Distributed queuing is an essential problem in distributed systems. Many processes generate requests and place them in a distributed queue. The Arrow protocol solves this problem using path reversal on a pre-computed spanning tree to find predecessors of requests. However, it is vulnerable to changes on the spanning tree, and the structure of the spanning tree influences efficiency of the Arrow protocol.

This paper presents a self-stabilizing protocol to improve the robustness and performance of the Arrow protocol. The protocol adds self-stabilizing mechanisms to the Arrow protocol running on the upper layer as well as to the underlying overlay network to build a skip+ graph. Compared to previously known alternative Arrow protocols, this protocol enhances the efficiency and enables manipulations on nodes and edges by only using local actions.