DIFFERENT SERVICES RESOURCE SCHEDULING IN LTE

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Abstract

Data transmission networks face extreme challenges in providing high data rate and low latency. In this paper identify main challenges of the art uplink/downlink scheduling in LTE, scheduling GBR and non-GBR services.

In mobile communication there is shift traffic from voice to data. requirement asymmetric uplink and downlink capacity the data usage inconsistent. Data usage requirement set changes with user actions this it least uplink, downlink requirement or there is large capacity requirements. Packet scheduling is to manage and schedule services corresponding to their characteristics. The task of packet scheduling - there are several packet streams waiting to be served , need determine service rules arrange the queue, service time and transmission rate to satisfy their QoS needs [1]. Scheduler use to achieve fast packet scheduling and the core function of MAC layer in LTE eNodeB. This is a major impact on the performance of the system.

Uplink and downlink schedulers allocate physical layer resources for UL-SCH and DL-SCH respectively. Schedulers function allocating resource to users properly for the subject of maximizing system throughput. On that ensured condition packet delay and QoS. Scheduler TTI and the services scheduler CQI checks for each user the eNodeB buffer and the HARQ buffer [2]. If buffers has data the user is for scheduling within this TTI. For the users with pending retransmissions HARQ give the highest priority. For scheduling are propose used

1) channel prioritization services GBR and non-GBR QoS, 2) MAC logical user CQI(channel quality indication), 3) fairness between users for GBR bearers and non-GBR bearers.

The GBR service and her resource allocation are prior to non-GBR service. There may be many users in the network and these occupy too much resource to transport GBR data. And thus lead to the reduction of system throughput and have bad channel quality. Is set a threshold -magnitude of the resource that GBR services can utilize. If magnitude is large, it means that there will be more resource that GBR services can use. and their QoS needs is able to be satisfied sufficiently. Magnitude can be set based on the number of users and number of GBR services in the network. If that there are non- GBR resource while there still exist GBR services, stopping serving for them. If all of GBR services have been served before GBR resource is exhausted, the rest resource belong to the non-GBR .Resource scheduling has two steps for different services: resource allocation of GBR services and resource allocation of non-GBR services.

Resource allocation of GBR services.

If there are GBR services, we allocate resource for them preferentially. If all of the GBR avail-able resource is exhausted, then serve non-GBR services in turn. When allocating resource for GBR services, should take into account users' channel quality, packet delay and logical channel prioritization. For GBR services is set of calculation the priority. Several services may be available at the same time for one user. So, there are several DTCH (downlink dedicated traffic channels). Priority between them is determined by MAC logical channel prioritization. Is introduced parameter to prioritize DTCH. The larger wait time of packet value, the higher priority it corresponds to.This is capable of enhancing the scheduling priority of users who have longer wait time.

Resource allocation of non-GBR services.

Are begin to allocate resource for non-GBR services after all GBR services have been served or GBR available resource is exhausted. They have of their lower demand for QoS, and is out delay and loss rate factors. To enable QCI high service and get higher priority Is add ratio priority in calculation.

To avoid starvation, while still serving the logical channels according to their priorities, in LTE a prioritized bit rate (PBR) is configured by the eNodeB for each logical channel. When allocating resource for users, RBs needed by PBR will be allocated in the first place. Only when all logical channels have been served up to their PBR, then if there is still room left in the MAC PDU each logical channel is served again in decreasing order of priority. In the process of secondary distribution, only logical channels that still have data can be served in decreasing order of priority. Priority here is the one is calculated before.

Are given the mixture of the different QoS services of LTE MAC. Scheduler serves users with three different QoS services (VoIP, video and FTP) are defined. Service is used: service type for GBR-VoIP(QCI=1), video(QCI=2); for non-GBR - FTP (QCI=8) .

Some of them must be served with higher priority. Are investigated what happens if mix all these services within one QoS class without distinguishing between the GBR and non-GBR, and what happens if separate them.

Users all users' emergency telecommunication services can be served there is no difference in throughput. With the user number in system increased, wireless resource is insufficient. In this case, VoIP and video prioritization does not work. The prioritization of VoIP and video result in the decrease of FTP throughput. Some of the RBs are allocated to users who have poor channel quality to transmit GBR data instead of serving users with high channel quality- this also leads to the reduction of the sector throughput. with the Increase of users throughput of VoIP and video in the proposed algorithm is higher than the conventional, this is because we allocate RBs for GBR data prior.

The key is that GBR service is prior to non-GBR. This assures the QoS of real-time services at the cost of a certain amount of non- real time services' performance. Shown how the LTE MAC scheduler handles the mixture of the different QoS services and serves users with three different QoS services (VoIP, video and FTP).

We get sector throughput by means of calculating transmitted data in sector, and service delay by packet wait time. Fairness between users can be computed via the formula. This algorithm is capable of improving throughput of GBR bearers. The number increase of users, at the cost of a certain amount of performance drawback of FTP, video and VoIP are capable of keeping preferable fairness and lower delay compared with conventional PF algorithm . GBR service is prior to non-GBR that assures the QoS of real-time services at the cost of a certain amount of non- real time services' performance.

Conclusion

In this thesis we have addressed the problem of scheduling for QoS packet flow in LTE networks, prioritization of services considered GBR and non-GBR services to improve performance.

References

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