



2013 4th International Conference on Agriculture and Animal Science (CAAS 2013)
2013 3rd International Conference on Asia Agriculture and Animal (ICAAA 2013)

Applying Information-Centric Networking in Today's Agriculture

Pilaiwan Phupattanasin^a, Sheau-Ru Tong^{b,*}

^aDepartment of Tropical Agriculture and International Cooperation, National Pingtung University of Science and Technology, 912 Pingtung, Taiwan R.O.C.

^bDepartment of Management Information Systems, National Pingtung University of Science and Technology, 912 Pingtung, Taiwan R.O.C.

Abstract

Under the title of agriculture, Information and Communication Technologies (ICTs) enmesh the globe and represent a transformational opportunity for the livelihoods of smallholders to connect with the knowledge, institutions necessary, as well as sharing information on networking. With respect to information sharing, the Information-Centric Networking (ICN) is the Future Internet which has been recently proposed for efficiently accessing and distributing of content by replace the current host-oriented communication model toward a content-centric model. This article provides an overview of the novel of ICN architecture that is better suited to today's use, with a particular spotlight on content distribution and mobility technologies, which make ICN an excellent networking community for agriculture sector.

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Selection and peer review under responsibility of Asia-Pacific Chemical, Biological & Environmental Engineering Society

Keywords: AGRICULTURE DEVELOPMENT, FUTURE INTERNET, ICTs, ICN, MOBILITY

1. Introduction

Agriculture that continues grows also changes its structure. The question is: how can growth of the information networks help make development more sustainable? ICTs [1] in development agriculture effort have their own landscapes for sharing content [2], and central to sustainable development to meet the user-

* Corresponding author. Tel.: +886-8-7703202 ext 7909; fax: +888-8-7740306.
E-mail address: srtong@mail.npust.edu.tw.

centric system where information is readily available to users when they interested it [3].

With the demand for content distribution and replication of many sources, they generally fall into two main developments: Peer-to-Peer (P2P) overlays and content distribution networks (CDNs). P2P has been used informally to facilitate payments between small traders and farmers [4]. Nevertheless, there exists inability to effectively leverage in-network storage to reduce overhead. Even more importantly, suboptimal P2P peer selection that leads to expensive inter-provider traffic [5], and do not leverage the knowledge of the underlying network topology to achieve optimal performance [6]. While the relative position of the CDNs offers the high prices for caching services in economic incentives perspective, and there are very far away in small towns and rural areas [7].

Currently the ICN approaches placing as a heart paradigm, gaining increasing attention and departing from the host-to-host communication model. Typical examples are DONA [8], PSIRP [9], 4WARD [10], and CCN [11]. Interestingly, ICN assumes that users, programs and hosts are in general untrustworthy and mobile, communication is often multi-access, and primarily interested in retrieving, processing, and sharing information bits, instead of sharing processing and storage resources with others [12].

Mobile technologies rapid development with the various embedded features (i.e. messaging, browsing, cameras, media players, and the convergences of wireless) that facilitate the users have capable to creating and sharing their own content easily and fast, as an extension of the human need for communication with other people. That is, content dissemination to mobile devices has attracted much attention. Accordingly, mobile devices play roles as content consumers as well as content sources. Moreover, content consumers do not care where and how to obtain a piece of content [13]. Instead, they make much of how fast and reliably the requested content can be accessed [14].

Thus, this article presents the solution to content source mobility in CCN management that can apply into agriculture sector. In the next section, we present a compact overview of ICN, followed by a detailed discussion based on the CCN components, a real scenario are presented. We conclude with a discussion of remaining challenges.

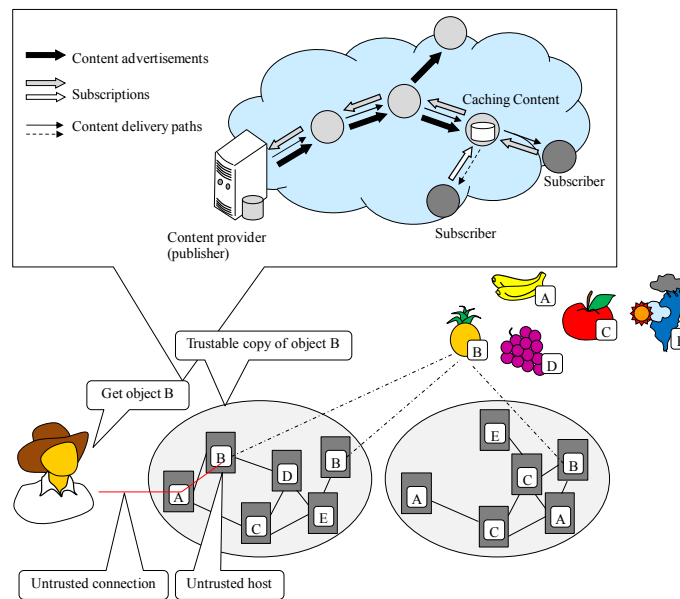


Fig. 1. ICN communication model: client side [5][15]

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