



















certificates obtained by a CA that we measure its trustworthiness. According to [15], granting a certificate by a trustworthy CA for another CA implicates that the issuer CA places certain trust in it. In this sense, we will assess this implicit trust in accordance with the issued certificate extensions fields, which will be discussed in detail in a future paper. Thus, we evaluate CA trustworthiness depending on their certificates issued by the other trusted CAs. This new trust evaluation process for a CA will be added to the previous one. That will improve the TLoCA computation when getting a low number of CHs. On the other hand, we will describe in detail a translation process of CP document into XML format in a future paper. Finally, we will improve our approach and assess its effectiveness in our experimental.

## 8. References

- [1] I.Symeonidis, F.Beato, and B. Preneel, “fRiendTrust: A Privacy Preserving Reputation System for Online Social Networks”, in Proceedings of the IFIP Information and Communication Technology, Springer-Verlag, 2014, p.17.
- [2] A. Jøsang, R.Ismail, and C.Boyd, “A Survey of Trust and Reputation Systems for Online Service Provision”, Decision Support Systems journal, Elsevier Science, March 2007, pp. 618-644, .
- [3] C.Cheshire, “Online Trust, Trustworthiness, or Assurance?”, Daedalus, MIT Press Journals, Septembere 2011, pp. 49-58
- [4] J.Audun, “PKI trust models”, Theory and Practice of Cryptography Solutions for Secure Information Systems, IGI Global, 2013, pp. 279-301
- [5] A. Jøsang, “The right type of trust for distributed systems”, in Proceedings of the New Security Paradigms Workshop (NSPW), ACM, 1996.
- [6] L.Mui, M.Mohtashemi, A.Halberstadt, “A computational model of trust and reputation”, In Proceedings of the 35th Hawaii International Conference on System Sciences, 2002, pp. 2431-2439.
- [7] R.C.Mayer, J. H.Davis, and F.D.Schoorman, “An integrative model of organizational trust”, Academy of Management Review, Academy of Management, vol.20,1995, pp. 709–734.
- [8] A.Josang, “Trust and Reputation Systems”, Foundations of Security Analysis and Design IV (FOSAD), Springer Berlin Heidelberg, Bertinoro, Italy, September 2007, pp. 209–245.
- [9] H. Jingwei, and N. David. “A calculus of trust and its application to PKI and identity management,” In IDtrust, ACM New York, 2009, pp.23-27.
- [10] C.Jiska, B.Johannes, V.Florian, H. Matthias, and M .Max, “A Distributed Reputation System for Certification Authority Trust Management,” 14th IEEE International Conference on Trust, Security and Privacy in Computing and Communications (IEEE UbiSafe Symposium), Finland, 2015, pp.1349 – 1356.
- [11] J.Braun, F.Volk, J.Buchmann, and M.Mühlhäuser, “Trust views for the web PKI,” In Public Key Infrastructures, Services and Applications, Springer, 2014, Vol 8341, pp.134–15.
- [12] V.Hawanna, V. Y. Kulkarni, R. A. Rane, P. Mestri, S. Panchal, “Risk Rating System of X.509 Certificates”, 12<sup>th</sup> International Multi-Conference on Information Processing-2016 (IMCIP-2016), Bangalore, India, 2016, pp.152-161.
- [13] S.Anooshiravan, M.U.Janjua, N.Porter, P. Hallin, H.Li, X.Su, K.Yiu, A.P.Penta, V.D.Bakalov, B.M.Nitta, “Advising Clients about Certificate Authority Trust,” patent application at Politics & Government Week, February 25, 2016.
- [14] L.Gonc, A.Martins and R.F.Custodio, “Implementation of Trust Metrics in X.509 Public Key Infrastructure”, The Seventh International Conference on Emerging Security Information, Systems and Technologies, Barcelona, Spain August 2013, pp.25 – 31.
- [15] H.El Bakkali and B.I. Kaitouni, “A predicate calculus logic for the PKI trust model analysis”, IEEE International Symposium on Network Computing and Applications, IEEE, 2001, pp.368 – 371,
- [16] J.M.Lucas and M.S.Saccucci, “Exponentially weighted moving average control schemes: properties and enhancements”, Technometrics, Taylor & Francis, Ltd., USA, 1990, vol. 32, pp.1-12.
- [17] V.V.Rajendran, and S.Swamynathan, “Hybrid model for dynamic evaluation of trust in cloud services,” Wireless Networks, Springer, 2015, pp. 1-12,
- [18] D.I.Glen, (1992) “Determining sample size”, <http://www.sut.ac.th/im/data/read6.pdf>
- [19] S.Chokhani, W.Ford, R.Sabett, C.Merrill, and S.Wu, “RFC 3647: internet X.509 public key infrastructure certificate policy and certification practices framework”, Nov 2003.
- [20] V. Casola, A. Mazzeo, N. Mazzocca and M. Rak, “An innovative policy-based cross certification methodology for public key infrastructures”, Public Key Infrastructure, Springer, 2005.