STL: A Tool for On-line Software Update and Rejuvenation

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Abstract

A large number of tools and techniques have been developed in the past to achieve a 24x7 system availability (24 hours a day and 7 days a week) by reducing unscheduled system downtime due to failures. However, a highly available or fault tolerant system may still have to be taken off-line for software and hardware update, maintenance, and rejuvenation. Therefore, the scheduled downtime for maintenance could become the major source of system unavailability. One big challenge in a highly available system is to keep the system running while it is undergoing software updates or bug fixes. In this paper, we describe a tool that can be used to perform an on-line update of software in a cluster environment. The tool consists of a protocol compiler stgen and a library libst for marshaling and unmarshaling data during a software update. The tool has the ability to transfer complex data structures between two processes even if the data definitions in the two processes are different. The data transfer format is machine-independent. Hence, the tool can transfer data across processes running on different machine types. The paper describes some real-life applications of the tool and presents the performance measurements of the tool for the applications.

Keywords: software rejuvenation, software on-line update, cluster systems, fail-over, call processing.