Characterizing Multiparty Voice Communication for Multiplayer Games

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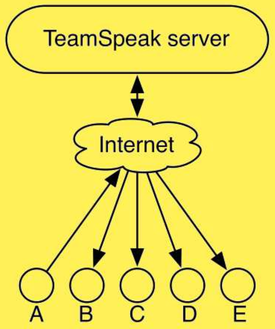
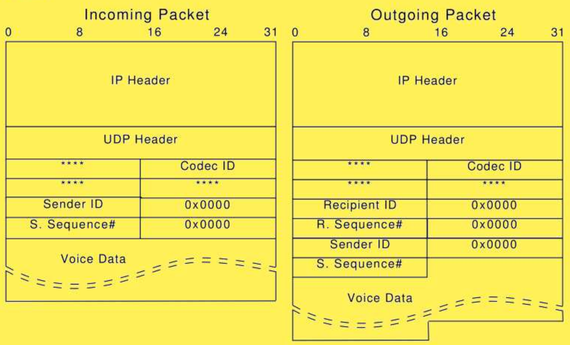
I. Trace Collection

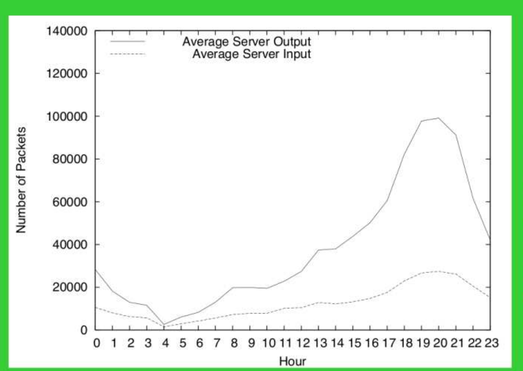


This is the first measurement study on the characteristics of multiparty voice communications. Over a 3 month period, we measured over 7,000 sessions on an active multi-party voice communication server to quantify the characteristics of communication generated by game players. To conduct our study we set up a TeamSpeak server, which unicasts the packets of the sender to all the other clients.

The senders encode the voice packets using the Speex codec and than send the encapsulated packets to the server. Filtering for the packet size and the Codec ID guarantees the identification of the voice packets.

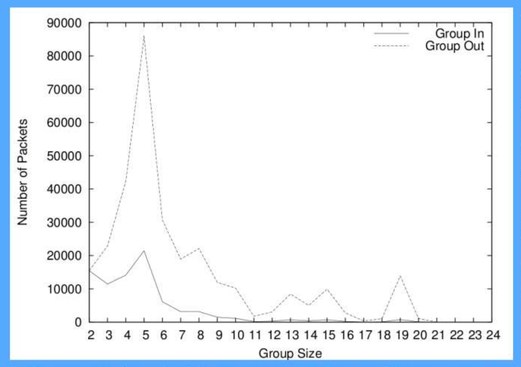


II. Overall server Traffic



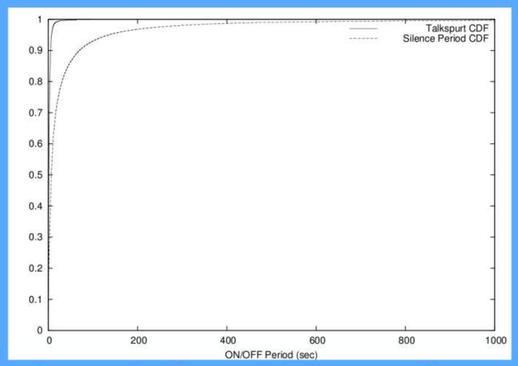
In the busiest hour, we captured more than 20000 incoming and more than 100000 outgoing packets. Our server experienced the lowest traffic around 4am (less than 2000 packets in both directions). Our results showed that the peak period is between 6pm-9pm and that the traffic rate during this time is almost constant. In other words, the number of sessions started is the same as the number of sessions finished during this period and thus resembles a balanced birth-death process.

III. Voice Patterns and Group Sizes



The ratio between the inbound and outbound traffic is an indicator of the average group size. We binned all data according to how many people it was duplicated to. Thus, we could determine the effect of the groups with different sizes on both the incoming and outgoing traffic on the server. The results on group sizes show that the most active groups are the ones that are formed by 5 people. We also concluded that these groups generate the most outgoing traffic among all the groups.

In order to measure the voice patterns, we captured 188,225 individual voice packets during the peak periods (6pm–9pm) during the three month measurement period. We plotted the CDFs of the talkspurts and silence periods. Both CDFs appear to follow an exponential distribution. However, the expected value of the talkspurts is much lower than the expected value of the silence periods. 90% of the talkspurts are shorter than 5.4s, whereas 90% of the silence periods are shorter than 70.11s, which is more than an order of magnitude higher. This implies that the users tend to listen more than they talk.



IV. Conclusion

We have presented the first work that examines the characteristics of multiparty communication for games. Our results present an insight to the overall server traffic, the group sizes as well as the typical silence periods and talkspurts for multiparty voice communication, which can be used for future research, simulation, network engineering, and game development work.

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