

System Survivability in Networks in the Context of Defense/Attack Strategies: The Large Scale

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Abstract : We investigate the large scale of networks in the context of network survivability under attack. We use appropriate techniques to evaluate and the attacker-based- and the defender-based-network survivability. The attacker is unaware of the operated links by the defender. Each attacked link has some pre-specified probability to be disconnected. The defender choice is so that to maximize the chance of successfully sending the flow to the destination node. The attacker however will select the cut-set with the highest chance to be disabled in order to partition the network. Moreover, we extend the problem to the case of selecting the best p paths to operate by the defender and the best k cut-sets to target by the attacker, for arbitrary integers $p, k > 1$. We investigate some variations of the problem and suggest polynomial-time solutions.

Keywords : defense/attack strategies, large scale, networks, partitioning a network

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