Low-Latency Heterogeneous Networks with Millimeter-Wave Communications

ABSTRACT

- The heterogeneous network (HetNet) is a key enabler to largely boost network coverage and capacity in the forthcoming 5G and beyond. To support the explosively growing mobile data volumes, wireless communications with millimeter-wave (mmWave) radios have attracted massive attention, and is widely considered as a promising candidate in 5G HetNets. In this article, we give an overview on the end-to-end latency of HetNets with mmWave communications. In general, it is rather challenging to formulate and optimize the delay problem with buff ers in mmWave communications, since conventional graph-based network optimization techniques are not applicable when queues are considered.Toward this end, we develop an adaptive low-latency strategy, which uses cooperative networking to reduce the end-to-end latency. Then we evaluate the performance of the introduced strategy. Results reveal the importance of proper cooperative networking in reducing the end-toend latency.

EXISTING SYSTEM

- To signifcantly improve the spectral efciency and throughput, future wireless networks, for example, the ffth generation (5G) mobile network and beyond, are expected to be largely implemented heterogeneousy, that is, heterogeneous networks (HetNets) .
- With the proliferation of electronic devices and the rapid development of computer science, the trafc load of wireless communications increases continuously and tremendously. To meet the ever increasing requirements in capacity, one of the most important technologies is millimeter-wave (mmWave), which enables multi-gigabit-per-second transmission rates, thanks to the abundant spectral resources .

PROPOSED SYSTEM

- In this Paper, we give an overview on the end-to-end latency of HetNets with mmWave communications. In general, it is rather challenging to formulate and optimize the delay problem with buff ers in mmWave communications, since conventional graph-based network optimization techniques are not applicable when queues are considered. Toward this end, we develop an adaptive low-latency strategy, which uses cooperative networking to reduce the end-to-end latency. Then we evaluate the performance of the introduced strategy.

HARDWARE REQUIREMENTS

- Processor - Pentium –III
- Speed - 1.1 Ghz
- RAM - 256 MB(min)
- Hard Disk - 20 GB
- Floppy Drive - 1.44 MB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

SOFTWARE REQUIREMENTS

- Operating System : Windows 8
- Front End : Java /DOTNET
- Database : Mysql/HEIDISQL

CONCLUSION

- HetNets with mmWave communications can signifcantly improve network coverage and capacity to satisfy ever increasing requirements in data rates and latency. We have considered a HetNet consisting of one MeNB, two SeNBs, and one UE, and investigated the low-latency strategy for the downlink transmission from the MeNB to the UE. For the HetNets with buff ers, we have introduced an adaptive strategy based on cooperative networking, which largely minimizes the latency through optimizing trafc allocations. Results have demonstrated that proper cooperative networking is critical in reducing the end-to-end latency, thereby providing an insight on traffic management and network optimization for future HetNets.

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