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Abstract

An Investigation into the application of Content-Centric Networking within Challenged Network Environments using CCNx

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Information Centric Network (ICN) architectures offer a viable design to cope with the disruptive nature of Challenged Network environments. They aim to address the challenges of unreliable connectivity and location transparency to offer a delay- and disruption-tolerant solution. Named Data Networking (NDN), a prominent ICN architecture, uses a publish/subscribe-driven model and relies on two main message units for communication, called Interests and Data. Instead of a host-based model for data retrieval, an addressing scheme based on named data is utilized. The naming of data allows for retrieval of data from the network without the knowledge of individual hosts.
This thesis studies NDN behavior in a disruptive network environment. More specifically, we use CCNx as an implementation of a Content-Centric Networking protocol that inherits key characteristics from NDN. We study the behavior of CCNx using the Haggle testbed to simulate a simple disruptive network environment. We develop a delay/disruption-tolerant framework based on CCNx and implement the game Tic-Tac-Toe using that framework. The framework design is presented with an analysis into various alternatives that were considered. A more complex five-node experiment with link disruption is performed using the framework to evaluate CCNx in a real world scenario. We conclude that CCNx is good at handling disruptions associated with Challenged Networks.

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