

Enhancing the multicast performance of structured P2P overlay in supporting Massively Multiplayer Online Games

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Abstract

Scribe is a scalable application level multicast infrastructure. We developed two techniques to improve the performance of Scribe in terms of latency and bandwidth distribution. The first technique identifies that the final hop of Scribe traffic path is entirely randomized and incurs the longest distance traveled, and hence introduces Proximity Neighbor Selection (PNS) into the final hop for latency improvement. The second technique builds a hierarchical two-level overlay. While PNS can be applied at both levels for latency performance, the bandwidth stress required by applications can now be distributed among the nodes in the higher level overlay. Our simulation using GT-ITM topology has shown that both techniques have improved latency performance for more than 30 percent, and the two-level overlay has improved bandwidth distribution up to 3 times, comparing with what can be achieved by a standard Scribe overlay. We developed the techniques in the context of Massively Multiplayer Online Games (MMOGs). While Scribe provides a possible platform for the scalable deployment of MMOGs, game developers may leverage the techniques to promote the design of real-time interactivities between players in the game world.