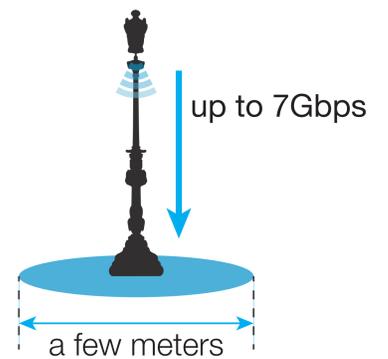


Traffic Offloading to Millimeter Wave Access Network based on Content-Centric Networking

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Motivation

Mobile traffic offloading to Wi-Fi is widely practiced as a way to reduce data traffic on mobile networks. However current Wi-Fi network is also congested and requires more wide band frequency. 60 GHz millimeter wave bands which are unlicensed bands provide high-speed wireless data transfer but its directionality and strong absorption limit the coverage area.



Concept of Milligate Access Network



Download

Consumer starts content download using mobile network (e.g., LTE/3G)

Pre-fetch

When Consumer enters the milliwave network, content chunks required in the future are downloaded using the network.

Consumption

Consumer continue to service using the pre-downloaded content chunks. Help from the spot networks improves the content download time and offloads come portion of the mobile network traffic onto the milliwave network.

Challenges

To design the content delivery system on the milligate access network concept, the system considers the advantage and disadvantage of the small coverage area of the milliwave network.

Monopolized high-speed bandwidth:

The number of consumers who belong the same area is small. Thus the customer can monopolize its high-speed bandwidth

Short connection time:

Consumer passes through the coverage in a very short time (a few seconds)

Design

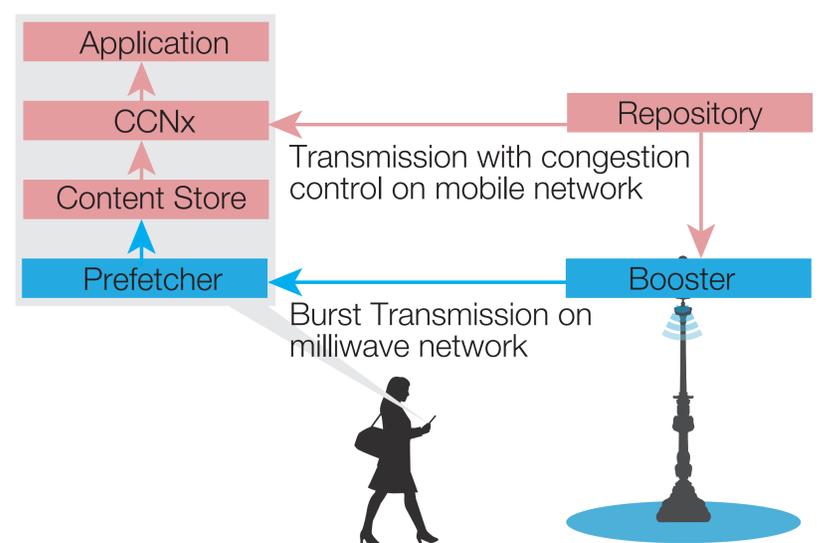
To establish mobile data traffic offloading onto the milliwave network, we require a method to aggregate the different transmission methods, i.e., burst transmission and congestion-control based transmission. The challenge of this paper is to develop an aggregation method with the following features:

Network Compatibility:

The proposed method must be developed without any changes to the current mobile network.

Application Compatibility:

The proposed method must not require any application's supports. Moreover, the modification of network elements, such as mobile devices, router and server, is kept to a minimum.



CCN Benefits

Sessionless Communication:

Since CCN does not require to establish and keep end-to-end session, we are able to offload mobile data traffic onto milliwave network without switching or aggregating sessions. This benefit reduces an initiate processing time into a milliwave network and makes effective use of short connection time.

Device Independence:

Since CCN does not dependent on data transmission methods, it is easy to aggregate the burst transmission and the congestion-controlled transmission. This benefit makes effective use of monopolized high-speed bandwidth on milliwave network.