

A Communication Security Protocol for Ubiquitous Sensor Networks

Mangal Sain, Ndibanje Bruce, Ki Hwan Kim, Hoon Jae Lee

Department of Computer Engineering, Dongseo University, Busan, South Korea

mangalsain1@gmail.com, bruce.dongseo.korea@gmail.com, gend90@gmail.com, hjlee@dongseo.ac.kr

Abstract— The data accessibility anytime and anywhere is nowadays the key feature for information technology enabled by the ubiquitous network system for huge applications. However, security and privacy are perceived as primary obstacles to its wide adoption when it is applied to the end user application. When sharing sensitive information, personal s' data protection is the paramount requirement for the security and privacy to ensure the trustworthiness of the service provider. To this end, this paper proposes communication security protocol to achieve data protection when a user is sending his sensitive data to the network through gateway. We design a cipher content and key exchange computation process. Finally, the performance analysis of the proposed scheme ensure the honesty of the gateway service provider, since the user has the ability to control who has access to his data by issuing a cryptographic access credential to data users.

Keyword— Communication Protocol, Gateway, Access Credential, Security, Privacy



Mangal Sain received the M.Sc. degree in computer application from India in 2003 and the Ph.D. degree in computer science in 2011. Since 2012, he has been an Assistant Professor with the Department of Computer Engineering, Dongseo University, South Korea. His research interest includes wireless sensor network, cloud computing, Internet of Things, embedded systems, and middleware. He has authored over 30 international publications including journals and international conferences. He is a member of TIIS and a TPC member in several international conferences



Bruce Ndibanje received the B.Sc degree in Computer Sciences, from Ngozi University, Burundi in 2006, the MS degree in Ubiquitous IT from Dongseo University in 2013. He has worked with many companies in the ICT domain such Huawei, United Nations, and Econet Wireless Burundi. Currently he is a Doctorate Researcher member of the Cryptography and Network Security Lab at Dongseo University, Busan, Korea since 2013. His research interest includes Wireless and Sensor Networks, Authentication Protocol, Security in: e-Healthcare System, Cloud Computing and Cellular Networks, Side-channel attack and Countermeasures. He is a member of the IEEE Computer Society.



Ki Hwan Kim

2013: BS at Dongseo University, Republic of Korea

2015: MS at Dongseo University, Republic of Korea

2015 ~ current: doctor's course Dongseo University, Republic of Korea

Research Interests: Wireless Sensor Networks, Cryptography and Network Security, Side Channel Analysis



Hoon-Jae Lee received his BS, MS, and PhD. degrees in Electrical Engineering from Kyungpook National University, Daegu, South Korea, in 1985, 1987, and 1998, respectively. He is currently a professor in the Department of Information and Communication Engineering at Dongseo University. From 1987 to 1998, he was a research associate at the Agency for Defense Development (ADD). His current research interests include developing secure communication system, side-channel attack, and ubiquitous sensor network/radio frequency identification security.