## Database and State Replication in Multiplayer Online Games

Paula Prata<sup>1,2</sup>, Etelvina Pinho<sup>2</sup>, Eduardo Aires<sup>2</sup>

<sup>1</sup>Institute of Telecommunications <sup>2</sup>Department of Computer Science Universidade da Beira Interior 6201-001 Covilhã, Portugal pprata@di.ubi.pt, etelvina.nunes@gmail.com, eduardoaires@gmail.com

*Abstract* — Online games are nowadays part of an industry that involves several million dollars in transactions. Despite games are not critical applications in a traditional way, fault tolerance as a path to achieve high availability rates starts to emerge. A few hours or even days of game downtime can represent significant losses, either by subsequent player resignation or a strong credibility decrement. This article embodies a study on the cost of fault tolerance techniques, for both data and state replication, when applied to the well-known multiplayer game Dungeons & Dragons. The evaluation of the replication cost was done using the JMeter tool to simulate several simultaneous games. We reasoned out that although performance becomes smaller with the increase of connected players, that drawback is mainly related to the number of connections rather than replication itself.

Keywords - online games; fault tolerance; database replication; state replication; game availability