DEPARTMENT OF PHYSICS
TEXAS SOUTHERN UNIVERSITY

In-network Storage Assisted Virtual Backbone in DTN

Xiaoyan Hong
University of Alabama

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Biography

Xiaoyan Hong is an Associate Professor in the Department of Computer Science at the University of Alabama. She received her Ph.D. degree in Computer Science from the University of California at Los Angeles (UCLA). Her research interests are in the area of mobile and wireless networks, including mobility modeling, wireless ad hoc networks, opportunistic networks, vehicle networks, and intelligent transportation systems. She is also interested in virtualized network architecture. Her research has been supported by National Science Foundation and the University of Alabama Research Advisory Committee Award. She has published near 100 peer-reviewed papers in prestigious international journals and conferences. She serves on technical program committees for a number of major international conferences and reviews papers for many top-tier international journals on computer and wireless networks. More details can be found at http://hong.cs.ua.edu/.

Abstract

Human mobility (hence the movement patterns of mobile devices) offers opportunities for a message to be disseminated and delivered to a global geographical region using the encounter-based "store-carry-forward" routing approach. Movement characteristics, such as contact behaviors, geographical distributions, etc., can be of great help in assisting routing using the opportunities. Further assistants to routing can come from in-network storage. In this presentation, we introduce a virtual backbone based delay tolerant network (DTN) architecture that utilizes in-network storage located at critical locations. With the support of the virtual backbone, routing protocols can achieve better performance. We introduce two routing protocols that achieve different performance goals. Their routing strategies consider the aggregated mobility between pairs of storage devices, the time-varying delay features, and the time-varying link loading capacity. Real traces are analyzed to produce a time-varying connectivity graph that serves as the baseline virtual backbone network.

Phone: (713) 313-1850
Fax: (713) 313-1833
Office: Trailer #12