facebook P2P

Olin College of Engineering SCOPE

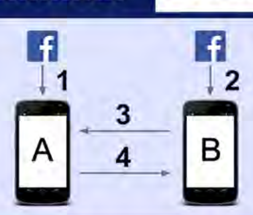
Original download entire news feed from Facebook

1. A downloads news feed from Facebook
2. B downloads **news feed** from Facebook

Reduced download overlapping posts from peers and the rest from Facebook

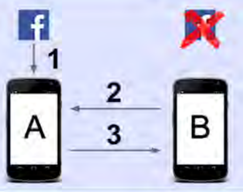
1. A downloads news feed from Facebook
2. B downloads news feed post IDs from Facebook
3. B sends news feed post IDs to A
4. A sends **overlapping news feed** posts to B
5. B downloads non-overlapping **news feed posts** from Facebook

Minimal download overlapping, public, and mutual friend posts from peers



1. A downloads news feed from Facebook
2. B downloads news feed post IDs from Facebook
3. B sends news feed post IDs and friends IDs to A
4. A sends overlapping **news feed posts**, **public posts**, and **mutual friend** posts to B

Offline download public and mutual friend posts from peers



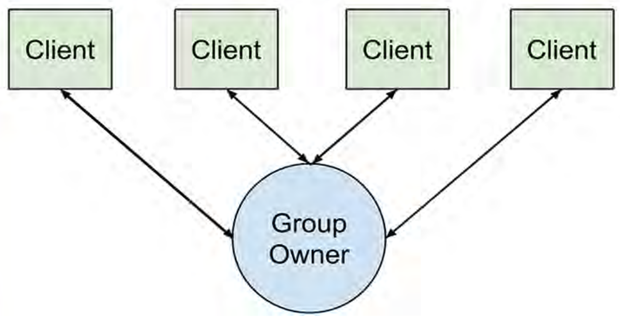
1. A downloads news feed from Facebook
2. B sends friend IDs to A
3. A sends **public posts** and **mutual friend posts** to B

App Description

To demonstrate how peer-to-peer data sharing reduces data consumption, our team has produced a mock-up of the Facebook Android app that enables users to connect to peers in an ad-hoc network.The app provides a tangible way of comparing a news feed downloaded from Facebook with a news feed populated by posts downloaded from peers in the vicinity. Users can choose from a range of data usage modes. A higher data usage mode results results in a news feed closer to a conventionally acquired Facebook news feed.

P2P Connection

Users connect to each other using Android's Wi-Fi-Direct. The Wi-Fi Direct connection is a one-to-many connection system with a single group owner connected to multiple clients. When multiple phones are within Wi-Fi-Direct range, the app'sservice, a persistent process that runs in the background, discovers other phones that have the same service. Once the service finds another service service find another service, they automatically select one to be a group owner which acts as a hub that other clients can connect to and co- mm unicate through.

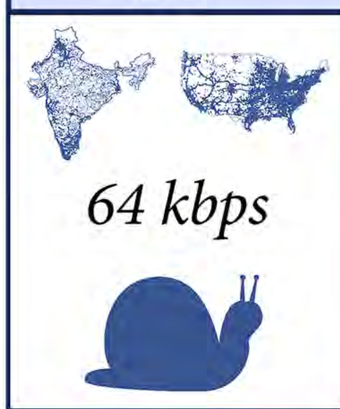


We wanted to find ways to reduce data consumption in emerging mobile markets

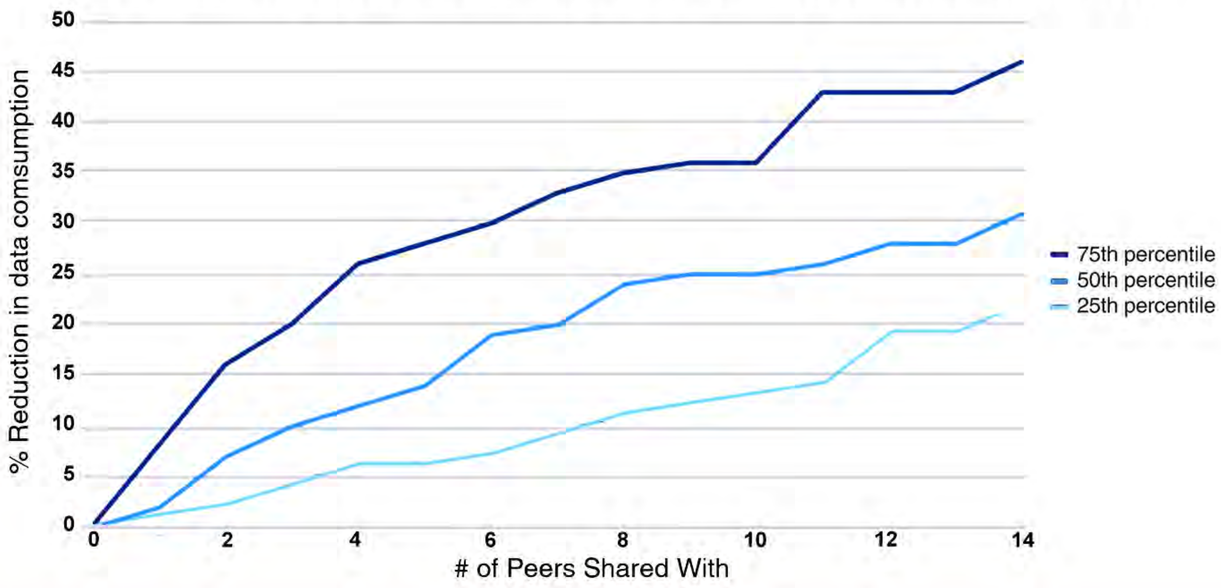
Problem Statement

Hundreds of millions of people use the Facebook Android app; many of them live in emerging markets where mobile network connections are slow and un- reliable. As Android device use in these areas continues to grow, conservation of mobile data has become increasingly important. During the 2013-2014 school year, the Olin College SCOPE team developed a proof-of-concept Android application to show how Facebook can reduce the data consumption of their Android application via peer-to-peer data connections for Android users in emerging markets.

Network Speed

2G	3G	4G
		
64 kbps	*2,000 kbps*	*100,000 kbps*
Time Spent Downloading Newsfeed (seconds)		
20 s	.6 s	.012 s

Reduction in Data Consumption for an Indian Network



Application Viability

From a study our team conducted of a high school network in India, if an Indian user were to connect with 10 randomly selected peers within the population, they could expect to reduce their news feed data consumption by 25%. These results confirm that this potential reduction in data consumption would make a tangible difference to Facebook Android users.