



Tokenized Municipal Bonds



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Tokenization

“Tokenization is the process of transforming ownerships and rights of particular assets into a digital form.”

-Blockchain Council



From simple transactions to art, anything from which data can be derived may be tokenized.

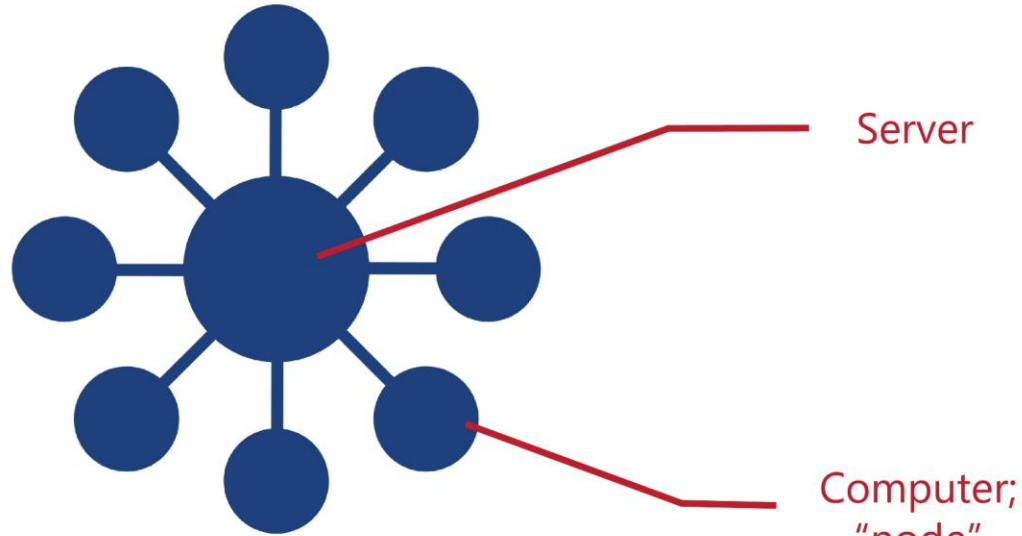
Municipal Bonds Today

- Nonuniform issuances
- High administrative costs associated with issuances, especially low-dollar issuances
- High costs result in bond denominations of \$5,000 (often \$100,000)
Narrows market and reduces number of potential market participants by often precluding moderate-income households from investing
- Bond purchasers are often nonlocal institutional or high-net-worth investors
Funds used for repayment no longer circulate within local economy but instead go to financial centers and wealthy areas

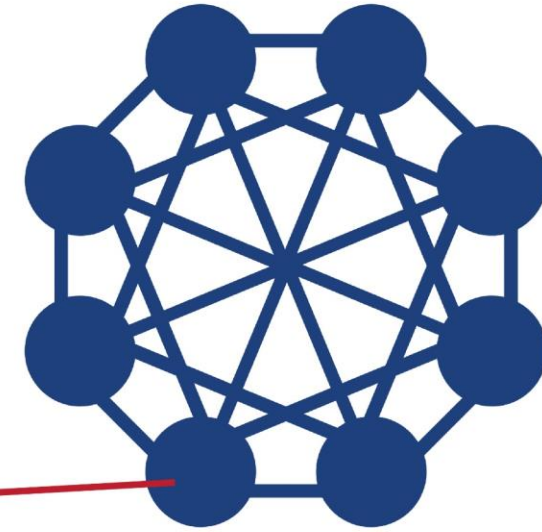


Blockchain Technology

Blockchain is a **distributed digital ledger**.



Centralized



Distributed

Blockchain Technology

- Each node operating on the blockchain records and verifies transaction information.

These nodes cannot change the information. They can only record and verify it.

This helps to secure the accuracy of the blockchain's transaction information.

- Agreements can be tokenized and automated using a "smart contract."

A smart contract is a piece of software stored on a blockchain that automates the execution of all of parts of an agreement.

A smart contract is not necessarily a legal contract, but it can be.



Tokenized Municipal Bonds

Bond transactions are recorded on the blockchain ledger.

Bondholders and their investments are memorialized on the ledger.

No securities depository is required to track investors.

Bond payments may be automated via smart contracts.

Bondholder can be automatically issued payment when payment is due.

No trustee required to repay bondholders

Ability for governments to reduce reliance on commercial banks.

This reduces issuance and trading costs.

Cost reductions allow bonds to be issued in smaller denominations

State Government Initiatives

Colorado

- Senate Bill 22-025 (June 8, 2022)
- Treasurer will study use of blockchain in raising capital for state government
- Bill acknowledges potential of tokenized public debt to:
 - Expand bond market
 - Increase market inclusion
 - Save on issuance costs
 - Reduce interest rates for municipalities
 - Reduce state's reliance on commercial banks and other financing methods subject to high underwriting fees
- Colorado seeks to be a leading state in the adoption of blockchain technology

Local Government Initiatives

Berkeley, CA

- Since 2019: Berkeley has been working to develop tokenized municipal bonds
- December 2021: City Council unanimously approves city manager to work with blockchain development firm to create tokenized microbonds
 - Bond denominations lowered to \$100 or less
- Berkeley will seek to raise \$4M to purchase firetrucks
- Hopes to use tokenized bonds to fund affordable housing development and to allow residents to invest in solar energy
- Partnering with private vendor to develop first issuance



Legal Considerations

Federal

- Municipal bonds subject only to SEC anti-fraud provisions
Exempt from reporting requirements
- Brokers and dealers are subject to SEC & MSRB rules
If a private firm owns the blockchain data, may negate some cost savings because private firm subject to broker/dealer regulations
- Federal government has yet to regulate blockchain or cryptocurrency
President's Working Group on Financial Markets *Report on Stablecoins*: White House's first official study of future cryptocurrency regulation
Must ensure any future regulations don't inadvertently capture municipal bonds issued in stablecoins

Pennsylvania

- Broad authority given to local governments regarding process for bond issuances
Act 53 (Local Government Unit Debt Act) establishes debt limits, calculation procedures, and classifies certain types of bonds.

Policy Considerations

- Need to educate the public for successful issuance
- Best for smaller issuances (<\$10M)
- May require local government to update technology
- Allows broader public support for local development initiatives by providing a means for local citizens to help fund them
- Keeps local bond repayment dollars circulating throughout local economy, stimulating growth
- Unlocks local pools of capital and expands bond market inclusion
- Potential to reduce local government's interest rates
- Local government continues to control the investment agenda

The image features decorative circuit board patterns in the four corners. These patterns consist of light blue lines forming various geometric shapes, including rectangles and zig-zags, with small circles at the ends of the lines, resembling a printed circuit board (PCB) layout.

Conclusion