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## Chapter 1 Introduction

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Research into virtual world (VW) technology has many applications from military simulations [14] to computer networked games [6][16][37][38]. It is created by one or more computers connected on the Internet. The virtual world can exist in a form that last months, even years. It is not only a computer system, but a service that touches hundreds or thousands of players. Reliability and scalability are, therefore, very important requirements for VW systems. Real players interact, sending VW commands to each other. Changes by one virtual player are played out on the monitor of some other player or players. This is the basic stuff of the interactions between VW players.

Different VWs have different characteristics. For example, a military simulation system may need real-time support and less frequent interaction between players; a shopping mall virtual environment may have important concerns security issues but ignore real-time issues; a collaboration research virtual environment for data analysis may only provide services for researchers and focuses on data transmission bandwidth issues. Another a recent and popular manifestation is a type of online games - massive multiplayer online game. This is a VW service that is backed by a substantial industrial infrastructure and reaches a large participating public counted in thousands. The frequent interaction it involves calls for reliable, scalable, secure and real-time support. In this dissertation, we present a VW platform that focuses on the issues for MMOG service.

Massive Multiplayer Online Games (MMOG) are the most popular and successful models of the kind in the game industry. Most involve thousands of players (between 2000 and 9000 on most current game servers, with some games requiring multiple

servers) playing simultaneously in a large persistent map [21]. Because of the rapidly growing associated revenue, especially in Korea and Taiwan[18][19][20], the study of these games is of major importance for EA, Microsoft, Sony and other traditional game companies around the world.

From year 2002, Korea became the world's largest exporter of online games, producing hundreds annually [19]. For example, there are seventy to eighty Online Games available in the Taiwan market in 2003, many from Korea. In such a competitive market, the most important consideration for game development companies is the time to market. The fact is, though, that companies usually take much longer to develop a new MMOG (say, two to three years) than a new traditional single player game (say, nine months to a year). MMOG producers must think not only about the creative tasks but also about network and distribution technologies, concerns that may be new to them. In our opinion, their lack of technology of distributed computing and MMOG business concepts make the more rapid development of MMOGs difficult.

This dissertation look at these issues and propose a solution involving a scalable MMOG platform based on distributed technology that will help producers create a MMOG quickly and minimize their concerns about network transmission and collaboration between servers and clients. Also, a scalable MMOG platform as well as being concerned with performance must take code maintainability, fault tolerance, and the availability of programming staff into account.

Therefore, in this dissertation, a MMOG platform which satisfied these basic requirements is purposed, these will ensure success for such a platform in terms of *in-time-to-market, low cost, high performance, and scalability, maintainability.*