MPTCP Mobility

Mobile client

3G celltower

Server
MPTCP Mobility

Mobile client

Server

Wifi

Wifi
MPTCP Mobility

Mobile client

Wifi

Server

Wifi
MPTCP Mobility

Mobile client

Wifi

Server

Wifi
MPTCP as a mobility solution

Short paper:  http://nrg.cs.ucl.ac.uk/mptcp/mobility.pdf

**Scenario:** want to use variable quality 3G and intermittently available WiFi hotspots.

- Preliminary results show we can achieve better **throughput**, more **robustness**, and save **battery power**.
Need to be able to depend on MPTCP availability

- Problem:
  - For the near future, most of the servers won’t support MPTCP.

- Solution:
  - Perform MPTCP to a proxy.
MPTCP client sends SYN to proxy, indicating address of final server. Proxy initiates connection to server.
New subflows are set up to the proxy, which load-balances in the normal MPTCP manner.
MPTCP Mobility: MPTCP Server

Mobile client

MPTCP Proxy

MP_CAPABLE

MPTCP Server
Proxy knows server is MP_CAPABLE. Sends ADD_ADDR to tell client.
Client sets up new subflow direct to server. Proxied path becomes backup - not used for data traffic.
MPTCP Mobility: MPTCP Server

New subflows go direct to server.
MPTCP Proxies

- Proxies are TCP-level relays - no application semantics.

- Protocol implication:
  - Need to indicate (preferably in SYN) the address of the server the proxy should connect to.
  - No other change needed.

- Issue: space in SYN.
mptcp congestion control
Full paper in NSDI 2011 (yesterday!) describes in detail the design and performance of the linked congestion control mechanism.

Draft updated to the version of the algorithm from the paper (previous draft had a bug - didn’t express what we actually implemented!).
Congestion Control in the Data Center.

Effect of a hotspot on different algorithms.
Measured performance on Amazon’s EC2 data center. 10 nodes, 3700 periodic pairwise transfers over 24 hours.

Nodes on same switch or same VM: only one path available

MPTCP congestion control gives 3x improvement where multiple paths are available

MPTCP, 4 subflows
MPTCP, 2 subflows
TCP