Call for Papers: IEEE Transactions on Network Science and Engineering

Special Issue on "Blockchain in Future Networks and Vertical Industries"

Blockchain has been successfully applied to a number of sectors, including financial, energy, logistics and supply chains sectors, due to its ability of creating a tamper-proof digital ledger of transactions and the resulting novel trust mechanisms. Network slicing is a promising technology in 5G and future networks to meet the diversified requirements of different vertical industry services. To form a network slice, a certain number of virtualized network functions (VNF) need to be chained under the constraints of service requirements, e.g., ultra-reliable low latency communications and massive machine-type communications. The VNFs of a network slice can be dynamically updated, added and released according to the dynamic change of service requirements. Since public APIs will be available to users, the orchestration process and the management of a network slice need to be highly secure and trusted; especially when the network slice is used to accommodate ultra-high-security applications, e.g., remote robotic surgery. In addition, future networks will be the heterogeneous networks connected together by satellite network, 5G, the Internet, ocean-based networks (supporting networking and communications in ocean), and so on; security and trust management is a major issue in such kind of future networks. Blockchain technology is a promising solution to achieve the desired level of security and trustworthiness in the above scenarios. However, the application of blockchain technology in 5G, vertical industries and future heterogeneous networks is still in its infancy. Many challenging issues need to be resolved before its application can be deployed in real-world networking environment, e.g., high-performance blockchain and decentralized schemes for future networks and vertical industries, lightweight security solution, efficiency and availability of blockchain system, etc.

This special issue is devoted to reporting the most recent developments and research outcomes addressing the related theoretical and practical aspects on network science and engineering issues of the blockchain in future networks and vertical industries. The issue aims to provide worldwide researchers and practitioners an ideal platform to report on innovative new solutions targeting the corresponding key challenges. Topics of interest include but are not limited to the following:

- Architecture of blockchain in future networks for vertical industry services
- Network science for blockchain in future networks and vertical industries
- Engineering issues for blockchain in 5G/future networks and vertical industries
- Smart contract and distributed ledger for future networks and vertical industries
- Security, privacy and trust of blockchain and decentralized schemes
- Performance optimization of blockchain and decentralized schemes
- Lightweight protocols and algorithms based on blockchain in 5G and vertical industries
- Blockchain based lightweight data structures
- Attacks on blockchain based systems
- Blockchain and next generation and heterogeneous network security
- Blockchain based user authentication and secure routing

Prospective authors are invited to submit their manuscripts electronically through the online system (https://mc.manuscriptcentral.com/tnse-cs) and select the correct special issue. Please make sure to adhere to the Transactions guidelines with the same page limit as regular papers

(http://www.computer.org/portal/web/TNSE/author). Submissions should not be published or currently under review by another conference or journal.

Important Dates

- Manuscripts due: September 1, 2019
- Peer reviews to authors: January 1, 2020
- Revised manuscripts due: February 15, 2020
- Second-round reviews to authors: March 15, 2020
- Final accepted manuscript due: April 15, 2020

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