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STOCHASTIC ANALYSIS OF WORM PROPAGATION IN COMPUTER NETWORKS

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Abstract

Computer worms are self replicating, quickly evolving and self-spreading malicious codes through the Internet similar to the spread of infectious diseases in human population. An improved mathematical model is developed to predict the rate and extent of propagation of a computer worm infection using a biological epidemic analogy. The availability of reliable models of worm propagation would prove in predicting future threats, and developing new containment measures. Modeling the spread of active worms can help us understand how active worms spread, and how we can monitor and defend against the propagation of worms effectively. In this paper, the authors analyse the propagation of worms in computer networks using stochastic epidemic model. Also, we model the dynamics of worm spread by building a transition matrix and numerical simulations are executed with MATLAB.

Key Words : Worm propagation, Epidemiology, Transition probability matrix, Markov chain. 2010 AMS Subject Classification : 60J22, 92D30, 97P99.

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