Routing Strategy in Complex Network

The structure and dynamics of complex networks have recently attracted a tremendous amount of interest and attention.The increasing importance of large communication networks such as the Internet upon which our society survives, calls for the need for high efficiency in handling and delivering information. In this light, to find optimal strategies for traffic routing is one of the important issues we have to address.

Problem Statement:

Therefore, the task would be to design various routing strategies and understand the effect of topology on the efficiency of these routing strategies. The routing can be broadly divided into two categories, first using the global knowledge of the network (eg. using shortest paths) and the second using local information (eg. random walk, preferential neighbor routing). Each node in the network has a fixed capacity which could be modeled as a constant for each node or can be a function of its betweenness centrality or its degree. The capacity at each node defines the amount of traffic that can be routed through a node. Therefore the various routing strategies can be evaluated on the network given the constraints of capacities at each node.

References:

1. "Path finding strategies in scale-free networks" - Beom Jun Kim, Chang No Yoon, Seung Kee Han and Hawoong Jeong
2. "Efficient routing on complex networks" - Gang Yan, Tao Zhou, Bo Hu, Zhong-Qian Fu and Bing-Hong Wang