MISSOURI S&T University of Science & Technology

Seminar Series
Comp. Sci. Dept.

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Risk Assessment using Bayes Graphs

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Feb 28th Tuesday, 12:30 to 1:30pm

Venue – CS 209

Abstract - Security risk assessment and mitigation are two vital processes that need to be executed to maintain a productive IT infrastructure. On one hand, models such as attack graphs and attack trees have been proposed to helps ITs identify flaws in the design such as '*fail to place authentication where/when it is needed*' -- the flaw which traditional security best practices such as standard compliance and patch management cannot manage. On the other hand, different decision problems have been explored to identify the minimum-cost hardening measures. However, these risk models do not help reason about the causal dependencies between network states. Further, the optimization formulations ignore the issue of resource availability while analyzing a risk model. In this paper, we propose a risk management framework using Bayesian networks that enable a system administrator to quantify the chances of network compromise at various levels. We show how to use this information to develop a security mitigation and management plan. In contrast to other similar models, this risk model lends itself to dynamic analysis during the deployed phase of the network. A multi-objective optimization platform provides the administrator with all trade-off information required to make decisions in a resource constrained environment.

Brief Bio - Nayot Poolsappasit received his Ph.D. from Colorado State University in 2010. He is currently a post doctoral research fellow at the Missouri University of Science and Technology. He performs scientific research in security risk assessment and trusted computing in sensor networks. His current research interests include sensor-cloud services, trusted data aggregation, and identity and access management in virtual sensor networks. He is a member of the IEEE.