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Storage Security in Cloud Computing

Cloud storage has great potential of providing data owners with on-demand scalable storage services at reduced cost. By outsourcing massive storage in cloud, data owners can be relieved from the burden of local hardware and software management. However, the fact that owners no longer have physical possession of the outsourced data obsoletes traditional cryptographic primitives for storage correctness protection. Hence, enabling efficient storage correctness auditing in the cloud environment with new approaches becomes imperative and challenging. Furthermore, the outsourced data may not be static in nature and may be accessed and dynamically updated as needed later on. Thus, incorporating data dynamics is also inherently demanded by any practical storage auditing solution, which makes the solution design even more challenging. As storage-auditing schemes normally require data owners to check the cloud data periodically to maintain correctness guarantee, it still imposes cumbersome computation and online burdens from data owners' perspective. One effective solution to this would be introducing a third-party auditor (TPA) to perform regular auditing tasks on behalf data owners. Enabling public auditability can save not only owners' computation and on-line overheads but also provide a means for fair assessment of cloud storage service risks. The further involved design challenge is that introducing a TPA should not bring in any privacy breach against owner's data when allowing the TPA to perform auditing tasks. In this talk, I will present a few recent research efforts on storage security in cloud computing that tackle the above-mentioned issues. I will also discuss some other security research issues in the context of cloud

Biography: Dr. Kui Ren is currently an Assistant Professor of Electrical and Computer Engineering Department at the Illinois Institute of Technology. Kui received his Bachelors and Masters Degrees from Zhejiang University in 1998 and 2001, respectively and his PhD in Electrical and Computer Engineering from Worcester Polytechnic Institute in 2007. Kui's research interests include Security & Privacy in Cloud Computing, Lower-layer Attack & Defense Mechanisms for Wireless Networks, Smart Grid Security, and Sensor & Mesh Network Security. He currently leads the Ubiquitous Security & Privacy Research Laboratory at IIT, and his research is supported by US National Science Foundation, US Department of Energy, US Air Force Research Laboratory, and Amazon Web Service. Kui has published extensively in ACM/IEEE transactions, journals, and premier conferences. Kui is the guest editor of IEEE Transactions on Smart Grid, the Special Issue on Cyber, Physical and System Security for Smart Grid. He also serves as a TPC member for many IEEE and ACM conferences.

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