Abstract

Problem Statement

With the advent of blockchain's private, permissioned networks, developers in various industries are tasked with implementing a daunting set of options to ensure transactional and institutional security.
Developed by J.P. Morgan Chase to address this task, Quorum supports transactional volumes per institution, with privacy at the transaction level. Quorum is a blockchain consortium (private network), with support for smart contract business logic applications, and a proprietary dashboard interface called Cakeshop for managing the network and contracts.

In this demo, we will:

- Discuss the security options of the Quorum Single Member Blockchain Network
- Deploy one, exploring PowerShell options for displaying and creating resources

High-Level Overview of steps:

Install or download from Azure Portal:

- Quorum Single Member Blockchain Network
  Configure:
- JSON template variables and parameters (if desired)
- PowerShell script for Automation Account

File Information:

- Format of code files: JSON (47 kb), .PS1 (4 kb)
- Hardware: Quorum Consortium blockchain VMs (2), Standard, LRS storage; Standard D1 v2 size
- Software: Ubuntu Server 16.04 (guest); Windows 7 (host)

Sources:

- Ethereum white paper
- Quorum white paper
- Quorum documentation link from Azure portal

URLs:

- Short Video: https://www.youtube.com/watch?v=k5czvZfoHYY
- Long Video: https://www.youtube.com/watch?v=5g-Xy82pfKw
- GitHub Repository with all artifacts:
  https://www.github.com/healthdatachick/FinalProject

Findings

- Blockchain is still a new, open-source technology, and SDKs are still being updated.

Pros

- Fast deployment
- High security is available, including at the transaction level and around permissions
- Ease of use with admin portal
- One language for smart contract writing
- Immutable ledger
- Smart contracts catch suspicious behavior

Cons

- Solidity not supported everywhere, limited IDEs; VS extension and Ethereum Studio deprecated