

## OPTIMIZATION OF SERVER FARMS

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In a server farm with infinitely many servers, each server can be busy, idle, or off. Jobs arrive according to a Poisson process and request exponential services. A new job occupies an idle server if there is one, and otherwise an off server (changing to busy). When a server becomes idle, there is the option to keep it idle or to switch it off (to save power). There are costs (per time unit) for idling and fixed costs to switch from off to on. We derive structural properties of the discounted cost (and average cost) optimal policy, analyze a simple heuristic policy and compare its performance with the optimal one.