APPROXIMATION OF SERIAL LINES WITH MULTIPLE SERVERS AND FINITE BUFFER

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We consider the serial lines with finite buffers and parallel unreliable servers whose service time is exponential. The blocking after service blocking protocol is assumed. A server is either up (operational) or under repair(broken-down) at any time. We assume the operation dependent failure that is, each server at each stage can be failed only while the server is working. The time to failure and time to repair are exponentially distributed. The system is approximated based on the decomposition method. To reflect the dependence between consecutive nodes, we use the subsystem with three service stations and two buffer spaces instead of two service stations and one buffer space mostly used in almost all decomposition technique. The subsystems are approximated by two stages tandem queue with two buffers and state dependent arrival rates and service rates. The approximate subsystem is modeled with level dependent quasi-birth-and-death process. Arrival and service rates of the subsystem are calculated iteratively.