RESEARCH ARTICLE | NOVEMBER 02 2023

Establishing trust enhanced blockchain-based distributed web service registry

S. Sridevi ; G. R. Karpagam; B. Vinoth Kumar

+ Author & Article Information
AIP Conf. Proc. 2917, 060004 (2023)
https://doi.org/10.1063/5.0175642

The W3C typically describes web services as: “a piece of software that is designed to support machine-to-machine interoperability over a network. With the rapid expansion of functionally similar web services over the internet exposes a great challenge for users to identify the web service origin and integrity process. A traditional centralized web service registry drastically shifts the dynamic power of web services, by establishing a platform for service provider”s to advertise their self-contained, self-reliable and self-governing data. Though, these centralized infrastructures do not offer easy way to explore available services for users in thenetwork, and also nor have the ability to verify their origin and history. The contribution of the paper is to address these challenges by leveraging the decentralized, immutable, tamper-proof Blockchain technology by establishing Blockchain service registry and execution via smart contract for secured semantic web service discovery. This allows users to explore the services in a network and also able to identify its service origin and integrity. Our first evaluation shows the promising results with this system paradigm in the field of web service provisioning.

Topics
Telecommunication networks, **Theoretical computer science**, **Information and communication theory**, **Semantic web**

REFERENCES

1. Roseli Persson Hansen, Cassia T. Santos, Sérgio Crespo, S. Pinto, Guilherme L. Lanius, Fernando Massen, “*Web Services: An Architectural Overview*”, Retrieved from - http://projeto.unisinos.br/webcomposej/Artigos/webservices.pdf on August 2022.

2. Demetra Edwards, Karolina Kiwak, and Geoffrey Bock, *Web content management system (WCMS)*, retrieved from: https://searchcontentmanagement.techtarget.com/definition/web-content-management-WCM, on August 2022.

3. P. Hogg, M. Chilcott, and B. Srinivasan, An Evaluation of Web Services in the Design of a B2B Application, 27th Australasian Conferences in Research and Practice in Information Technology, Vol. 26, pp. 331–340.

4. United states trade representative executive office of president, 2019 *Review of Notorious Markets for Counterfeiting and Piracy*, Retrieved from https://ustr.gov/sites/default/files/2019_Review_of_Notorious_Markets_for_Counterfeiting_and_Piracy.pdf on August 2022.

5. CSO India, *Pharming explained: How attackers use fake websites to steal data*, Retrieved from - https://www.csoonline.com/article/3537828/pharming-explained-how-attackers-use-fake-websites-to-steal-data.html on August 2022.

6. Imperva, *Domain name server (DNS) Hijacking*, retrieved form: https://www.imperva.com/learn/application-security/dns-hijacking-redirection/, on August 2022.

7. Z. Zheng, S. Xie, H. Dai, X. Chen, and H. Wang, An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends, *IEEE International Congress on Big Data*, pp. 557–564 (2017).
Google Scholar

8. A. Kosba, A. Miller E. Shi, Z. Wen, and C. Papamanthou, The Blockchain Model of Cryptography and Privacy-Preserving Smart Contract. *IEEE Symposium on Security and Privacy (SP)*, pp. 839–858