The length of the stochastic shortest path problem is defined as the arrival probability to a given sink

node from a given source node. Discrete distribution probabilities of arcs existence are known and the

arrival probability is computed by establishing a discrete time Markov chain stochastic process. Two

conditions at any node are assumed toward the sink node, departing from current state to a new state

when a larger labeled node is visited, or waiting in the current state with expecting better conditions.

The uncertainty of the network topology causes several unstable connections between nodes.

However, the original network topology determines probable connections between pairs of nodes. The

critical node is determined by the maximum decrease in the arrival probability if it not presented in the

current unstable topology. The proposed method is illustrated by some numerical example.