

  - Financial services (conventional)?

  - Miner?

What is NEO Blockchain Toronto?

- NEO Blockchain Toronto (https://www.meetup.com/NEO-Blockchain-Toronto/) is a **non-profit, community-based Meetup group** for blockchain developers and architects interested in designing and creating **Distributed Ledger Technology (DLT) (aka blockchain) solutions using the NEO Blockchain platform.**

- We call ourselves *Neoxplorers*

- Meetup second Wednesday evening of each month
  - **April 11**, May 9, June 13, …

- This meetup is a group that it is independent of but supported by the NEO Project (https://github.com/neo-project).

- More importantly, NEO Blockchain Toronto is *what **we** want to make it!*

Our Values as *Neoxplorers*

We <u>operate</u> like the NEO Blockchain

- Decentralized
- Community based
- Consensus driven
- Creators of value
- Store of value (knowledge)
- Transfer of value (training)
- Multi-disciplinary
- Multi-application
- Multi-technology

We <u>behave</u> like the NEO Blockchain

- Robust
- Reliable
- Transparent
- Smart
- Open
- Non-discriminatory
- Participatory
- Diversity
- Committed

What is NEO?

- PROJECT: NEO (https://neo.org/) is a non-profit, community-based blockchain project that utilizes blockchain technology and digital identity to digitize assets, to automate the management of digital assets using smart contracts, and to realize a "smart economy" with a distributed network.

- DUAL CRYPTOCURRENCY: $NEO and $GAS

- SOFTWARE PLATFORM: Programmable Smart Contract blockchain platform
  - Multiple languages: C# (reference implementation), Python, Java, Golang, JavaScript

- NEO SMART ECONOMY

- GLOBAL COMMUNITY
  - Discord: https://discord.gg/gqCYeup / https://discord.gg/4TQujHj
  - NEO C# Developers Center of Excellence (neo-csharpcoe) https://github.com/mwherman2000/neo-csharpcoe/blob/master/README.r
  - City of Zion "Home of the Open-source Global NEO Developer Community" https://cityofzion.io/

3/14/2018

Dual Cryptocurrency Model: NEO and NeoGas

- In the NEO Smart Economy, there is a separation of concerns:
  - NEO   represents Voting Power
  - NeoGas   represents Ability to Fund Work (Systems Fees)
- NEO (NEO)
  - Should hold and retain NEO to maximize your voting power
  - Receive distributions of GAS
- NeoGas (GAS)
  - Used to fund the deployment of smart contracts (applications) on the NEO Blockchain
  - Used to fund transactions executed on the NEO Blockchain
    - Transfers of NEO/tokens from sender to receiver
    - Invoke operations in smart contract that update the state of the NEO Blockchain
    - Operations that just read state (data) back from the NEO Blockchain are essentially free
  - NeoGas is sometimes referred to as a "Utility Token"
  - System Fees are recycled and re-distributed in ratio/proportion to the number of NEO you hold
  - Transaction Fees are distributed among the consensus nodes. Strong incentive to keep fees close to zero

NEO Whitepaper

"NEO is the use of **blockchain technology** and **digital identity** to **digitize assets**, the **use of smart contracts for digital assets to be self-managed**, to achieve [a] **"smart economy" with a distributed network.**"

What is the NEO Smart Economy?

NEO Smart Economy

=

Digital Assets

+

Digital Identity

+

Smart Contracts

Future world where the boundary between real assets in the physical world and digital assets in the digital world has been removed.

NEO Decentralized Applications (Use Cases)

- Smart fund

- AI-assisted legal smart contracts

- Social networking

- Automated tokens liquidity providers

- Decentralized exchange

- Secure communications protocol

- Data exchange market

- Intellectual property trading market

- Prediction market

- Advertising market

- Hashpower market

- NeoGas market

NEO Management Model: Economic Model

- Dual Cryptocurrency Model: NEO and NeoGas
- NEO
  - NEO Whitepaper: "right to manage the network"
    - "Bookkeeping, network parameter change, and so on"
  - 100 million total tokens
  - Not divisible: minimum unit = 1 NEO
- NeoGas (GAS)
  - NEO Whitepaper: "fuel token"
    - "Network charges for the operation and storage of tokens and smart contracts"
    - "Creating economic incentives for bookkeepers and preventing abuse of resources"
  - Maximum of 100 million tokens
  - Divisible: minimum unit = 0.000,000,01 GAS

NEO Management Model: Economic Model

- Genesis Block 0
  - "100 million NEOs was generated"
  - "Zero GAS was generated"
- "100 million GAS, corresponding to the 100 million NEO, will be generated through a decay algorithm in about 22 years time to addresses holding NEO"
- "If NOE is transferred to a new address, the subsequent GAS generated will be credited to the new address"

NEO Management Model: Distribution Mechanism

- NEO

- First 50 million NEO

    - "50 million NEO has been distributed proportionately to supporters of NEO during the crowdfunding"

- Second 50 million NEO

    - "10 million tokens (10% of total) – motivate NEO developers and NEO Council members"

    - "10 million tokens (10% of total) – motivate developers in the NEO ecosystem"

    - "15 million tokens (15% of total) – cross-investment in other blockchain projects (owned by the NEO Council and only used for NEO projects)"

    - "15 million tokens (15% of total) – retained as contingency"

    - "Annual use of NEO in principle should not exceed 15 million tokens"

NEO Management Model: Distribution Mechanism

- GAS
- "GAS is generated for each new block. The initial amount of GAS is zero."
- "With the increasing rate of new block generation, the total limit of 100 million GAS will be achieved in about 22 years."
- "Interval between blocks is 15-20 seconds. 2 million blocks are generated in about one year."
- "Initial GAS generation will be 8 GAS per block."
- "Annual reduction of 1 GAS per block, per year, to coincide with the passing of every 2 millions blocks."
- "Reduction will continue down to just 1 GAS per block and will be held at that rate for around 22 years."
- "After the 44 millionth block, the total GAS generated will have reached 100 million and from this point on there will be no further [GAS] generation from new blocks."
- "Release curve: 16% of total GAS will be created in the first year, 52% of the GAS will be created in the first four years, and 80% will be created in the first 12 years."
- "Gas will be distributed proportionally in accordance with the NEO holding ratio, recorded in the corresponding addresses."

NEO Management Model: Governance Mechanism

- Chain Governance
  - "NEO Token Holders are the network owners and managers, managing the network through voting in the network."
  - "Using GAS generated from NEO to utilize the functions of the network."
- Off-Chain Governance
  - "NEO Council consists of the founding members of the NEO project."
  - "Under which the management committee, technical committee and the secretariat, respectively, are responsible for the strategic decision-making, technical decision-making, and specific implementation."
  - "NEO Council is responsible to the NEO Community for the promotion and development of the NEO ecosystem as its primary objective."

NEO Technology/Implementation: Consensus Mechanism
Delegated Byzantine Fault Tolerance (dBFT)

▶ Delegated Byzantine Fault Tolerance (dBFT) consensus mechanism is used by NEO

▶ "Byzantine fault-tolerant consensus mechanism that enables large-scale participation in consensus through proxy voting."

▶ "The holder of the NEO token can, by voting, pick the bookkeeper it supports."

▶ "The selected group of bookkeepers, through BFT algorithm, reach a consensus and generate new blocks."

▶ "Voting in the NEO network continues in real time, rather than in accordance with a fixed term."

NEO Technology/Implementation: Consensus Mechanism
Delegated Byzantine Fault Tolerance (dBFT)

- "The dBFT provides fault tolerance of $f = \lfloor (n-1) / 3 \rfloor$ for a consensus system consisting of n consensus nodes."

- "This fault tolerance also includes both security and availability, resistant to general and Byzantine failures, and is suitable for any network environment."

- "dBFT has good finality, meaning that once confirmations are final, the block can not be bifurcated, and the transaction will not be revoked or rolled back."

NEO Technology/Implementation: Consensus Mechanism
Delegated Byzantine Fault Tolerance (dBFT)

- "In the NEO dBFT consensus mechanism, taking about 15 to 20 seconds to generate a block, the transaction throughput is measured up to about 1,000TPS, which is excellent performance among the public chains."

- "Through appropriate optimization, there is potential to reach 10,000TPS, allowing it to support large-scale commercial applications."

- "The dBFT combines digital identity technology, meaning the bookkeepers can be a real name of the individual or institution."

- "Thus, it is possible to freeze, revoke, inherit, retrieve, and ownership transfer due to judicial decisions on them."

- "This facilitates the registration of compliant financial assets in the NEO network. The NEO network plans to support such operations when necessary."

# Delegated Byzantine Fault Tolerance (dBFT)
NEO Consensus Mechanism
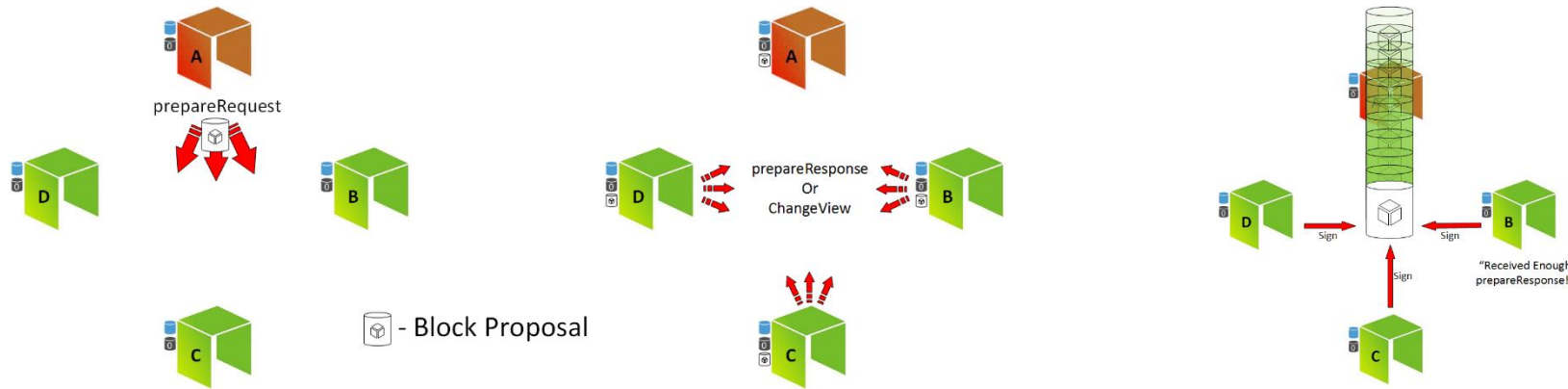
- NEO: There is no competition to create the next block (e.g. no miners, no PoW)
- NEO: There is no betting or staking to choose the next block (e.g. no PoS)
- NEO: Consensus nodes are voted in as representatives to choose the next block
- NEO: No reward for your own node to be selected

Problems with Proof of Work and Proof of Stake
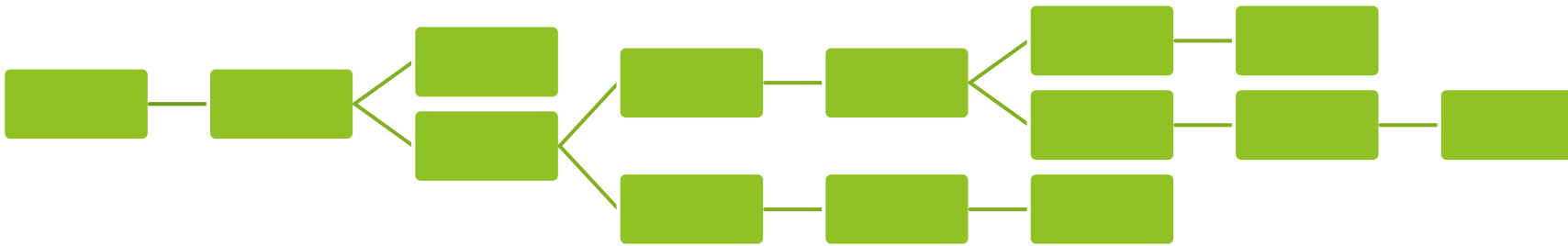
1. Proof of Work (PoW)
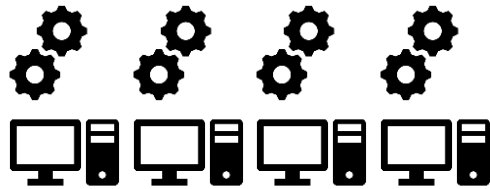
2. Proof of Stake (PoS)
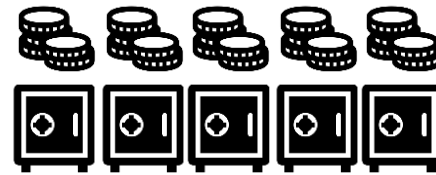
PoW and PoS compared to dBFT

- Consensus algorithm: PoW and PoS

- Consensus algorithm: dBFT

- One and only one branch

"I want to be become a NEO Consensus Node"

- Very little economic reward/incentive
  - Transactions fees need to be kept at zero or close to zero
  - Else you will run the risk of your node getting voted out
- High initial cost
  - 1000 GAS (USD$30,000 – March 2018)
- Need to a high balance in your NEO address
  - Else you further run the risk of your node being voted out
- Primary motivation: Maintaining the integrity of the NEO network

The Problems with PoW* and PoS*

Block creators are incentivized by economic rewards

If a transaction does not include a transaction fee, then the block creators have no interest in resolving it.

This is just how PoW and PoS has to be structured. If there is no economic reward in creating blocks, then there will be less nodes participating in the network, directly influencing network security.
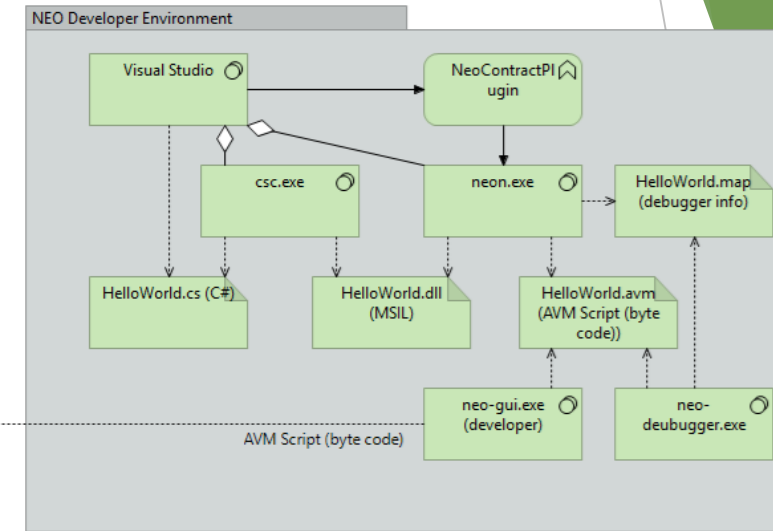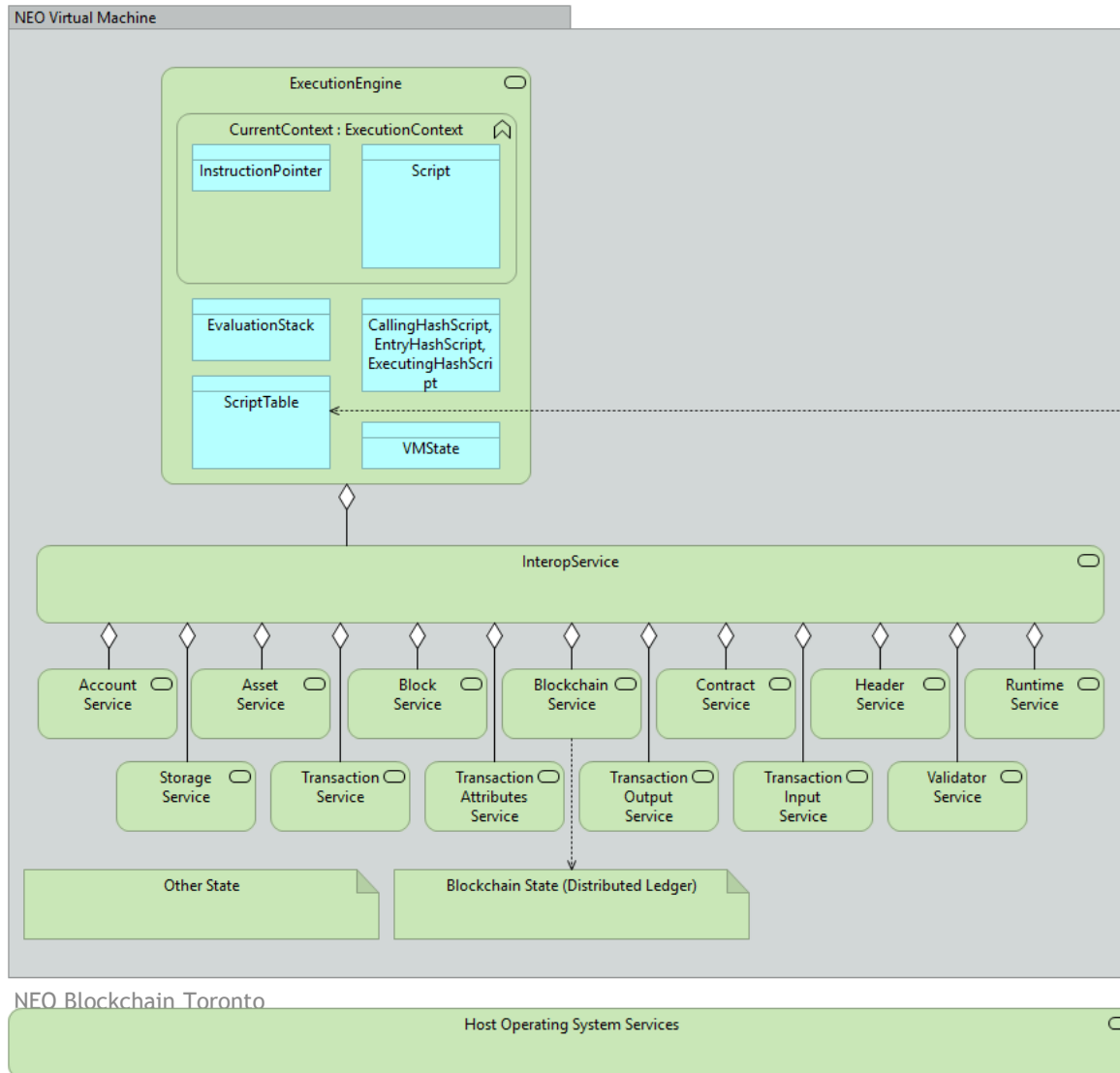
This structure is however in direct conflict with the interest of decentralized applications.

Many large scale applications need the transactions to be free of charge for the end user, while still ensuring stable service (transaction time). This will always be a conflict of interest for PoW and PoS systems.
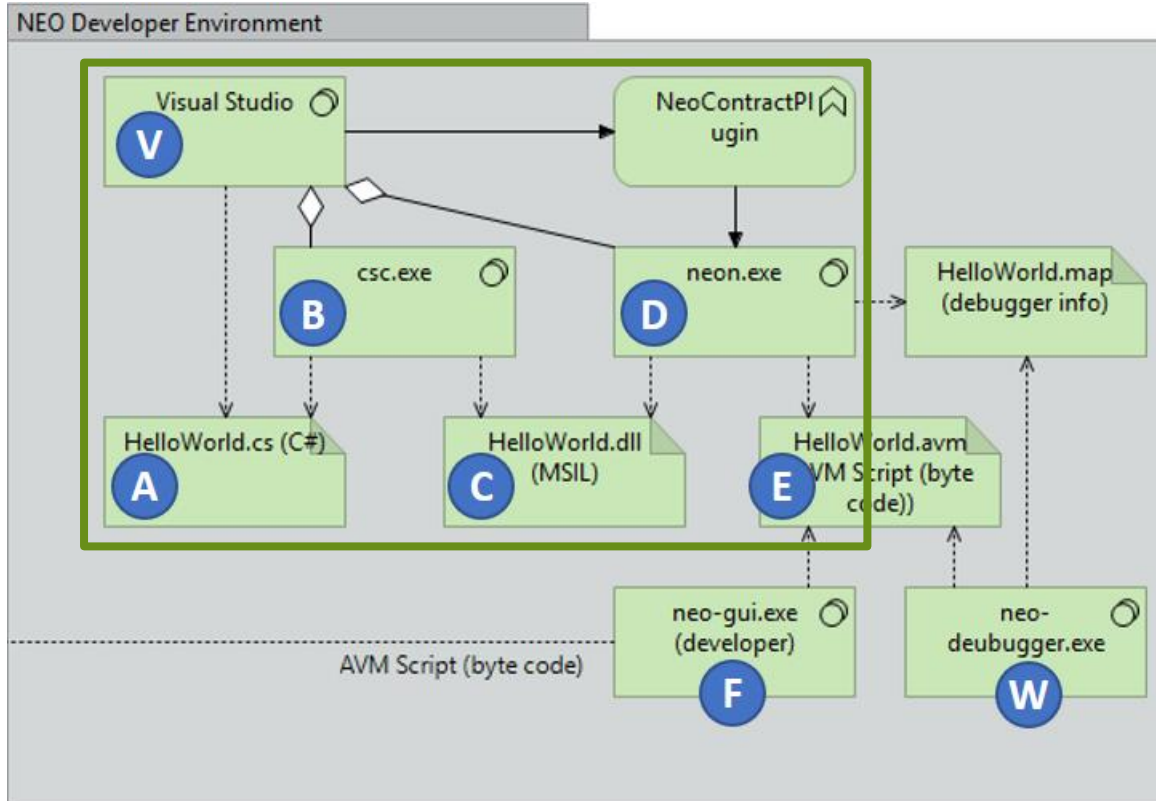
*PoW - Proof of Work
*PoS - Proof of Stake

NEO Technology/Implementation: NeoContract

References
1. https://github.com/neo-project/neo/blob/bf2c10598e78fa65ad3c06d181b72f33f5d7f012/neo/SmartContract/ApplicationEngine.cs#L433
2. Visual Studio Object Browser: NEO Assemblies
3. neo-debugger project

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NEO Technology/Implementation: NeoContract

NEO Technology/Implementation: NeoContract
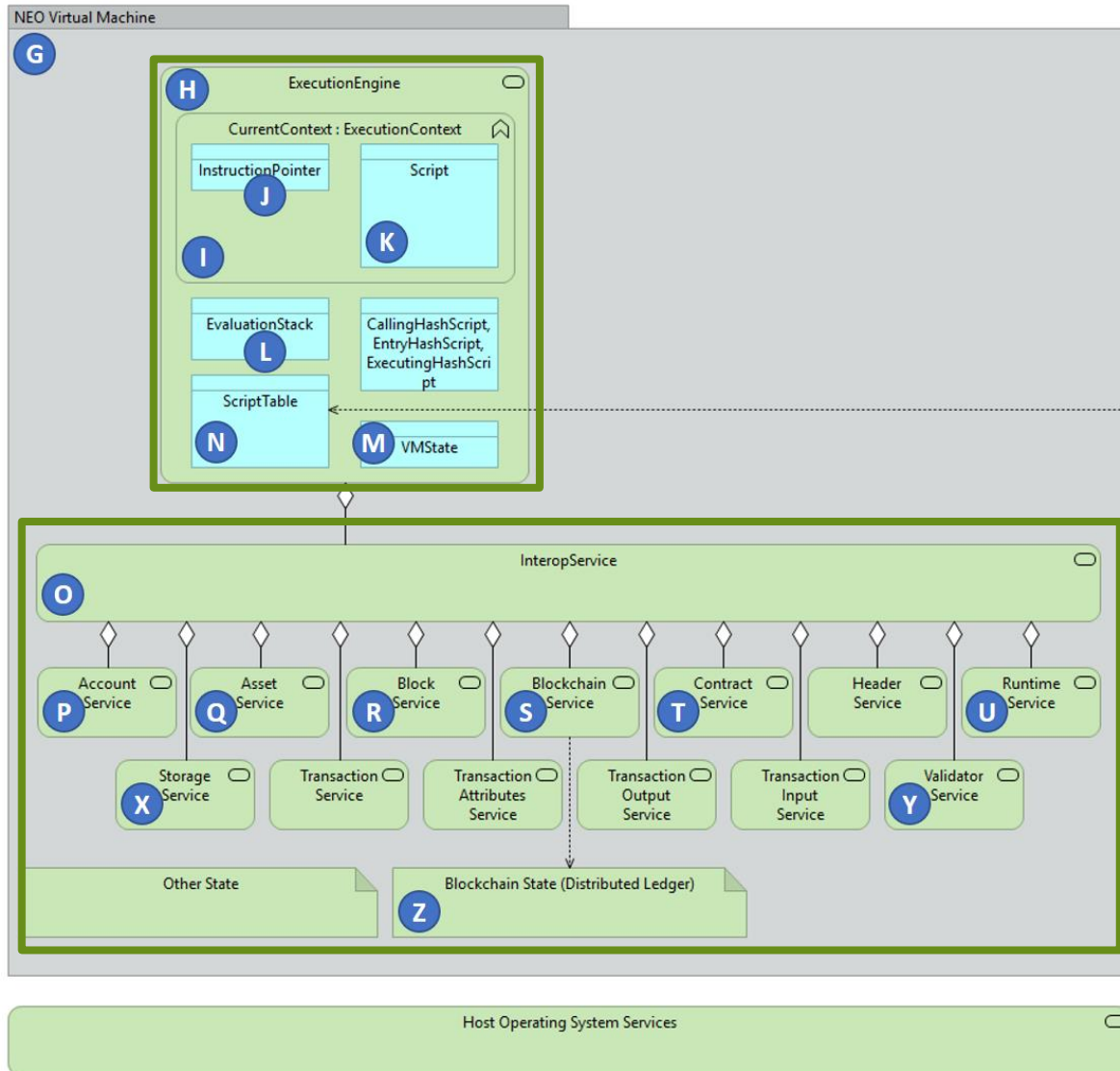
Aside: Why do things have value? Why do they appreciate?
Michael's Theorem

- **It's all about Scarcity**
  - Real or perceived
  - Simpler terms: Supply and Demand (but I prefer the term scarcity)
- The difficulty or cost of acquiring new or additional assets
  - Money, diamonds, gold, …, cryptocurrencies
- The difficulty or cost of product or manufacturing new assets
  - Bitcoin, Ethereum (ETH)
  - Proof of Stake (PoS) concensus/verification processes
  - Millions of miners competing: HUGELY wasteful, expensive, slow
- Could be through the regulation of price and/or supply – illusion of scarcity
- "Mining is a **process of validating a transaction or block** in a network by the **process of complex algorithms to prove and validate the correctness of the transaction** and thereby add the new block to the chain." [https://medium.com/@karthik.seshu/cryptocurrency-proof-of-work-vs-proof-of-stake-e1eee1420b10]

What happens when things become easier to acquire?
Michael's Theorem

▶ What happens when things become easier to make/manufacture?

▶ What happens to the price of ETH when Ethereum moves to Proof of Work (PoW)?

  ▶ Millions of competing miners aren't needed for Ethereum anymore

  ▶ Maybe they move back into Bitcoin mining – perhaps driving down the cost of a Bitcoin?

▶ NEO Blockchain uses Delegated Byzantine Fault Tolerance (dBFT)

  ▶ Currently runs 8 nodes WW to support about 1000TPS throughput

  ▶ By 2020, NEO estimates this will need to grove to 12 nodes to achieve 100,000TPS

  ▶ Very small number of nodes

How Transaction Fees are Discouraged in the NEO Smart Economy

1 Each NEO token equals one vote for consensus nodes.

2 Consensus nodes may choose to refuse throughput upgrades because they have economic interest in transaction fees.

3 NEO holders only get system fees distributed to them, not transaction fees. More network usage equals more system fees, so NEO holders will work for increasing network throughput.

4 Because of point 3, consensus nodes that refuse throughput upgrades will not be re-voted as consensus nodes and other consensus nodes will be voted in.

5 Points 1-4 ensure that transaction fees are zero or near zero. Enterprises that want a decentralized application can safely develop on the NEO Blockchain without being worrying that their users may have difficulties in attaining the tokens they need.

NEO Distributed App (dApp) Development

Smart Contracts: "Have it your Way"

- Develop, debug and test Smart Contracts in the language you prefer
  - C# (reference implementation)
  - Python,
  - Java
  - Golang
  - JavaScript
- Develop, debug and test Client Apps using the frameworks you prefer
  - ASP.NET, WinForms, WPF, Console Applications, Window Services, …
  - Node.JS
  - Python
  - Java
  - Golang

Smart Contracts: "Have it your way"

```csharp
using Neo.SmartContract.Framework;
using Neo.SmartContract.Framework.Services.Neo;

namespace Neo.SmartContract
{
    public class Lock : VerificationCode
    {
        public static bool Verify(byte[] signature)
        {
            Header header = Blockchain.GetHeader(Blockchain.GetHeight());
            if (header.Timestamp < 1499328600) // 2017-6-6 18:10
                return false;
            // Paste the public k
            return VerifySignatur
4, 91, 78, 93, 139, 126, 48, 58,
2, 122, 213, 170 }, signature);
        }
    }
}
```

```java
import org.neo.smartcontract.framework.SmartContract;

public class ContractAuthentication extends SmartContract {

    static boolean Main(byte[] signature)
    {
        Header header = Blockchain.getHeader(Blockchain.height());
        if (header.timestamp() < 1506933900)
            return false;
        // Paste the public key byte array here
        byte[]  b = { 2, -99, 6, 102, 4, -41, 48, -96, -116, 23, 9, 72, -89, -104, -107, 2, -8, -70, -2,
                96, 60, -21, 105, 105, -93, 103, -80, -113, 17, -61, 7, 20, -85 };
        return verifySignature(b, signature);
    }

}
```
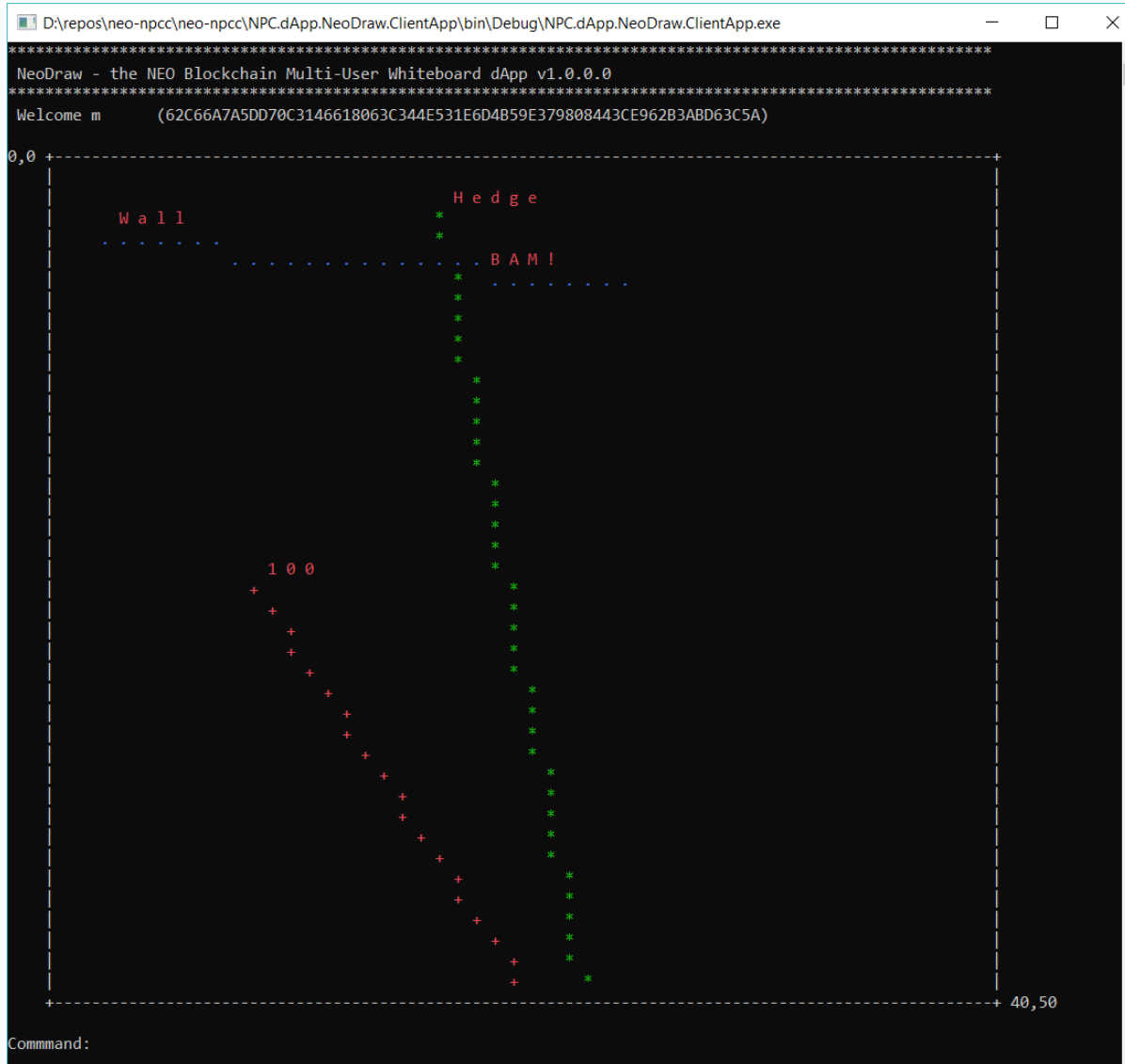
NeoDraw - NEO Multi-Person Shared Whiteboard dApp
NEO Blockchain as an Enterprise Application Platform

- ▶ NeoDraw is advanced proof-of-concept distributed application (dApp) for the NEO Persistable Classes (NPC) Entity-based dApp (e-dApp) Platform running on the NEO Blockchain.

- ▶ Uses 3 entities
  - ▶ UserCredentials
    - ▶ User name and User Password
  - ▶ UserPoint
    - ▶ Array of (X,Y) coordinates/user
  - ▶ NeoCounter
    - ▶ Tracks number points/user

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NeoDraw - NEO Multi-Person Shared Whiteboard dApp
NEO Blockchain as an Enterprise Application Platform

```
UserCredentials.cs  ⊟ ✕    UserPoint.cs  ⊟ ✕    NeoCounter.cs  ⊟ ✕

C# NPC.dApps.NeoDraw      C# NPC.dApps.NeoDra    C# NPC.dApps.NeoDraw                    ▼    C# NPC.dApps.NeoDraw.NeoCounter

  1   ⊟namespace            1      using         1     using System.Numerics;
  2    {                    2                     2
  3        publi            3    ⊟names           3    ⊟namespace NPC.dApps.NeoDraw
  4        publi            4    {                4    {
  5        publi            5  ⊟                  5  ⊟     public partial class NeoCounter:       NPCLevel0Basic,
  6        publi            6                      6                                                NPCLevel1Managed,
  7        publi            7                      7                                                NPCLevel2Persistable,
  8        publi            8                      8                                                NPCLevel3Deletable,
  9                         9                      9                                                NPCLevel4Collectible,
 10        publi           10                     10                                                NPCLevel4CollectibleExt
 11        publi           11                     11        {
 12        publi           12                     12            public BigInteger currentNumber; // Next number to give out
 13        publi           13                     13        }
 14        publi           14                     14    }
 15                        15    }
 16    ⊟   publi           16    }
 17                                      NPCLevel1Managed,
 18                                      NPCLevel2Persistable,
 19                                      NPCLevel3Deletable,
 20                                      NPCLevel4Collectible,
 21                                      NPCLevel4CollectibleExt
 22        {
 23            public byte[] encodedUsername;
 24            public byte[] encodedPassword;
 25        }
 26    }
```

NeoDraw - NEO Multi-Person Shared Whiteboard dApp
NEO Blockchain as an Enterprise Application Platform

```csharp
NeoCounterL4CustomMethods2.cs*    NeoCounter.cs

NPC.dApps.NeoDraw.Main          NPC.dApps.NeoDraw.Main.NeoCounter          TakeNextNumber(N

18          private static readonly byte[] DOMAINAC = "AppCounters".AsByteArray();
19
20          public enum NeoCounters
21          {
22              UserCounter,
23              PointCounter,
24              UserPointsCounter
25          }
26
27          public static BigInteger TakeNextNumber(NeoVersionedAppUser vau, NeoCounters counter)
28          {
29              NeoCounter nc = NeoCounter.GetElement(vau, DOMAINAC, (int)counter); // Get persisted counter value
30
31              if (NeoCounter.IsMissing(nc))
32              {
33                  nc = NeoCounter.New(); // Create a new counter value
34                  NeoCounter.PutElement(nc, vau, DOMAINAC, (int)counter); // Persist the new counter
35              }
36              else // Get and increment counter value by 1
37              {
38                  BigInteger newNumber = NeoCounter.GetCurrentNumber(nc);
39                  newNumber = newNumber + 1;
40                  NeoCounter.SetCurrentNumber(nc, newNumber);
41                  NeoCounter.PutElement(nc, vau, DOMAINAC, (int)counter); // Persist the new counter
42              }
43
44              return NeoCounter.GetCurrentNumber(nc);
45          }
```

For our next meeting: Create a Meetup sign-in e-dApp

NEO C# Developer Tool Suite (March 2018)

- NEO Blockchain Quick Start Guide for .NET Developers   (mwherman2000/neo-dotnetquickstart)

- NEO Persistable Classes (NPC) Compiler   (mwherman/neo-npcc)
- NEO NEON Compiler   (neo-project/neo-compiler)
- NEO Debugger   (CityOfZion/neo-debugger-tools)

- NEO Node/Wallet (Developer Edition)   (CityOfZion/neo-gui-developer)
- NEO PrivateNet Docker Container   (metachris/neo-privnet-with-gas)
- NEO TestNet Network   (http://docs.neo.org/en-us/node/testnet.html)
- NEO MainNet Network

Smart Contract Development: NEO or ETH?

Compare/contrast Ethereum and the NEO Blockchain

Ethereum

- ETH Smart contract == single object/entity with a simple set of methods and simple types of data

- The Ideal Application?
    - Blockchain version 2.0 Alt tokens
    - Simple, single entity with a few methods

- Beyond that?
    - Very little future for Ethereum as an Enterprise Application platform
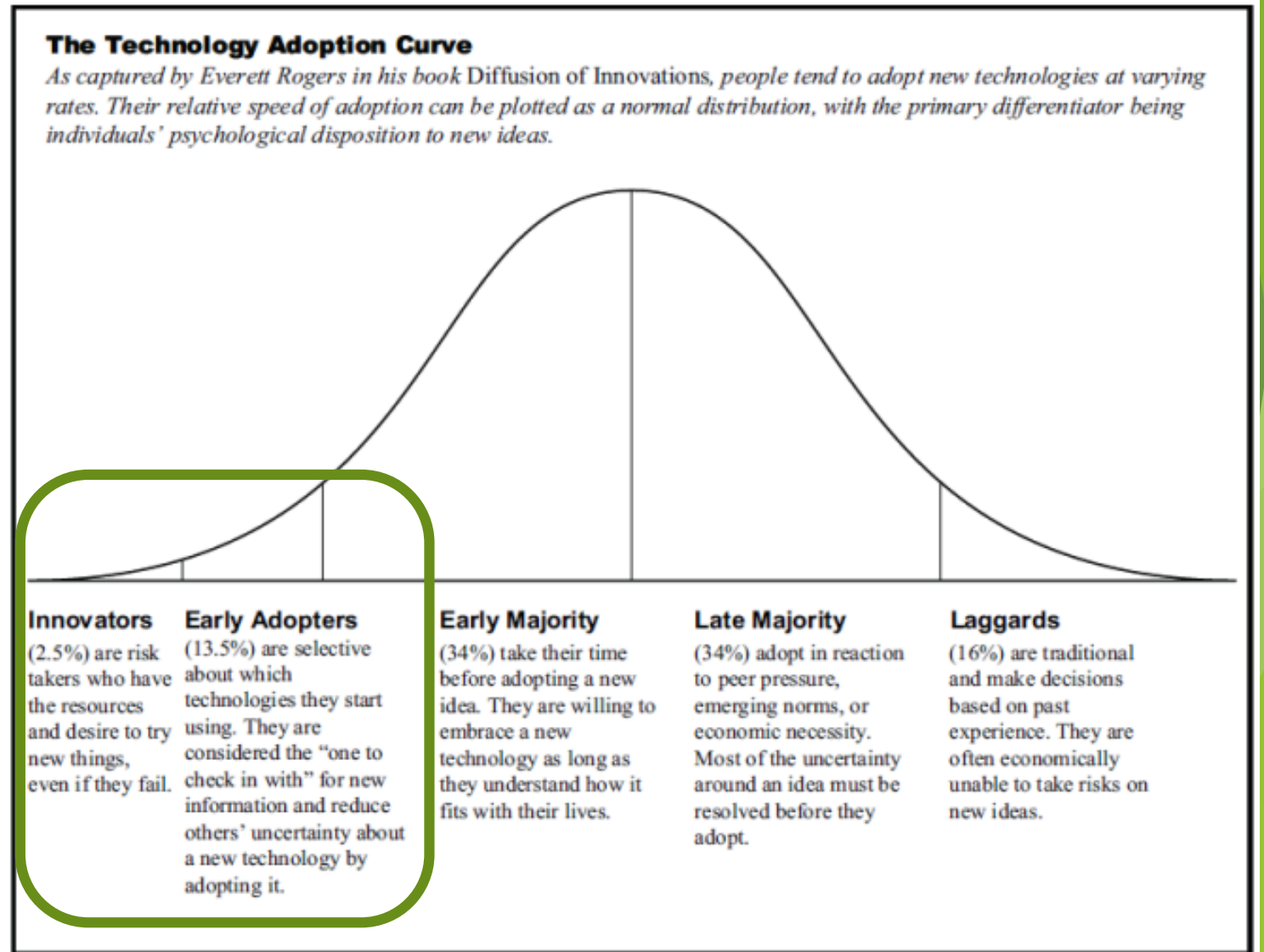   - "One trick pony" x 1500

NEO

- **NEO Smart contract == a program capable of working with dozens of different types of objects/entities**

- Unlimited potential as an Enterprise Application Platform

- Will drive acquisition of NEO

- Automatic accumulation of GAS

- Increased ability to participate in the NEO Smart Economy
    - Voting as well as having operating funds

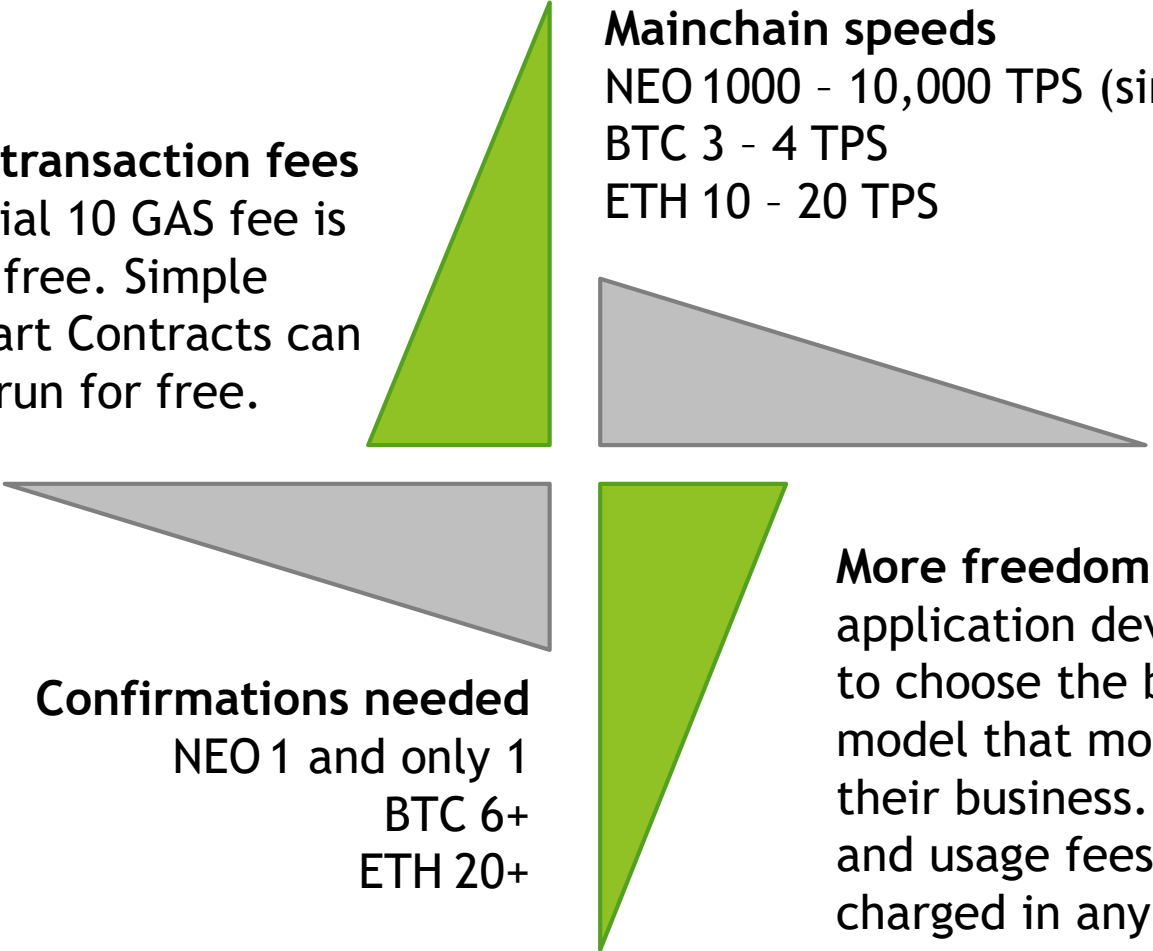The NEO Blockchain is better (superior) for Enterprise Applications

NEO Blockchain as a Enterprise Application Platform

▶ Focus of any new platform…

  ▶ Scalability

  ▶ Reliability

  ▶ Inexperience

  ▶ Right tools

  ▶ Knowledge

  ▶ Education

  ▶ Training

  ▶ …

The Technology Adoption Curve

As captured by Everett Rogers in his book Diffusion of Innovations, *people tend to adopt new technologies at varying rates. Their relative speed of adoption can be plotted as a normal distribution, with the primary differentiator being individuals' psychological disposition to new ideas.*

Innovators
(2.5%) are risk takers who have the resources and desire to try new things, even if they fail.

Early Adopters
(13.5%) are selective about which technologies they start using. They are considered the "one to check in with" for new information and reduce others' uncertainty about a new technology by adopting it.

Early Majority
(34%) take their time before adopting a new idea. They are willing to embrace a new technology as long as they understand how it fits with their lives.

Late Majority
(34%) adopt in reaction to peer pressure, emerging norms, or economic necessity. Most of the uncertainty around an idea must be resolved before they adopt.

Laggards
(16%) are traditional and make decisions based on past experience. They are often economically unable to take risks on new ideas.

NEO is created for Large Scale dApps*

No transaction fees
Initial 10 GAS fee is for free. Simple Smart Contracts can be run for free.

Mainchain speeds
NEO 1000 – 10,000 TPS (single core)
BTC 3 – 4 TPS
ETH 10 – 20 TPS

Confirmations needed
NEO 1 and only 1
BTC 6+
ETH 20+

More freedom for application developers to choose the business model that most suits to their business. Service and usage fees can be charged in any way off-chain.

*dApps – Distributed Apps

NEO Events

Second Wednesday evening of each month

HackCU Episode IV · University of Colorado Boulder
600 Hackers · 24 Hours · February 24th and 25th 2018

NEO
smart economy

March 9th   6pm - 8pm

Sponsored by:

NEX CIC

NEO APAC Tour In March

Meetup   Meetup + Workshop   Meetup

3rd Mar Singapore   Tokyo 5th Mar   11th Mar Taipei   Melbourne TBA   16th Mar Sydney

Meetup + Workshop   Meetup

NEO Events (con't)

Second Thursday evening of each month

1 Week $NEO Wallet Design Challenge!

I will select 3 designs to each win 5 GAS.

1) Create a UI & UX Design for a slick NEO Wallet for desktop.

2) Email your submission to challenge@dean.press

3) Submission deadline is March 7th.

4) Winners announced within a few days.

Good luck! 🤙

NEO dApp Competitions ~USD$500K in prizes
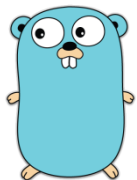
1st NEO Dev Competition

Nov. 20, 2017 - Mar. 31, 2018

NEO smart economy | Microsoft

CITY OF ZION IS LAUNCHING ITS SECOND

DAPPS COMPETITION

And we want you to get involved

The City of Zion council is promoting a decentralised apps (dApps) competition to further elevate the NEO developer community.

NEO News: Switchers

▶ [QTUM to NEO] THEKEY, a Decentralized Ecosystem of Identity Verification Tool Using National Big-data and [NEO] Blockchain
https://www.reddit.com/r/NEO/comments/7areac/ama_on_9th_nov_thekey_a_decentralized_ecosystem/

▶ [ETH to NEO] Guardian Circle announce switch to NEO platform
https://neonewstoday.com/general/guardium-announce-switch-to-neo-platform/
"...the more we dug into NEO, the more we realized that they had really great answers to every one of our concerns with Ethereum and many additional benefits that are unique to the NEO ecosystem."

▶ [ETH to NEO] Narrative project: Big News: KYC and Our Switch to NEO
https://blog.narrative.network/big-news-kyc-and-our-switch-to-neo-2f34215beef9

▶ [ETH to NEO] Concierge.io NEO Token Sale
https://medium.com/@concierge.io/concierge-io-neo-token-sale-f870a0a27b04

▶ [ETH to NEO] IMPORTANT NEWS FOR THE WOWOO COMMUNITY
http://wowoonet.com/news.html#news_2018_6

▶ [ETH to NEO] Three things to consider when choosing a blockchain for your project—or why Veris chose NEO.
https://medium.com/verisfoundation/three-things-to-consider-when-choosing-a-blockchain-for-your-project-or-why-veris-chose-neo-b4483135c382

▶ [Blockchain agnostic strategy] Jibrel Network founder looking to switch from Ethereum to NEO
https://imgur.com/oHYTYi2

What is NEO?
Summary

For large scale decentralized applications, transaction cost, transaction time (including confirmations) is a big obstacle and restriction to possible business models.

NEO is built for large scale dApps and is free to use for the end user. Fees (GAS) are instead charged for deploying contracts and registering assets.

Transaction volume is not an issue with 1000TPS+ on main chain and plenty off-chain scaling possibilites.

NeoX will make the NEO ecosystem quite unique. NEO contain the public ledger for digital assets, identity and smart contracts.

NEO Resources: Videos and Webcasts

► The New Vision - Da Hongfei
https://www.youtube.com/watch?v=th7jZlmoZBc

► Malcolm Lerider: Clarification on NEO, GAS and Consensus Nodes
https://www.youtube.com/watch?v=iV4WREWtCiI

► A Deep Dive into NeoVM & NeoContract [English Subtitles]
https://www.youtube.com/watch?v=fLppte-guYE

► NEO Persistable Classes (NPC) e-dApp Smart Contract Platform 2.0: Deep Dive
https://www.youtube.com/watch?v=Nj4-m2o94VE

NEO Resources: NEO DevCon 1, January 2018

- The New Vision - Da Hongfei | NEO DevCon 1
  https://www.youtube.com/watch?v=th7jZlmoZBc

- Opening Address - Scott Hunter, Microsoft | NEO DevCon 1
  https://www.youtube.com/watch?v=ZFsu5HPU2xM

- Ontology, The Technical Vision of Distributed Trust Networks | NEO DevCon 1
  https://www.youtube.com/watch?v=QyaZz0vtONs

- Imusify, Decentralized Platform for Music Related Digital Content | NEO DevCon 1
  https://www.youtube.com/watch?v=dgmfO8nKJkE

- NeoAuth, Login Using the NEO Blockchain | NEO DevCon 1
  https://www.youtube.com/watch?v=F7teukbcbIg

- Phantasma, User-Owned Content | NEO DevCon 1
  https://www.youtube.com/watch?v=cinexz6gjsU

- NEO•ONE, Development Framework | NEO DevCon 1
  https://www.youtube.com/watch?v=yWzjNhiZFmA

- THEKEY, A Decentralized Ecosystem of An Identity Verification Tool | NEO DevCon 1
  https://www.youtube.com/watch?v=St-UW0lPB7o

- NEO's Global Vision and the Evolving Regulatory Environment - Miles Graham | NEO DevCon 1
  https://www.youtube.com/watch?v=FidRGNeab3I

- NEX, Decentralized Exchanges | NEO DevCon 1
  https://www.youtube.com/watch?v=1005ed20e0Q

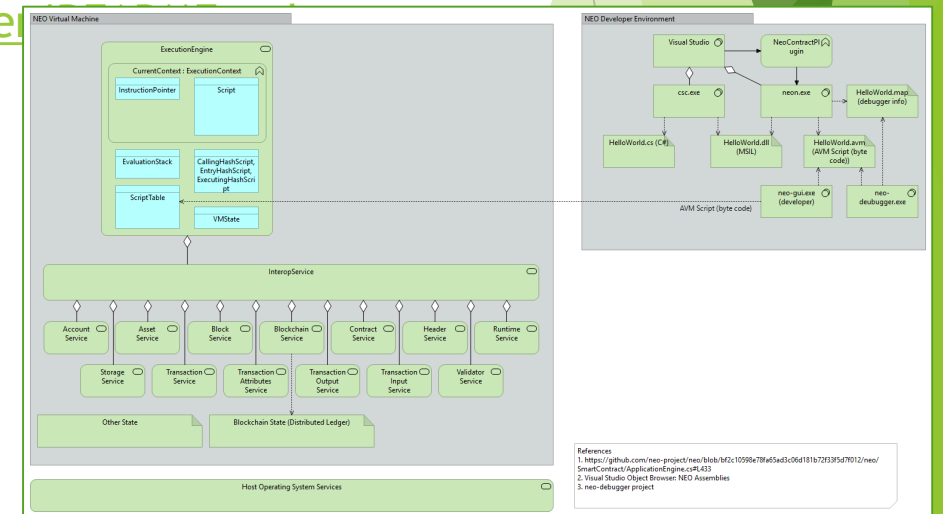# NEO Resources

General

- NEO.org
  http://neo.org

- NEO Tutorials (C#, Java, Python), API docs
  http://docs.neo.org

- NEO DevCon "Th New Vision" Keynote by NEO Founder
  https://www.youtube.com/watch?time_continue=3&v=th7jZlmoZBc

Developers

- N NEO C# Developers Center of Excellence (neo-csharpcoe)
  https://github.com/mwherman2000/neo-csharpcoe/blob/master

- Discord NEO Community (like Slack)
  https://discord.gg/gqCYeup

- The NEO Project
  https://github.com/neo-project

- City of Zion **awesome-neo** project: Developer Docs
  https://github.com/CityOfZion/awesome-neo/
  #developer-documentation

NEO Blockchain C# Developers Center of Excellence
https://github.com/mwherman2000/neo-csharpcoe

▶ Founder: Michael Herman (neotoronto@outlook.com)

▶ NEO Blockchain end-to-end, detailed guidance for .NET developers

▶ Content purposely designed to help .NET developers ramp up and become productive more quickly

▶ Repository for content presented at the NEO Blockchain Toronto meetup group

▶ Contents

    ▶ NEO Blockchain Quick Start Guide for .NET Developers
    https://github.com/mwherman2000/neo-dotnetquickstart

    ▶ NEO Blockchain Architecture Reference Model (ARM) for .NET Developers (neo-charm)
    https://github.com/mwherman2000/neo-charm

    ▶ NEO Blockchain Toronto
    https://github.com/mwherman2000/neo-windocs/tree/master/events/2018-neo-blockchain-toronto

NEO Blockchain Quick Start Guide for .NET Developers

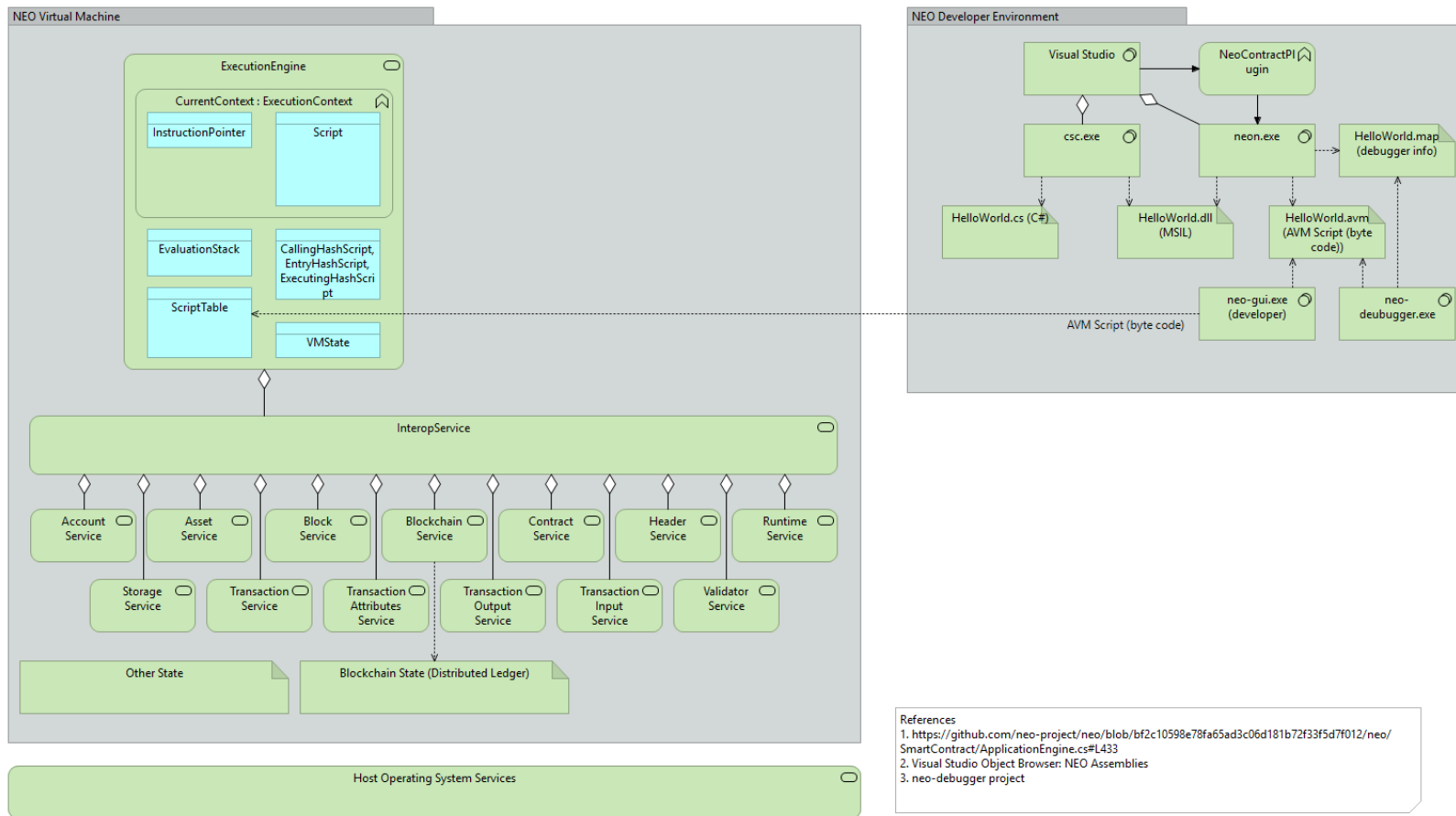https://github.com/mwherman2000/neo-dotnetquickstart/blob/master/README.md

1. Pre-requisites and Recommendations

2. Download and install Visual Studio 2017 Community Edition integrated development environment (IDE)

3. Download and unpack NEO developer tool projects (source)

4. Coffee time: Wait for previous activities to complete

5. Install NeoContractPlugin Visual Studio extension

6. Build and test NEO developer tool projects (from source)

7. Download, install, and test Docker platform

8. Download and test NEO privatenet Docker container

9. Create and compile HelloWorld smart contract sample

10. Deploy and test the HelloWorld smart contract

11. Celebrate

▸ Appendix A - Checklist

▸ Appendix B - Roadmap

▸ Appendix C - Reset NEO privatenet Environment: Container, Wallets, and Clients

Statistics

▸ 10 activities comprising 130 documented tasks (approximately)

▸ 140 screen shots (approximately)

▸ 7 batch files

▸ 2 JSON configuration files

▸ 1 C# code snippet

NEO Blockchain Architecture Reference Model (ARM) for .NET Developers (neo-charm)

https://github.com/mwherman2000/neo-charm/blob/master/README.md

NEO Blockchain Toronto
https://github.com/mwherman2000/neo-csharpcoe/tree/master/events

I leave you with a challenge...
Become part of the NEO Smart Economy

hyperonomy.com – digital intelligence (my blog)
https://hyperonomy.com/2018/01/24/tokenization-of-every-little-thing-elt/

Our Values as *Neoxplorers*

We <u>operate</u> like the NEO Blockchain

- Decentralized
- Community based
- Consensus driven
- Creators of value
- Store of value (knowledge)
- Transfer of value (training)
- Multi-disciplinary
- Multi-application
- Multi-technology

We <u>behave</u> like the NEO Blockchain

- Robust
- Reliable
- Transparent
- Smart
- Open
- Non-discriminatory
- Participatory
- Diversity
- Committed

Questions?

Thank you for coming out this evening

Backup Slides

NEO System Fees

	NEO [Gas]		NEO [Gas]
Runtime.CheckWitness	0.2	OpCode.PUSH16 [or less]	0.00
Blockchain.GetHeader	0.1	OpCode.NOP	0.00
Blockchain.GetBlock	0.2	OpCode.APPCALL	0.01
Blockchain.GetTransaction	0.1	OpCode.TAILCALL	0.01
Blockchain.GetAccount	0.1	OpCode.SHA1	0.01
Blockchain.GetValidators	0.2	OpCode.SHA256	0.01
Blockchain.GetAsset	0.1	OpCode.HASH160	0.02
Blockchain.GetContract	0.1	OpCode.HASH256	0.02
Transaction.GetReferences	0.2	OpCode.CHECKSIG	0.10
Account.SetVotes	1	OpCode.CHECKMULTISIG [per signature]	0.10
Validator.Register	1000	Other OpCodes	0.001
Asset.Create （system asset）	5000		
Asset.Renew （system asset）	5000		
Contract.Create	500		
Contract.Migrate	500		
Storage.Get	0.1		
Storage.Put [per KB]	1.0		
Storage.Delete	0.1		
Other OpCodes	0.001		