NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

C S   S E M I N A R

Title: **A Secure Data Sharing and Query Processing Framework via Federation of Cloud Computing**

Speaker: Prof. Sanjay K Madria
            Professor and Site Director, NSF Industry/University Center
            on Net-centric Software and Systems
            Department of Computer Science
            Missouri University of Science and Technology, Rolla, MO

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Venue: MR1, COM1-03-19

Chaired by: Dr Tan Kian Lee, Shaw Senior Professor, School of Computing
            (tankl@comp.nus.edu.sg)

Abstract:

Due to cost-efficiency and less hands-on management, big data owners are outsourcing their data to the cloud, which can provide access to the data as a service. However, by outsourcing their data to the cloud, the data owners lose control over, as the cloud provider becomes a third party service provider. At first, encrypting the data by the owner and then exporting it to the cloud seems to be a good approach.
However, there is a potential efficiency problem with the outsourced encrypted data when the data owner revokes some of the users' access privileges. An existing solution to this problem is based on symmetric key encryption scheme but it is not secure when a revoked user rejoins the system with different access privileges to the same data record.
In this talk, I will discuss an efficient and Secure Data Sharing (SDS) framework using a combination of homomorphic encryption and proxy re-encryption schemes that prevents the leakage of unauthorized data when a revoked user rejoins the system. I will also discuss the modifications to our underlying SDS framework and present a new solution based on the data distribution technique to prevent the information leakage in the case of collusion between a revoked user and the cloud service provider.
A comparison of the proposed solution with existing methods will be discussed in detail. Furthermore, I will outline how the existing work can be utilized in our proposed framework to support secure query processing for big data analytics. I will provide a detailed security as well as experimental analysis of the proposed framework on Amazon EC2 and highlight its practical use.

Biodata:

Sanjay Kumar Madria received his Ph.D. in Computer Science from Indian Institute of Technology, Delhi, India in 1995. He is a full professor in the Department of Computer Science at the Missouri University of Science and Technology (formerly, University of Missouri-Rolla, USA) and site director, NSF I/UCRC center on Net-Centric Software Systems.

He has published over 200 Journal and conference papers in the areas of mobile data management, Sensor computing, and cyber security and trust management. He won three best papers awards including IEEE MDM 2011 and IEEE MDM 2012. He is the co-author of a book published by Springer in Nov 2003. He serves as a steering committee member in IEEE SRDS and IEEE MDM among others and has served in International conferences as a general co-chair (IEEE MDM, IEEE SRDS and others), and presented tutorials/talks in the areas of mobile data management and sensor computing at various venues. His research is supported by several grants from federal sources such as NSF, DOE, AFRL, ARL, ARO, NIST and industries like Boeing, Unique*Soft etc. He was awarded JSPS (Japanese Society for Promotion of Science) visiting scientist fellowship in 2006 and ASEE (American Society of Engineering Education) fellowship at AFRL from 2008 to 2012. In 2012-13, he was awarded NRC Fellowship by National Academies. He received faculty excellence research awards in 2007, 2009, 2011 and 2013 from his university for excellence in research given every 2 years. He served as an IEEE Distinguished Speaker, and currently, he is an ACM Distinguished Speaker and IEEE Senior and Golden Core Member.