Analytical Modeling of Multipath TCP Over Last-Mile Wireless

ABSTRACT

With the growing presence of smart-phones and the ensuing surge of mobile Internet traffic, last-mile cellular networks are becoming overwhelmed. The situation is anticipated to worsen in the near future. A recent approach adopted to alleviate this problem is to offload the data traffic through WiFi networks. A better approach could be to use an advancement of the Transmission Control Protocol (TCP), called multipath that can perform parallel data transmission over multiple available paths. Since most smart phones are equipped with cellular and WiFi interfaces, multipath TCP can significantly improve the reliability and quality of Internet access through smart-phones by simultaneously utilizing the cellular and WiFi paths and dynamically balancing the traffic as the number of competing flows changes.

EXISTING SYSTEM

The performance of TCP and multipath TCP over last-mile wireless networks has been experimentally studied and useful insights have been gained. One observation is that the wired part of both cellular and WiFi networks are high speed and the wireless last-mile is the performance bottleneck in both networks. However, detailed investigations are necessary to quantify the impact of cellular and WiFi access technologies on each individual path and their coupling. Moreover, a thorough understanding of the impact of diverse wireless access technologies is essential to further improve the multipath congestion control algorithms, and analytical modeling could provide such important insights.

DIS ADVANTAGES

- The wireless last-mile is the performance bottleneck in both networks.
- Cellular paths are of low bandwidth and high delay.

PROPOSED SYSTEM

In Proposed System, Analytical model for multipath TCP with WiFi and cellular last-miles. Our analytical model captures the coupling between the congestion windows pertaining to the two heterogeneous paths and the joint impact of the shared medium access control and the lossy bottleneck AP and BS buffers. It provides accurate predictions for the throughputs and buffer losses. We observed a new type of throughput unfairness when a mixture of regular and multipath TCP connections shares an AP with a drop tail buffer. We developed an extension to this mixed case when the AP employs admission control to equalize the buffer losses perceived by the regular and multipath TCP connections. Solution of our analytical model provided the appropriate values of admission probabilities that must be used to alleviate the throughput unfairness. We proposed two ways of implementing our solution, namely, logical buffer splitting and probabilistic admission control, both of which are promising ways to achieve the admission control. We applied the analytical model to study the impact of the number of users and the size of the bottleneck buffers at the AP and the BS on the throughputs and loss probabilities experienced by the regular and multipath TCP connections.

ADVANTAGES

- Provide a method for analytically predicting important performance metrics such as throughputs and buffer losses.
- It also captures the impact of the packet-level queueing and transmission mechanisms in the errorneous WiFi and cellular last-mile access networks on this coupling.

SYSTEM REQUIREMENTS

H/W System Configuration:-

Processor	-	Pentium –III
RAM	-	256 MB (min)
Hard Disk	-	20 GB
Key Board	-	Standard Windows Keyboard

Mouse - Two or Three Button Mouse

Monitor - SVGA

S/W System Configuration:-

Operating System : Windows95/98/2000/XP

Application Server : Tomcat5.0/6.X

Front End : HTML, Jsp

Scripts : JavaScript.

Server side Script : Java Server Pages.

Database : MySQL 5.0

Database Connectivity : JDBC