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On the Analysis and Management of Cache Networks

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Abstract

Over the past few years Information-Centric Networking, a networking architecture in which host-to-content communication protocols are introduced, has been gaining much attention. A central component of such an architecture is a large-scale interconnected caching system. To date, the modeling of these cache networks, as well as understanding of how they should be managed, are both in their infancy.

This dissertation sets out to consider both of these challenges. We consider approximate and bounding analysis of cache network performance, the convergence of such systems to steady-state, and the manner in which content should be searched for in a cache network. Taken as a whole, the work presented here constitutes an array of fundamental tools for addressing the challenges posed by this new and exciting field.

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