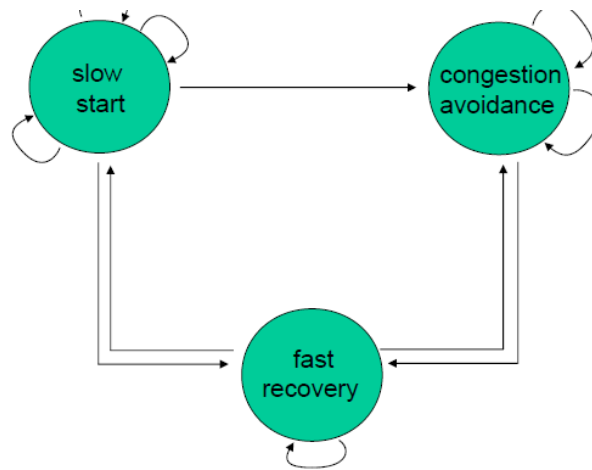


## MECAC WEEKLY REPORT (April 22 – April 28)

This week we have worked on intelligent streaming problem within the server component of the Virtual Turkey. Here is background information about what the problem is. In server component, there is a variable named bandwidth which determines maximum number of update packets to be sent to clients. In our implementation of event matrix, this bandwidth is a fixed variable in our implementation. However, it is a significant problem to determine actual value of bandwidth variable. One obvious upper limit for the overall bandwidth is the uplink bandwidth of the server to the internet. However, there could be other unknown limitations to the bandwidth as there is an ever changing cloud of routers between server and clients. For example if clients are real close to the server and are accessible with only 2-3 hops, then the bandwidth variable should be high to fulfill the underlying network infrastructure and provide players with seamless game play. However when there is congestion over multiple hops that connects the server and the client, the bandwidth of the server network component should be kept low so as to minimize the network overhead and maximize time spent on packet distribution.

Umit has investigated this issue by researching the literature for existing MMOG architectures and how they handle the dynamic bandwidth adjustment problem. For example in (1), (2), MMOG developers have implemented TCP like congestion control mechanism to adjust the bandwidth of the server dynamically.



Main congestion control mechanism of TCP has been given as above. The article in (1) adjusts the server bandwidth much like TCP controls congestion control mechanism.

Cinar and Mert have worked on the server network component together to implement findings of Umit. We have computed round trip time between server and the client to increase or decrease the bandwidth limit on the server side.

If the average round trip time (RTT) between server and the clients is high, this implies that there is congestion in the hops that connect between server and clients. Then, the bandwidth is reduced to compensate for the congestion. When the RTT is low, the server automatically increases the bandwidth to fulfill the underlying network capacity.

We have also prepared test specification this week as a group. We have first prepared initial draft for the test specification and then got a feedback from our assistants. Considering valuable feedback that came from course assistants, MECAC has prepared the revised report and submitted it through cow.

This week the research that Umit has conducted has pointed to number of improvement areas in Virtual Turkey. For example in (1) & (2) MMOG developers have significantly compressed position updates for small memory clients. Next week, we plan to improve on areas where Umit's research brought to bear.

## References

- 1) Game Engine of Leading Mobile MMORPG in China: Architecture, Performance, Optimization, Jianmin Wang, Zibin Zheng, Dayao Huang, Peter Tam.
- 2) MMORPG Player Actions: Network Performance, Session Patterns and Latency Requirements Analysis, Mirko Suznjevic, Zagreb.