A Novel Forwarding Policy under Cloud Radio Access Network with Mobile Edge Computing Architecture

ABSTRACT

- ”Latency” is one of the most critical key words in future mobile networks. To satisfy low-latency requirements, CRAN with MEC architecture seems to be able to achieve the goal.
- Cloud radio access network (C-RAN) combined with Multi access/mobile edge computing (MEC) seems to be one of the most feasible new RAN architectures to fulfill the requirement.
- With the assistance of MEC, the computing resource could be allocated more efficiently.

CONTINUE

- In this paper, firstly the advantage of generalized-processor-sharing model (GPS) compared with firstin-first-out (FIFO) and processor-sharing (PS) are discussed in order to figure out the practical queueing behavior in MEC system.
- Next, the relationship between theoretical traffic intensity factor and realistic system CPU utilization condition is correlated.
- Finally, based on the discussion, a two threshold forwarding policy (TTFP) algorithm is proposed to dynamically arrange the data traffic according to current system traffic states.

EXISTING SYSTEM

- Nowadays, dozens of low-latency required application are emerging, traditional mobile network architecture would not be able to support such applications anymore in the future.
- The proliferation of mobile data traffic especially video and voice streaming has been anticipated to be dramatic and unprecedented in the future.
- To accommodate such large traffic loads, deploying much more small cells seems to be a intuitive way to increase the system capacity.

CONTINUE

- However, such implementation may increase nor only capital expenditure but also operating expense to operators.
- How to reduce the network deploying and operating costs when meeting the data traffic demands is a critical issue.

PROPOSED SYSTEM

- In this paper, firstly the advantage of generalized-processor-sharing model (GPS) compared with firstin-first-out (FIFO) and processor-sharing (PS) are discussed in order to figure out the practical queueing behavior in MEC system.
- Next, the relationship between theoretical traffic intensity factor and realistic system CPU utilization condition is correlated.
- Finally, based on the discussion, a two threshold forwarding policy (TTFP) algorithm is proposed to dynamically arrange the data traffic according to current system traffic states.

CONTINUE

- The function of baseband processing is that the system would decrypt a packet first before computing, some information would be revealed in this stage, such as application intention, routing path and priority .
- The end devices forwarding a large amount of data traffic to the MEC platform, the packets might experience larger processing and queueing delay, which may fail the lowlatency requirement.
- Thus, designing a data forwarding policy to optimize and reconcile the volume of the traffic computed in the MEC node is necessary.

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

- In general purpose processor(GPP) platform, the MEC system could handle not only baseband processing but also data computing, which makes the utilization of computing resource more efficient.
- In this paper, the relationship between system traffic intensity and CPU utilization is certified, and the merits of generalized-processor-sharing model(GPS) model is also presented.
- After discussing, GPS system is more appropriate to be the reality compared model than firstin-first-out(FIFO) and processor-sharing(PS) model.

CONTINUE

- In this paper, Two-Thresholds Forwarding Policy(TTFP) algorithm is proposed to dynamically arrange the data of applications according to the current system state. According to the result in algorithm simulation, implementing TTFP could fulfil the latency requirement of delay sensitive APPs as possible.

REFERENCE

[1] N. Bhushan, J. Li, D. Malladi, R. Gilmore, D. Brenner, A. Damnjanovic, R. Sukhavasi, C. Patel, and S. Geirhofer, “Network densification: the dominant theme for wireless evolution into 5G,” IEEE Communications Magazine, vol. 52, no. 2, pp. 82–89, 2014.

[2] A. Checko, H. Holm, and H. Christiansen, “Optimizing small cell deployment by the use of C-RANs,” European Wireless 2014; 20th European Wireless Conference, pp. 1–6, Jun. 2014.

[3] R. Wang, H. Hu, and X. Yang, “Potentials and challenges of C-RAN supporting multi-RATs toward 5G mobile networks,” IEEE Access, vol. 2, pp. 1187–1195, Oct. 2014.

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[4] Z. Kong, J. Gong, C. Xu, K. Wang, and J. Rao, “eBase: A baseband unit cluster testbed to improve energy-efficiency for cloud radio access network,” Communications (ICC), 2013 IEEE International Conference on, pp. 4222–4227, Jun. 2013.

[5] Y. Ku, D. Lin, and H. Wei, “Fog RAN over General Purpose Processor Platform,” Vehicular Technology Conference (VTC-Fall), 2016 IEEE 84th, pp. 1–2, Sept. 2016.

[6] Y. Shih, W. Chung, A. Pang, T. Chiu, and H. Wei, “Enabling LowLatency Applications in Fog-Radio Access Network,” *IEEE Networks*, vol. 31, no. 1, pp. 52–58, Jan. 2017.