CS543 - Paper Review Report # III

Hailu Belay Kahsay - 20155624

Title: A Survey of Naming and Routing in Information-Centric Networks

Author: Md. Faizul Bari, Shihabur Rahman Chowdhury, Reaz Ahmed, Raouf Boutaba, Bertrand Mathieu

Internet was originally designed to be an end-to-end connectivity substrate for the delivery of data among geographically distributed user base. The delivery of the data from source to destination was based on IP address (i.e. it was host-centric) and TCP/IP protocol suite, a communication model that let Internet hosts to speak to each other by establishing communication pipes between them, has been used. Due to the fact that [1] host-centric Internet architecture is becoming inadequate for the modern bandwidth-intensive Internet usage patterns, [2] HTTP video are dominating Internet traffic and [3] DNS(Domain Name to IP address resolution) lack for content replication, movement and location awareness, content-oriented Internet models were introduced in 2000.

Information-centric networking (ICN) is an approach that evolves the Internet infrastructure away from a host-centric paradigm based on perpetual connectivity and the end-to-end principle, to a content-centric network architecture in which the focal point is "named information" (or content or data). It focuses on what is being exchanged rather than which network entities are exchanging information. That is, Data becomes independent from location, application, storage, and means of transportation, enabling in-network caching and replication. Improved efficiency, better scalability with respect to information/bandwidth demand and better robustness in challenging communication scenarios are some of the benefits of ICN.

In the survey paper introduction about ICN network architecture and its advantage over host-centric network is discussed in detail. It also talks about major ICN research challenges: secure and persistent Naming, name-based routing, Name resolution, in-network caching, on-demand replication, security, privacy, content dissemination, backward compatility, and incremental deployment capability.

Analysis and comparison on selected five ICN research papers namely Combined Broadcast and Content Based Routing (CBCB), Data-Oriented Network Architecture (DONA), Network of Information (NetInf), Named Data Networking (NDN), and Publish/Subscribe Internet Technology (PURSUIT) has been conducted by the authors to provide a reasonable coverage of the diverse research efforts toward naming and routing in ICN. Basic idea of each paper, the naming and routing approach, comparative analysis on the content naming and routing mechanisms and pros and cons of each approach are included.

Finally, the survey paper talks about the requirements of an ideal content naming and routing model (from the authors' perspective), which are still open research areas, for ICN. Though contents of ICN need globally unique, secure, location-independent, and friendly names, there is no globally agreed naming model. The authors proposed a multilayer naming scheme that combines self-certifying names with human-friendly keywords.