

Analysis of NDN Repository Architecture and its Improvement for I/O Intensive Applications

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Abstract— Named data networking (NDN) has been researched to be a substitute of the conventional IPv4 Internet. Its advantages are strong security, in-network caching, and mobility support. In terms of network architecture, it emphasizes contents rather than its locations to access data after the consumer's interest is routed at each node. In contrast to many NDN researches on routing, node architecture, caching, security, and other research domains, there has been a little effort on the design and architecture development of NDN based repository and its file system to save contents efficiently. So far, there are two NDN repositories, such as NDNFS and Repone. They are designed to store files in NDN way so that data is sent and received over NDN network more efficiently. However, its biggest problem is the overhead when they run at I/O intensive environment, such as serving science-modelling data, which is large, sometimes over 3GB. In the performance evaluation of this paper, the extent of its severity is depicted. Moreover, the investigations on those architectures will help one notice the source of the overhead. According to our findings, an enhanced metadata scheme and its management strategy will be put forward to alleviate this problem. Furthermore, some of the implementation considerations for the NDN based distributed file system for I/O intensive environment will be discussed.

Keyword— Named Data Networking(NDN); repository; file system; Network; future Internet;



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