

MITATE: Mobile Internet Testbed for Application Traffic Experimentation

(Work in progress)

Utkarsh Goel, Ajay Miyyapuram, Mike P. Wittie, Qing Yang

Department of Computer Science,

Montana State University, Bozeman, USA

{utkarsh.goel, ajaykumar.miyyapuram, mwittie, qing.yang}@cs.montana.edu

In recent years, mobile applications have begun to support soft real-time services, such as video chat or multiplayer games. Most of these applications are delay sensitive in that user experience is affected by network induced delay. The increasing demands of mobile applications for real-time communication create a need for an improved understanding of mobile network performance. Even though cellular services claim to provide nationwide coverage, they under provision rural areas resulting in poor performance of mobile applications leading to user discontentment. Since most mobile applications are not currently designed to adapt with the changing network performance, there lies a potential need for a platform to evaluate and refine (or customize) communication protocols as per changing network conditions.

MITATE will be the first public testbed to support the prototyping of mobile application communications. MITATE is a collaborative platform that allows application providers to experiment and measure the performance of different transaction traffic between mobiles and cloud datacenters. These experiments can be configured to execute at different times of a day, with changing signal strength, and different network carriers, communication protocols, and user locations. The platform is also capable of evaluating observed traffic patterns of existing applications such as online social networks, gaming and real time streaming applications.

Existing mobile network measurement platforms are challenged in assuring sufficient resource capacity for scheduled experiments. The limiting resource is mobile data, subject to monthly caps. To assure a supply of mobile bandwidth that matches the demand, a mobile testbed must, first, entice users to contribute resources and, second, protect contributed resources from abuse. MITATE jointly addresses both problems using a data credit exchange system inspired by BitTorrent tit-for-tat mechanisms. Thus, MITATE credits users for contributed bandwidth, which allows them to use the bandwidth of others, keeping the two in a state of equilibrium.

Although MITATE is still in the development phase, we would like to share our innovative approach with the community and seek feedback on our design. Currently we are working on deploying MITATE on M-Lab and will be seeking beta testers in the near future.