

QubitCoin Whitepaper v2.0 - (30-40)

- QubitCoin

QubitCoin

6 2025 .

QubitCoin (QBC), - , RubikPoW,
, , Rubik's Cube.
, , QubitCoin,
, Shor Grover.
Rubik,
, . 30-40
, QubitCoin

1

QubitCoin (QBC) , RubikPoW,
, Rubik's Cube.
, RubikPoW
Rubik's Cube , Shor Grover.
QubitCoin , .
,

2

2.1

, , , RSA ECC,

2.2

- :
 - :
 - :
- : RSA, ECDSA

2.3

” - ” , NIST, :

- 1.
2. /
3. ,
4. ,

3 RubikPoW

3.1 Rubik's Cubes

$n \times n \times n$ Rubik's Cube G_n .

,

3.1 (Rubik's Cube). $n \times n \times n$ Rubik's Cube :

$$|G_n| = \frac{8! \cdot 3^7 \cdot 12! \cdot 2^{11} \cdot \prod_{i=1}^{\lfloor (n-2)/2 \rfloor} (24!)^i}{2} \cdot \frac{24!}{2}^{\lfloor (n-3)/2 \rfloor}$$

:

- 8 3 (7)
- 12 2 (11)
- $\lfloor (n-2)/2 \rfloor$ 24
-

n=3: $|G_3| = 43,252,003,274,489,856,000 \approx 4.3 \times 10^{19}$

n=4: $|G_4| \approx 7.4 \times 10^{45}$

n=5: $|G_5| \approx 2.8 \times 10^{74}$

□

3.2

$n \times n \times n$ Rubik's Cube NP-

, ,

3.3

RubikPoW

Rubik's Cube.

$n \times n \times n$ Rubik's Cube

:

$$T_{classical} = O(|G_n|)$$

:

$$T_{quantum} = O(\sqrt{|G_n|})$$

n=3:

$$T_{classical} \approx 2^{65.2}, \quad T_{quantum} \approx 2^{32.6}$$

n=4:

$$T_{classical} \approx 2^{151.8}, \quad T_{quantum} \approx 2^{75.9}$$

n=5:

$$T_{classical} \approx 2^{245.7}, \quad T_{quantum} \approx 2^{122.9}$$

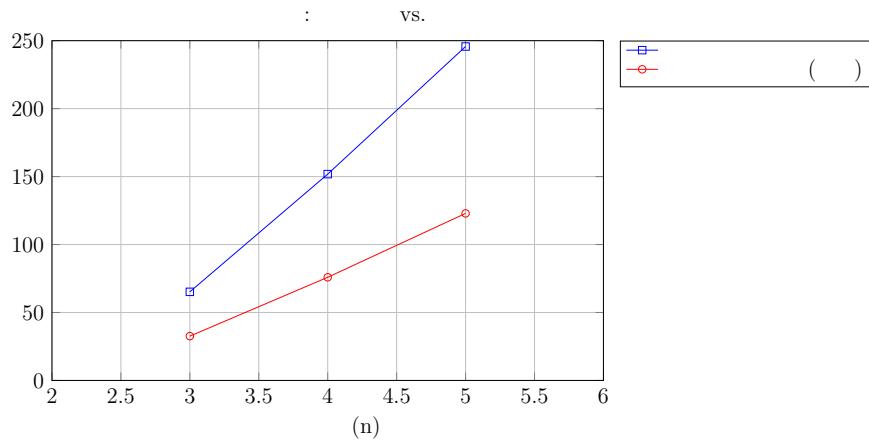
3.4

RubikPoW $O(k)$, k -

RubikPoW:

1. :

2. : , , ,



. 1: vs.

3. $i = 0 \dots 7$:

- $state.corners[i].position \neq i$ OR $state.corners[i].orientation \neq 0$
- **return** False

4. $i = 0 \dots 11$:

- $state.edges[i].position \neq i$ OR $state.edges[i].orientation \neq 0$
- **return** False

5. $i = 0 \dots NumCenters(state.size)$:

- $state.centers[i].position \neq i$
- **return** False

6. **return** True

4 RubikPoW

4.1

QubitCoin , :

```
struct RubikBlock {
    uint32 version;
    bytes32 prev_block_hash;
    bytes32 merkle_root;
    uint32 timestamp;
    uint32 difficulty;           //      n
    uint8 cube_size;             // n   n×n×n
    uint16 max_moves_allowed;    //
    bytes32 initial_cube_state; //
    bytes32 final_cube_state;    //
    uint16 solution_length;      //
}
```

```

    uint8[solution_length] solution;      //
    uint64 nonce;                      //
    bytes32 block_hash;                //
    Transaction[] transactions;        //
}

```

4.2

- :
1.
- 2. , A* IDA*
- 3.
- 4. -
- 5. ,

4.3

- RubikPoW :
- (n×n×n): n
 - :
 - : Bitcoin

$$D_{total} = D_{size}(n) \cdot D_{moves}(k) \cdot D_{hash}(target)$$

:

$$D_{size}(n) = \log_2(|G_n|)/\log_2(|G_3|) \quad (1)$$

$$D_{moves}(k) = \quad (2)$$

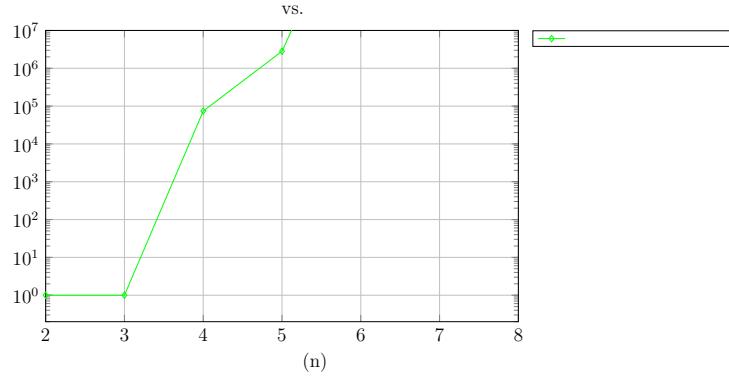
$$D_{hash}(target) = 2^{256}/target \quad (3)$$

5

5.1 PoW

5.2

- , RubikPoW :
- 1. : , IDA*,
 - 2. :
 - 3. :
 - 4. : , ,



. 2:

SHA-256 (Bitcoin)	N/A	$2^{128} \rightarrow 2^{64}$		-
Scrypt (Litecoin)	N/A	$2^{128} \rightarrow 2^{64}$	Memory-hard	-
Equihash (Zcash)	N/A	$2^{n/2} \rightarrow 2^{n/4}$		
RSA-2048	2^{112}	N/A		
ECC-P256	2^{128}	N/A	DLP	
RubikPoW-n	N/A	$\sqrt{ G_n }$		

1:

5.3

, , RubikPoW

,

6

6.1

	(QBC)	%
	21,000,000	100%
(PoW)	14,700,000	70%
/	4,200,000	20%
/	2,100,000	10%

2: QubitCoin

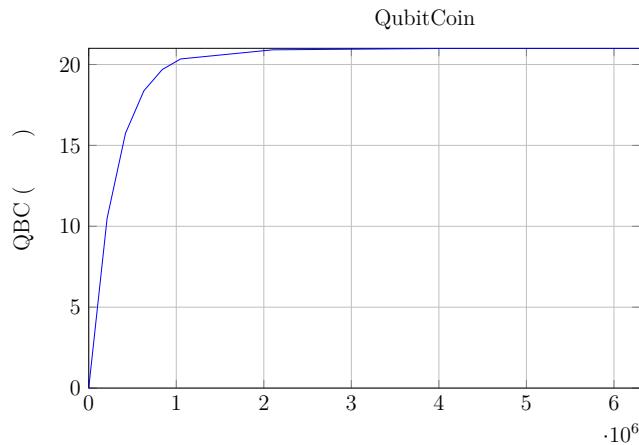
6.2

QubitCoin , , RubikPoW:

- 210,000 (4)
- 50 QBC

- 2140

- 21



.. 3: QubitCoin

6.3

, , , :

- 40%
- 25%
- 20%
- 15%

7

7.1 2025-2026

Q4 2025	Whitepaper v1.0	whitepaper'
Q1 2026		
Q2 2026	Genesis Mainnet	mainnet QubitCoin
Q3 2026	SDK'	SDK'
Q4 2026	DEX	

7.2 2027-2029

Q1 2027	-	-

Q2 2027		
Q3 2027		
Q4 2027		
Q1 2028		
Q2 2028	DApps	
Q4 2029	-	

8

8.1

- | | | |
|-----------|-----------|----------|
| QubitCoin | Substrate | |
| • | : | |
| • | : | RubikPoW |
| • | : | RubikPoW |
| • | : | Libp2p |
| • | : | |

8.2 RubikPoW

RubikPoW	:	
pub struct Pallet<T>(PhantomData<T>);		

```
impl<T: Config> Pallet<T> {
    pub fn submit_solution(
        origin,
        solution: Vec<Move>,
        nonce: u64
    ) -> DispatchResult {
        //
        ensure_signed(origin)?;

        //
        Self::validate_solution(&solution)?;

        //
        Self::check_difficulty(&solution, nonce)?;

        //
        Self::process_reward(&sender)?;
    }
}
```

```

    Ok(())
}

fn validate_solution(solution: &[Move]) -> bool {
    //
    let mut state = Self::get_initial_state();
    for move in solution {
        state.apply_move(move);
    }

    //
    state.is_solved()
}

fn check_difficulty(solution: &[Move], nonce: u64) -> bool {
    let hash = Self::calculate_block_hash(solution, nonce);
    hash < Self::get_current_target()
}
}

```

8.3

```

pub struct RubiksCubeState {
    corners: [CornerPiece; 8],
    edges: [EdgePiece; 12],
    centers: Vec<CenterPiece>,
    n: u8, // : n×n×n
}

#[derive(Copy, Clone, PartialEq)]
pub enum CornerPiece {
    Solved(u8), // ,
    Permutated(u8, u8) // ,
}

#[derive(Copy, Clone, PartialEq)]
pub enum EdgePiece {
    Solved(u8),
    Permutated(u8, u8)
}

pub enum Move {
    U, Up, U2, // ,
    D, Dp, D2, // ,
    L, Lp, L2, // ,
    R, Rp, R2, // ,
    F, Fp, F2, // ,
}

```

```

B, Bp, B2,      //
//  

Uw, Dm, etc... //  

}

```

9

9.1

QubitCoin 7-10
 10 . , ,

9.2

RubikPoW , - ,
 PoW.

9.3

	(USD)	/tx	()
	\$0.25	1520	0.08
Ethereum	\$1.50	45	0.015
QubitCoin ()	\$0.15	85	0.04

5:

10

10.1

1. :
2. :
3. :
4. : RubikPoW

10.2

- SDK (Rust, JavaScript, Python)
- RESTful API
-
-

11

11.1

-
-
-
- -

11.2

1. 51% : - PoW
2. :
3. :
4. :
5. - :

12

12.1 (DeFi)

QubitCoin DeFi :

-
-
-

12.2

-
- -
-

12.3

-
-
-

13

13.1 A:

	<i>Rubik.</i>	Rubik's Cube G_n	-
:	:	:	
1.	: 8 , 3 . 8-		7,
	8!	3^7	
2.	: 12 , 2 . , 12-		11,
	$12!$	2^{11}	
3.	: (n - 4) 24 , $(24!)^i$		
	.	.	
4.	: : :		, 2.
5.	: (n - 3)		,
	$\left(\frac{24!}{2}\right)^{\lfloor(n-3)/2\rfloor}$.	
	,	.	□

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