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Branch: Data Science

1. H. Kim, H. Noh, H. Song and G. S. Park, "Quick Block Transport System for Scalable Hyperledger Fabric Blockchain Over D2D-Assisted 5G Networks," in IEEE Transactions on Network and Service Management, vol. 19, no. 2, pp. 1176-1190, June 2022, doi: 10.1109/TNSM.2021.3122923.

i)

1. Combine mobile edge cloud and mobile diveces with Hyperledger Fabric blockchain to implement a scalable blockchain.
2. Improve block dissemination to be faster
3. Design a module of mobile devices which has a quick transport feature.
4. Verify the performance of block transport system with Hyperledger Fabric blockchain and OpenAirInterface

ii)

1. Hyperledger Fabric blockchain 2. D2D-Assisted 5G Networks 3. mobile edge cloud 4. OpenAirInterface

iii)

1. Distribute the Hyperledger Fabric blockchain between mobile edge cloud and mobile device to ensure the scalability.
2. One of the main factors that affecting scalability is the block dissemination delay.
3. Hyperledger Fabric blockchain is a highly scalable blockchain.
4. Public blocchain has relatively low scalability
5. Lei, M. Du, J. Huang and T. Jin, "Groupchain: Towards a Scalable Public Blockchain in Fog Computing of IoT Services Computing," in IEEE Transactions on Services Computing, vol. 13, no. 2, pp. 252-262, 1 March-April 2020, doi: 10.1109/TSC.2019.2949801.

i)

1. Design a two-chian structure blockchain called Groupchain with high transaction efficiency.
2. Increase bonus into incentive mechanism to prevent joint attacks.
3. Verify the Groupchain’s security
4. Verify the Groupchain’s improvement on transaction.

ii)

1. Internet of Things 2. Fog computing 3. Groupchain 4. Bitcoin-NG

iii)

1. Fog computing combined with blockchain has some scalability challenges like limited transaction efficiency.
2. Fog computing also suffer from a scalability problem as supporting a lot of fog nodes.
3. Groupchain is a scalable two-chain structure blockchain.
4. Bitcoin-NG is a scalable blockchain.