Online Music Teaching Resource Sharing Algorithm Based on Blockchain Technology

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Abstract—Blockchain technology provides technical support for cloud computing data sharing in data storage and data access, and ensures the safe and effective transmission of data sharing. The online music teaching resource platform based on blockchain technology faces the problems of low data throughput, large delay and unstable performance. Therefore, a blockchain-based sharing algorithm (Practical Byzantine Fault Tolerance, PBFT), PBFT algorithm is proposed. Consensus allows 1/3 of cheating points in the blockchain, and authenticated transactions are confirmed through a confirmation mechanism to ensure data security. However, the traditional PBFT algorithm lacks an efficient node joining and exiting mechanism, and has problems such as low data throughput. Therefore, on the basis of the traditional PBFT algorithm, a blockchain sharing algorithm (WBFT) that improves the weighted Byzantine fault tolerance mechanism is proposed. A weighting mechanism is added in the consensus process. After the consensus, the node behavior will dynamically adjust the weights to reduce the adverse impact of malicious nodes on the data and improve the overall data sharing effect. Experimental performance tests show that the improved WBFT algorithm performs best in multi-algorithm delay performance tests. In the data average throughput test, the performance of the improved WBFT algorithm is 20.2% higher than that of the traditional PBFT algorithm. In the security test, the improved WBFT algorithm has the best performance. The proposed improved WBFT algorithm can well meet the needs of building an online music teaching resource sharing platform. The research content has important reference value for the application of blockchain technology in the education industry, and is conducive to promoting the development of modern education.

Keywords—blockchain technology, online music teaching, sharing algorithm, weight

1 Introduction

With the vigorous development of modern information technology, the security and stability of information data has attracted much attention. Blockchain technology is a technical solution for distributed data storage, point-to-point data transmission, consensus mechanism, etc. to meet data security sharing. With the continuous advancement of the era of big data, blockchain technology is widely used in financial markets, education industry, enterprise data management and other fields [1]. The emergence of blockchain technology will effectively ensure the safe and stable transmission of data. Blockchain technology ensures the security and effectiveness of data transmission through the intervention of the network shared blockchain structure [2]. At the same time, the Internet security system built through blockchain technology can better meet the requirements of large-scale data interaction experience, avoid malicious tampering and destruction of data, and ensure the smooth development of work. At present, the security and stability of data in the construction of music online platform is the difficulty of platform construction. The application of blockchain technology in the online music mathematics platform will provide technical support for the effective sharing of music teaching resource data [3]. In particular, the online data sharing platform based on cloud technology, based on big data technology and artificial intelligence technology, ensures the reliable transmission and stable sharing of online data, and avoids the risk of data leakage. Therefore, in the construction of the online music teaching platform, the latest blockchain technology will be used to build a music teaching platform to ensure the effective sharing and transmission of data communication. The research content provides important technical reference for the reform, innovation and development of modern education.

2 Related work

Blockchain technology is widely used in the field of data security and has important applications in the construction of educational online education platforms. Researchers at home and abroad have done a lot of work on the research of blockchain technology. Vicariana et al. Agribusiness was found to be a risk-prone business. They control the quality of agricultural products by tracking the supply chain of their products based on blockchain technology. The results show that blockchain technology reduces the supply or participants in the supply chain process [4]. Surjandy et al. Trying to explore the latest trends in the development of organizations affected by blockchain technology and process papers using the vosviewer tool. Research shows that blockchain technology is the finishing touch for the development of smart contract systems and organizations [5]. Jagadhesan et al discovered that cryptocurrencies are done with the help of blockchain technology. The application areas of machine learning are explored and the results show that the implementation of blockchain is beneficial [6]. Hameed et al. propose a new scalable solution for key and trust management of IOT devices in an IOT network. The results show that access latency and throughput are not affected linearly or exponentially [7]. Bhardwaj et al. It is found that SMEs have the potential to understand the important factors to consider when adopting blockchain technology in their supply chain, and propose a new integrated technology adoption framework for future research. The technology works in a distributed network, and every transaction is verified and recorded by the consensus of nodes on the chain [8]. Flowick et al. Discover that blockchain promises to enable new types of inter-organizational relationships, new forms of governance, and new ways of settlement and clearing processes. They use the Analytic Hierarchy Process to analyze the collected data. Experiments show that the quality of the infrastructure is more important than the characteristics related to the transformational potential of blockchain [9]. Huang et al. comprehensive review of blockchain-based voting systems is presented and categorized based on some characteristics. By systematically analyzing and comparing different blockchain-based voting systems, several limitations and research opportunities were identified [10]. Messenger et al. It was found that a large amount of information stored in a heavily loaded system could be severely leaked. To solve this problem, a modifiable red-black tree algorithm can be used to find practical problems in computational usage [11]. Hadala et al. Examines how blockchain technology can be enhanced and integrated with enterprise systems to illustrate the capabilities and potential of blockchain technology. Results suggest that blockchain can enhance es by enabling a single source of truth and a common environment for sharing information among a wider range of actors and organizations [12].

At the same time, computer neural network algorithms are widely used in blockchain technology, ensuring the safe and stable transmission of information and data. Wu He et al. An energy-efficient dynamic task offloading algorithm is developed to address the trade-off between limited computing power and high latency. Experimental results show that the algorithm can achieve energy-saving offloading decisions with relatively low computational complexity [13]. Wu et al. Research the consensus algorithm of the blockchain to improve the performance of the blockchain. A blockchain hybrid consensus algorithm that combines the advantages of particle swarm algorithm and consensus algorithm is proposed. Experimental results show that the improved hybrid consensus algorithm has good scalability, high throughput and low latency [14]. Yang et al. It is found that the traditional operating mechanism follows a centralized design and is usually not very secure, so the blockchain technology is introduced into passive energy. The results show that a blockchain-based trading energy platform is feasible in practice. The decentralized trading algorithm reduces the user's individual cost by 77% and the overall cost by 24% [15]. Chen et al. It was found that computing power in blockchains is often limited. A multi-hop cooperative distributed computing offloading algorithm is proposed. The results show that the distributed algorithm scales the number of IoT devices well and has minimal system cost compared to other methods [16]. Ash Hermione et al. A new method is proposed to reduce the memory requirements of blockchain nodes using error correction codes. The results show that it is only necessary to send newly mined blocks to a small number of authenticating nodes and reduce the network load [17]. Car odometer fraud by Abbade and others is a problem that costs billions of dollars around the world. The question of how blockchain technology can be used for this purpose is raised. The results validate the solution, which can verify a new block in the blockchain every two seconds [18].

It can be seen from relevant domestic research that domestic and foreign researchers have conducted in-depth research on blockchain technology and application value, and have achieved good results in various fields. This research applies the blockchain sharing algorithm to the field of modern education online education, provides technical support for the safe and efficient transmission of online information data, and improves the effect of online education and teaching.

3 Research on teaching sharing algorithm based on improved Byzantine fault tolerance mechanism

3.1 Research on traditional PBFT blockchain sharing algorithm

The online music teaching platform uses blockchain technology to build a teaching resource sharing platform. The underlying foundation of the data platform adopts the public chain and public chain environment to realize data sharing based on the enterprise alliance chain. The data and information in the teaching system will be processed and transmitted through the P2P network under the system. At the same time, the data system will achieve a decentralized transmission effect to ensure the safe and reliable transmission of information and data. At the same time, the effective application of the blockchain distributed consensus framework can significantly improve the consensus throughput of the blockchain system and enable the related supporting industries to achieve unprecedented development. In the construction of the online music teaching resource sharing platform, each node in the block network will be used as a distributed storage copy, and the communication between nodes will be realized by means of the P2P network. Figure 1 shows the blockchain communication network structure.

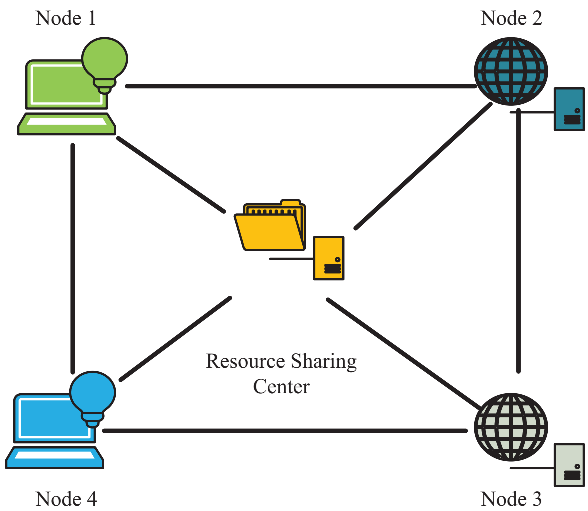

Fig. 1. Shows the blockchain communication network structure

As can be seen from Figure 1, in the blockchain communication, in order to ensure the security of the transmission of teaching data, a consensus algorithm will be used for processing. The consensus algorithm will build new blocks and sync them in their own database by each node. Once the transaction information is verified, the information data packaged into the block can no longer be modified. This blockchain mechanism can ensure the safe and effective transmission of information data. The blockchain is a chain structure composed of several blocks, and the link time and link form are related to the hash value. The internal structure of this area is shown in Figure 2.

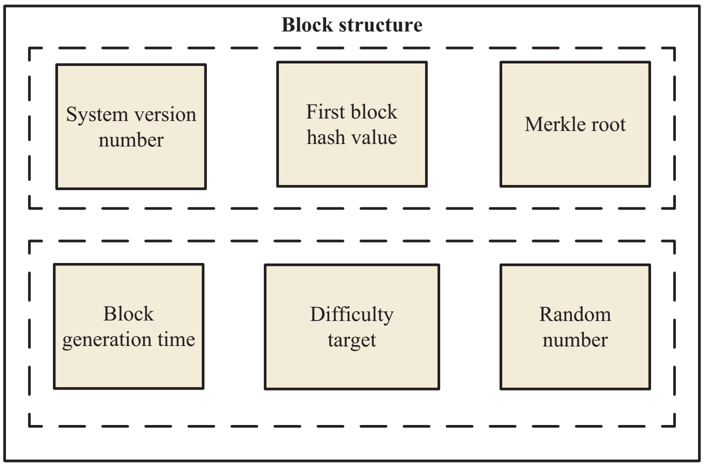

Fig. 2. Shows the internal structure of the blockchain network

Once a new block is formed, verify that all nodes synchronize data, and the data stored in the block will not be modified. Once the node data is modified, the block transaction will change, but the single modified data will not be verified and synchronized to ensure the security of data transmission. The PBFT algorithm is a consensus mechanism evolved from the Byzantine general problem. Considering the problems of data loss and data unreliability in the blockchain network, the PBFT algorithm is significantly better than other consensus algorithms in terms of data processing complexity and execution effect.

The PBFT consensus allows 1/3 of the cheating points in the blockchain. Authentication transactions are confirmed through a confirmation mechanism to ensure the safety and reliability of transaction information. Figure 3 shows the process of PBFT algorithm consensus.

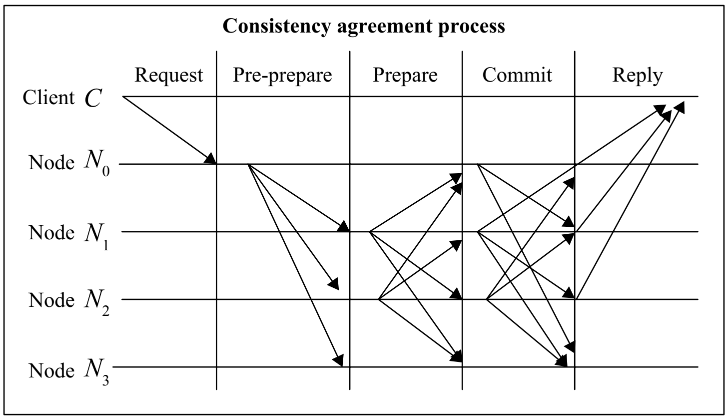

Fig. 3. Consensus process of PBFT algorithm

As shown in Figure 3, the PBFT consensus process first obtains data confirmation in the pre-preparation state, enters the pre-preparation state, and the confirmed data enters the submission state. After getting enough confirmed requests, the system sends a reply request to the system that the transaction has gone through and is linked. Finally, the system confirms the transaction of the reply message. In the PBFT algorithm, all nodes are divided into three types: client, primary and secondary, and as long as the client at least confirms, the $n + 1$ final result is only valid if the nodes are the same. The traditional PBFT algorithm needs to transmit a three-phase consensus M message, and the expression is shown in formula (1).

$$M = 2n^2 - 2n \tag{1}$$

It can be seen from equation (1) that with the increase of data information transmission times, the number of nodes in the cluster will continue to increase. In the request state, the client C sends a data confirmation message $< REQUEST, m, t, c >$ to the master node, N_0 where the m data content is requested, and c for the client identity information, it t is a timestamp.

In the pre-preparation state, the node N_0 will receive the confirmation application information m, and m obtain the application information in the pre-preparation state for the allocation sequence number, in $\langle\langle PRE - PREPARE, v, n, d\rangle, m\rangle$ which the master node assigns the number d for the request data, the summary information for the request data, and v the view number.

In the ready state, other nodes need to interact after receiving confirmation of the prepared data. And send interaction messages from nodes to other nodes, $\langle PREPARE, v, n, d, i\rangle$ where i the message of the node sending the message is marked. During this process, the outgoing interactive messages are validated. If present, $2f+1$ if the interact message is consistent with the prepare message, go to the next state.

In the commit state, all nodes, including the master node, send confirmation information to other nodes $\langle COMMT, v, t, n, D(m)\rangle$, $D(m)$ requesting node signatures. When a $2f+1$ message is verified, the task of this stage is completed.

In the reply state, after confirming the information, each node will send a reply message to the client $\langle REPLY, v, t, c, i, r\rangle$, which is the final result of the request. If there is a $f+1$ consistent reply, it means that the sent data request was executed successfully.

The traditional PBFT algorithm lacks an efficient node joining and exiting mechanism in the blockchain system, making the system unable to meet complex blockchain usage scenarios. At the same time, the traditional PBFT algorithm is not perfect in dealing with malicious nodes, and using its own $(n - 1)/3$ fault tolerance capability compatible with malicious nodes will affect system stability and data security. In addition, the three-segment broadcast protocol used in the traditional PBFT algorithm consumes a large amount of broadband resources and adversely affects data transmission. Therefore, the improved WBFT algorithm will be used to optimize the above problem.

3.2 Research on the improved WBFT blockchain sharing algorithm

Based on the traditional PBFT algorithm, a blockchain sharing algorithm (WBFT) with improved weighted Byzantine fault tolerance mechanism is proposed. The improved WBFT algorithm removes the c/s network response method under the traditional PBFT algorithm and replaces it with a point-to-point network method. It is implemented using the t-io framework in Java. At the same time, a management layer is set up at the blockchain system layer to achieve flexible control of all nodes in the system. By sending heartbeat packets regularly, system nodes can exit and join, realize dynamic perception of system nodes, and can effectively save resources. At the same time, the management layer can use the system query interface to update and maintain node weights. Figure 4 shows the blockchain data flow diagram.

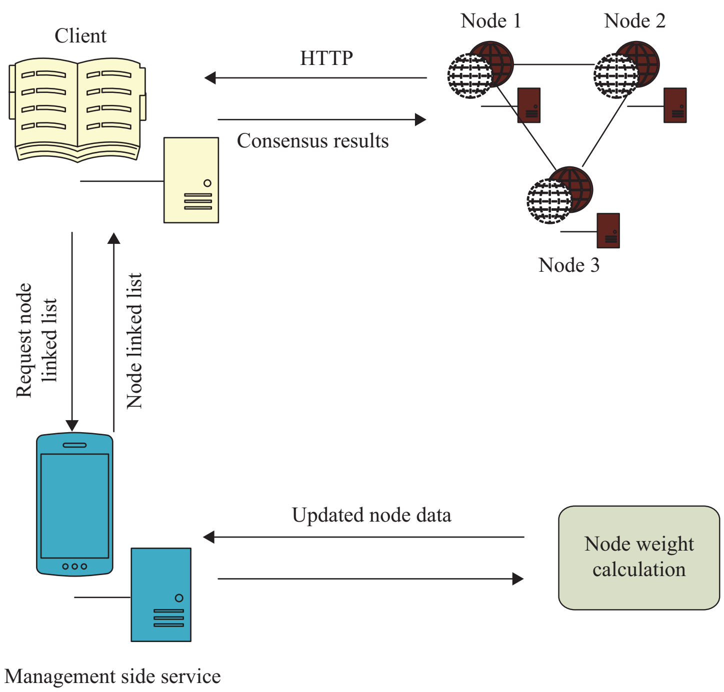

Fig. 4. Shows the blockchain data flow structure

In the traditional PBFT algorithm system, only the fault tolerance of malicious nodes is maintained, that is, in this system, the malicious nodes that agree each time will be less than 1/3 of the total number of nodes, then a correct consensus can be achieved to ensure the stable operation of the system. However, the traditional PBFT algorithm does not set up countermeasures against malicious nodes, and the timely processing of faulty nodes will affect the operating efficiency and stability of the system. In order to enhance the communication efficiency between the consortium chain nodes, a certain *N* weight is assigned to the nodes in the consensus area, and the weight of the nodes is shown in formula (2).

$$W = \{W_1, W_2 \ldots W_N\} \tag{2}$$

In formula (2), W is the weight, which represents the trust degree of the nodes in the consensus area. During the consensus process, nodes with lower weights will be restricted to reach a consensus, so as to satisfy the rapid consensus effect of the alliance chain. The weight will be dynamically adjusted according to the consensus process, and the weight will be reset before each consensus. The dynamic adjustment of weights in the consensus process can screen out malicious nodes or downtime nodes, improve the consensus efficiency of the system, and ensure the stable operation of the system.

At the end of each consensus, the system needs to adjust the weight of the node, and the adjustment of the weight mainly depends on the activity and behavior of the node to determine and adjust the weight and weight of the node. The specific process will be completed through two mechanisms: authority punishment mechanism and authority reward mechanism. In the authoritative penalty mechanism, new nodes are updated after each consensus. If the node delays receiving information, does not transmit received information, maliciously modifies information and other bad behaviors, the surrounding nodes will feedback judgment. Penalize these bad behaviors according to feedback, limit the consensus of bad nodes, set reasonable node weights for nodes according to feedback, and adjust the formula as shown in formula (3).

$$W_i = W_i - case_i \tag{3}$$

In formula (3), W_i is the node weight after a one-time consensus, which $case_i$ is the node condition.

In the authority reward mechanism, the active consensus of the node will be judged by the actual consensus time and average consensus time of the node. If the consensus time of a node is less than the average consensus time, the weight of the node can be increased in the consensus. At the same time, nodes use the feedback mechanism to report malicious nodes, and nodes can also get rewards for increasing the weight of the trade-off. Therefore, through the feedback mechanism and activities under the system, stable maintenance of nodes can be achieved. The weights are adjusted as shown in Equation (4).

$$W_i = W_i + 1 \tag{4}$$

By judging the behavior and activities of nodes and adjusting the weights of dynamic nodes, we can achieve fast and effective consensus among all nodes in the alliance chain. In the system consensus preparation stage, the improved WBFT algorithm obtains the consensus probability of each node by judging the node weight. The probability distribution of the current nodes participating in the consensus is shown in Equation (5).

$$p = \frac{W_i}{W} \tag{5}$$

In formula (5), W is the initial value of the node weight, which W_i is the current node weight. By calculating the probability of the node formula, it can effectively restrict malicious nodes from participating in the consensus, reduce the number of consensus in the system, and improve the communication effect and consensus efficiency of the system.

The traditional PBFT algorithm adopts a three-stage broadcast protocol, which leads to a large amount of network bandwidth resource consumption during the system consensus process. The consensus communication time is shown in Equation (6).

$$Total = N(2N - 1) \tag{6}$$

where (6) is the number of communications. It can be seen from equation (6) that as the number of nodes increases, the number of messages generated by node consensus increases, resulting in the consumption of a large amount of communication broadband resources. In the environment of the alliance chain, the role of each node chain is to ensure that the transaction information reaches a consensus, regardless of the ordering problem. For this, each node can reach consensus directly. Therefore, the existence of the request status has little meaning and can be deleted directly. The modified consensus time is shown in Equation (7).

$$Total = N(N - 1) \tag{7}$$

At the same time, a weight verification link, that is, a dynamic weighting mechanism verification link, is added before the pre-preparation state. For nodes with lower weights, the weight can be appropriately reduced to reduce the number of consensus nodes, so as to ensure the stable operation of the system, reduce the number of malicious nodes, ensure the communication effect of the system, and improve the stability of the entire system. The improved communication process is shown in Figure 5.

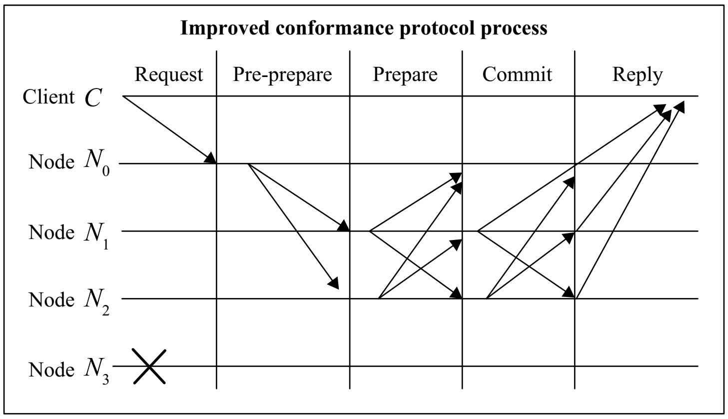

Fig. 5. Shows the improved communication process

By adjusting the authority and consensus process, if the total number of consensus is, and the number of *M* system nodes is *M*, then the number of 11 consensus communications is shown in equation (8).

$$CN = (M_{P1} + M_{P1} + M_{P1}) * Total = MN(N-1)\sum_{1}^{n} p_i \tag{8}$$

The improved waft algorithm can reduce the interference of malicious nodes to the system consensus by adjusting the weight of nodes.

Figure 6 is the block chain system structure diagram of the improved waft algorithm.

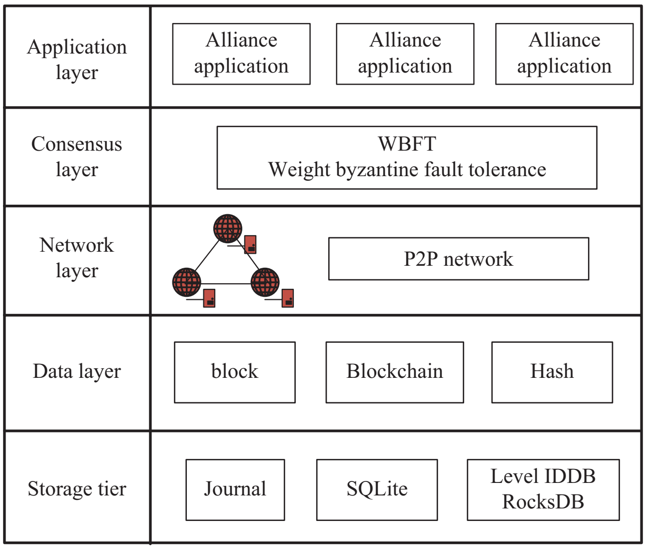

Fig. 6. Blockchain architecture of the improved WBFT algorithm

Under the blockchain system, the WBFT algorithm optimizes the third-order communication system at the same time, removes the request state memory, adds a weight verification link before the pre-preparation state, and builds a blockchain system. Figure 7 is the flow chart of the blockchain system.

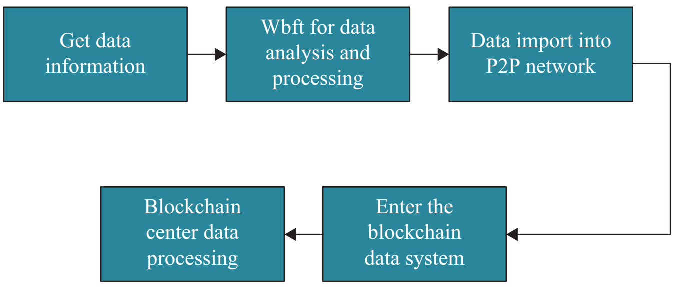

Fig. 7. Is a flow chart of the blockchain system

4 Experimental test of blockchain resource sharing algorithm

To test the performance of the proposed algorithm on data sharing, a blockchain system will be built on Windows and Linux platforms, including six computers and several virtual machine nodes. The experimental test platform is based on the server side of the alliance chain, and will test the performance of the algorithm's consensus delay, throughput, fault-tolerant security and other indicators. Add reputation value Byzantine Fault Tolerance (Robust Byzantine Tolerance, RBFT) and parallel Byzantine Fault Tolerance (Concurrent Byzantine Fault Tolerance, CBFT) to participate in performance comparison. In the consensus latency performance test, 0s to 10s are equally divided into two levels as the generation time of new blocks. As shown in Figure 8, the consensus latency results of the four algorithms are shown.

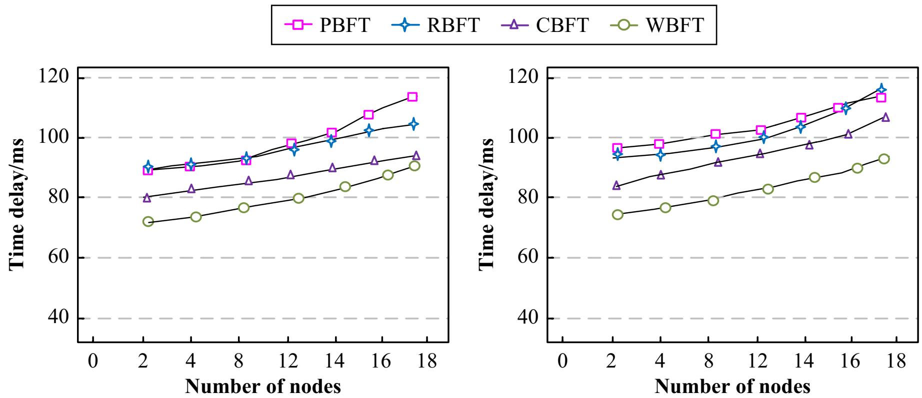

Fig. 8. Consensus delay results of four algorithms

Figure 8 shows the consensus latency results for the four algorithms. In Figure 8 (a), in the consensus latency performance test with a blocking time of 5S, the test results of the four algorithms are significantly worse. It can be seen that with the continuous increase of the number of nodes, the consensus delay time of the four algorithms increases, and the delay performance decreases. Meanwhile, when the number of nodes of PBFT algorithm, RBFT algorithm, CBFT algorithm and WBFT algorithm is 18, the delays are 112ms, 105ms, 93ms and 90ms respectively. It can be seen that the latency performance of the proposed improved WBFT algorithm is the best; in Figure 8 (b), in the consensus latency performance test with a blocking time of 10s, the consensus latency also increases with the number of nodes. When the number of nodes for the four algorithms is 18, the delays are 116ms, 118ms, 108ms and 94ms, respectively. It can be seen that in the 10s test, the improved WBFT algorithm still has the best delay performance and the shortest delay time, and can obtain better data transmission performance.

Considering the influence of the generation time of new blocks on the latency performance of the algorithm, the latency results of the algorithm in four cycles of 10–30s are tested, as shown in Table 1.

Table 1. Algorithm delay results under the fast time of 10–30 seconds

Algorithm Type		4	8	12	16	Average Latency/ms
		Node Latency	Node Latency	Node Latency	Node Latency	
15s	PBFT	113 ms	116 ms	121 ms	123 ms	126 ms
	RBFT	112 ms	116 ms	120 ms	122 ms	124 ms
	CBFT	106 ms	112 ms	116 ms	118 ms	120 ms
	WBFT	100 ms	104 ms	106 ms	108 ms	110 ms
20s	PBFT	114 ms	118 ms	123 ms	126 ms	128 ms
	RBFT	113 ms	117 ms	122 ms	124 ms	126 ms
	CBFT	109 ms	115 ms	119 ms	121 ms	125 ms
	WBFT	106 ms	106 ms	110 ms	110 ms	113 ms
25s	PBFT	120 ms	122 ms	126 ms	129 ms	131 ms
	RBFT	118 ms	120 ms	124 ms	127 ms	129 ms
	CBFT	116 ms	118 ms	122 ms	126 ms	127 ms
	WBFT	110 ms	113 ms	116 ms	118 ms	121 ms
30s	PBFT	126 ms	128 ms	131 ms	136 ms	142 ms
	RBFT	120 ms	125 ms	129 ms	130 ms	138 ms
	CBFT	119 ms	123 ms	126 ms	128 ms	136 ms
	WBFT	116 ms	118 ms	123 ms	126 ms	129 ms

Table 1 shows the algorithm latency results for fast times of 10–30 seconds. It can be seen that as the rapid generation time increases, the algorithm consensus delay time becomes longer, and the consensus delay performance decreases. An increase in the rapid generation time means an increase in transaction information during that time, resulting in a blockage of the system consensus and an increase in time. Meanwhile, in the experimental test, if the number of transaction information is fixed and the time of the same block is set, the experimental test is repeated 15 times. The experimental results are shown in Figure 9.

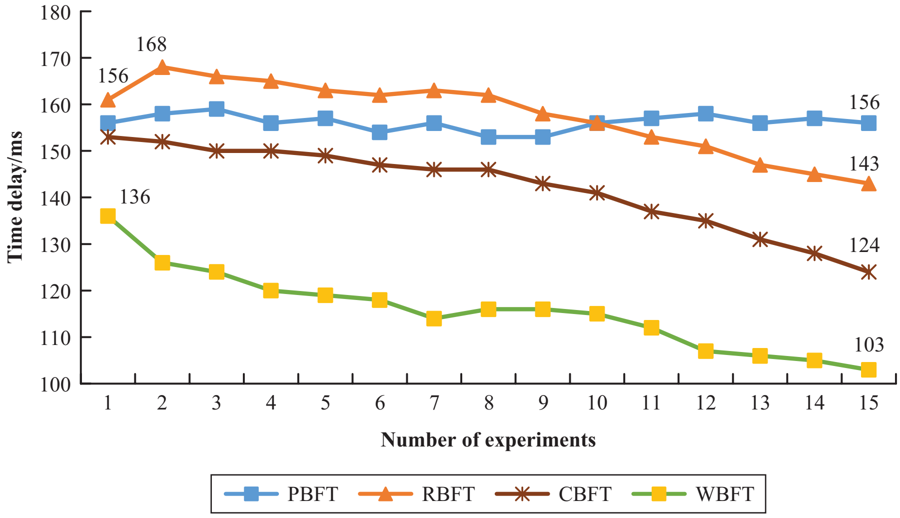

Fig. 9. Shows the consensus experimental results of 15 repeated experimental tests

Figure 9, the consensus mechanism is optimized. As the number of consensus increases, the consensus delay time of the proposed improved WBFT algorithm gradually decreases, and the optimal consensus delay time of 103ms is obtained. At the same time, the consensus delay performance of the RBFT algorithm and the CBFT algorithm is improved. After 15 consensuses, 143ms and 124ms, respectively. However, the performance of the traditional PBFT algorithm does not change significantly with the increase of the consensus times, which shows that the increase of the consensus times has less impact on the traditional PBFT algorithm. Set the block time to 5s, 10s, 15s and 20s to test the average throughput of the algorithm. The experimental results are shown in Figure 10.

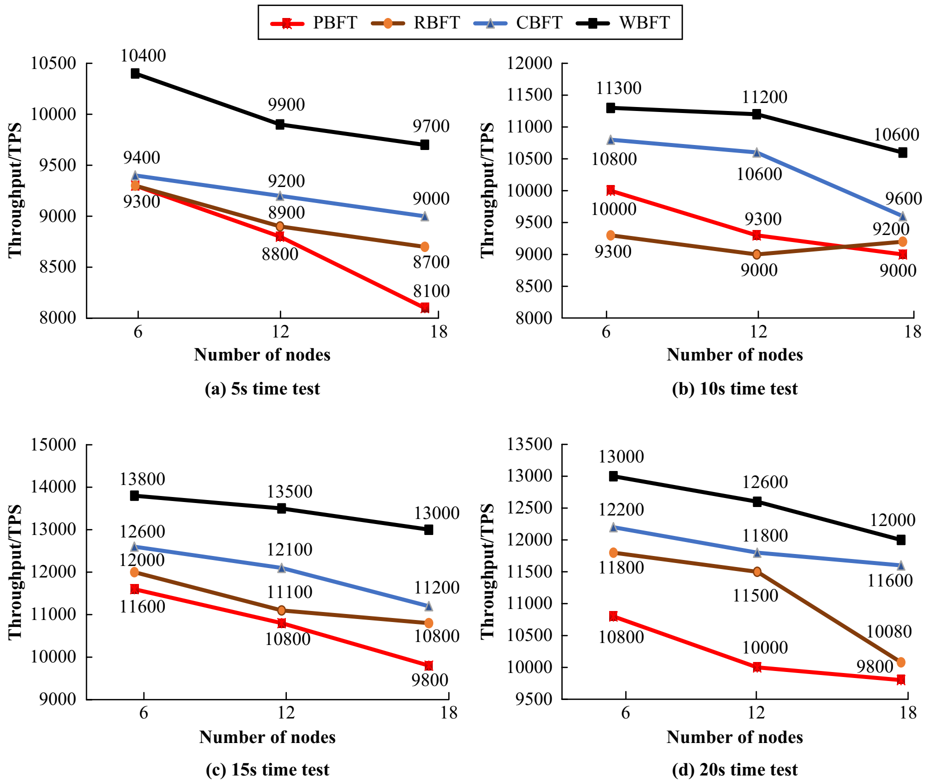

Fig. 10. Shows the throughput test results for each algorithm

Figure 10 shows the average throughput test results for different algorithms. It can be seen that different block times have a great impact on the average throughput test of the algorithm. From Figure 10 it can be seen that the average throughput performance of each algorithm degrades significantly as the number of nodes increases. In Figure 10 (a), the blocking time is 5S. When the number of nodes is 6, the average throughput of PBFT algorithm, RBFT algorithm, CBFT algorithm and WBFT algorithm are 9300tps, 9300tps, 9400tps and 10400tps respectively; when the number of nodes is 18, PBFT algorithm, RBFT algorithm, CBFT algorithm and WBFT algorithm. The average throughputs are 8100tps, 8700tps, 9000tps and 9700tps, respectively. It can be seen that as the number of nodes increases, the average throughput performance of each algorithm decreases. However, the proposed improved algorithm performs the best in the throughput performance test; a comprehensive comparison of the four algorithms is also carried out. The average throughput of WBFT algorithm is 20.2% higher than PBFT algorithm, 15.6% higher than RBFT algorithm, and 5.6% higher than CBFT algorithm. It can be seen that the performance of the proposed algorithm is excellent. At the same time, the experimental test was repeated 15 times. The experimental results are shown in Figure 11.

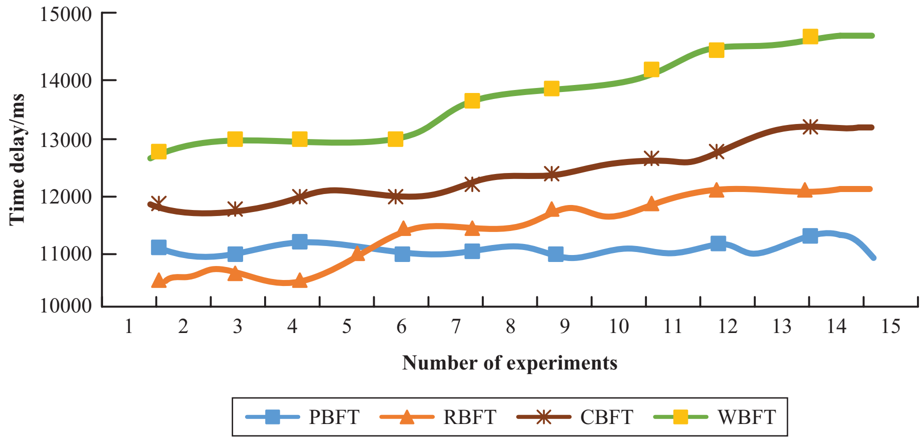

Fig. 11. Multi-algorithm throughput test results

Figure 11 shows the average throughput results for various algorithms. As the number of consensus increases, the throughput of the RBFT, CBFT, and WBFT algorithms all increase. At the first consensus, the throughputs of the RBFT algorithm, CBFT algorithm and WBFT algorithm were 4000tps, 11800tps and 12900tps respectively. With the increase of consensus times, the throughput performance of each algorithm improves and tends to stabilize at 15 consensus training times. The swallowing capabilities of RBFT algorithm, CBFT algorithm and WBFT algorithm are 11800tps, 12900tps and 14800tps respectively. However, the increase of consensus times has little effect on the performance of the traditional PBFT algorithm. Therefore, it can be seen that the proposed algorithm performs the best in the average throughput performance test. Finally, test the security of the algorithm, reach a consensus on 15 pieces of transaction information, and count the proportion of malicious behavior in the system. The experimental results are shown in Figure 12.

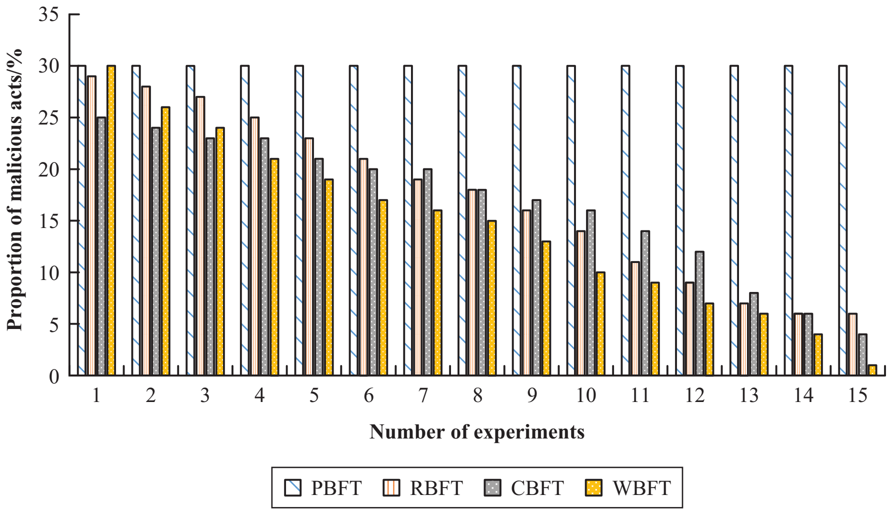

Fig. 12. The proportion of malicious behavior of various algorithms

Figure 12 shows the malicious behavior test results. It can be seen that with the increase of consensus times, the average malicious behavior rate of WBFT algorithm, CBFT algorithm and RBFT algorithm will gradually decrease. When consensus was reached 15 times, the malicious behavior rates were 1%, 4%, and 6%, respectively. However, the traditional BPFT algorithm does not change the malicious behavior rate as the number of consensus increases. It can be seen that the proposed WBFT algorithm has better performance in reducing the probability of malicious behavior of the system. The experimental tests of the consensus delay performance, throughput performance and security of the four algorithms show that the proposed WBFT algorithm has excellent performance and meets the reliability, security, delay and data throughput requirements of resource data sharing. Therefore, the improved WBFT algorithm has better performance for building a music teaching resource sharing platform using blockchain technology, and meets the requirements of modern education development.

5 Conclusion

Blockchain technology has unique advantages in the field of data and information security, which can ensure the safe sharing and efficient transmission of data and information. In the construction of the online music teaching resource sharing platform, the traditional blockchain PBFT algorithm consensus allows 1/3 of the cheating points in the blockchain, and the authentication transaction is confirmed by the confirmation mechanism to realize the safe transmission of data. However, the traditional pbft algorithm has problems such as low data throughput, large delay, and inefficient node joining and exiting mechanisms. Therefore, an improved WBFT algorithm is proposed based on the PBFT algorithm, which restricts the system consensus nodes by increasing the weight mechanism. After the consensus, the node behavior will dynamically adjust the weight to improve the system stability. The experimental results show that the improved WBFT algorithm has the best latency performance in the consensus latency performance test. When the block time is 5S and the number of nodes is 18, the delays of BFT, RBFT, CBFT and WBFT are 112ms, 105ms, 93ms and 90ms, respectively. The improved algorithm has the best latency performance. Meanwhile, the performance of the improved WBFT algorithm is the best in throughput and security tests. Therefore, the blockchain sharing algorithm proposed in this paper meets the requirements of building an online music resource sharing platform and can achieve excellent performance. However, there are also shortcomings in the research content. The blockchain consensus algorithm is proposed to ensure the security and stability of online music platform data. However, the proposed algorithm does not consider the impact of long-term operation of a large number of logs on system information security, and needs to be improved in the future.

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