

## cybersecurity risk management of blockchain networks

A blockchain is, in the simplest of terms, a time-stamped series of immutable record of data that is managed by a cluster of computers not owned by any single entity. Each of these blocks of data is secured and bound to each other using cryptographic principles.

The blockchain network has no central authority. Since it is a shared and immutable ledger, the information in it is open for anyone and everyone to see. Hence, anything that is built on the blockchain is by its very nature transparent and everyone involved is accountable for their actions.

Due to the nature of blockchain, implementing distributed ledger technology also introduces new and specific risks that do not exist in more traditional centralized systems. This raises the question of whether new blockchain implementations will be sufficiently in control when moving from the proof-of-concept phase to production.

In this paper, we follow the procedure, which we've implemented in previous labs, to develop a cyber risk management plan for blockchain networks. Therefore, we would be able to showcase the risks in a general blockchain network and the corresponding controls.

- [1] D. T. T. Anh, M. Zhang, B. C. Ooi and G. Chen, "Untangling blockchain: A data processing view of blockchain systems," *IEEE Transactions on Knowledge and Data Engineering*, vol. PP, no. 99, pp. 1–1, 2018.
- [2] M. Conti, C. Lal, S. Ruj et al., "A survey on security and privacy issues of bitcoin," *arXiv preprint arXiv:1706.00916*, 2017.
- [3] L. Ghiro, L. Maccari and R. L. Cigno, "Proof of networking: Can blockchains boost the next generation of distributed networks?" in *2018 14th Annual Conference on Wireless On-demand Network Systems and Services (WONS)*, Feb. 2018, pp. 29–32.
- [4] A. Marotta, F. Martinelli, S. Nanni, A. Orlando and A. Yautsiukhin, "Cyber-insurance survey," *Computer Science Review*, vol. 24, pp. 35 – 61, 2017.
- [5] AWS, "Aws blockchain partners," <https://aws.amazon.com/cn/partners/blockchain/>.
- [6] F. Tschorsch and B. Scheuermann, "Bitcoin and beyond: A technical survey on decentralized digital currencies," *IEEE Communications Surveys Tutorials*, vol. 18, no. 3, pp. 2084–2123, third quarter 2016.
- [7] H. Wang, K. Chen and D. Xu, "A maturity model for blockchain adoption," *Financial Innovation*, vol. 2, no. 1, pp. 12, 2016.
- [8] J. Garay, A. Kiayias and N. Leonardos, "The bitcoin backbone protocol: Analysis and applications," in *Advances in Cryptology - EUROCRYPT 2015: 34th Annual International Conference on the Theory and Applications of Cryptographic Techniques, Part II*, Sofia, Bulgaria, Apr. 2015, pp. 281–310.
- [9] I. Eyal, A. E. Gencer, E. G. Sirer and R. Van Renesse, "Bitcoin-ng: A scalable blockchain protocol," in *NSDI*, 2016, pp. 45–59.
- [10] S. Nakamoto, "Bitcoin: A peer-to-peer electronic cash system. bitcoin," 2009.