

Preventive Maintenance for Virtualized Local Disaster Recovery Plan

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Abstract

Preventive maintenance combined with disaster recovery planning will help to minimize the hardware and software problems if disaster occurs. Disaster recovery processes involve unplanned interruption of services. Unplanned downtime is mainly caused by software failure due to software aging rather than hardware failure. Preventive maintenance (software rejuvenation) is used to counteract the software aging phenomenon. In this paper, we propose preventive maintenance model for virtualized local disaster recovery plan through a stochastic Petri net model. In the proposed model, active-standby virtualized clustering architecture is employed. We analyze how preventive maintenance can improve the system availability of virtualized local disaster recovery plan. We perform the evaluation of the proposed model using SHARPE simulation tool.

Keywords: availability, clustering, local disaster recovery, preventive maintenance, stochastic Petri nets, virtualization.

1. Introduction

As businesses increasingly rely on IT for their mission-critical operations, it is essential to have plans in place to ensure your business viability is not at risk from a critical incident. Business continuity is the ultimate goal of critical facilities. The disaster recovery (DR) is a critical part of business continuity, refers to the process of restoring mission-critical systems, applications and data at time of interruption. There are

two broad categories such as natural or man-made disaster which can cause site failures. There are many different options for disaster recovery such as utilizing recovery site services which can bring your business back up to speed quickly. Therefore disaster recovery planning is essential. A good disaster recovery plan covers the hardware and software required to run critical business applications in the event of disaster.

Disaster and its recovery processes involve unplanned interruption of service. Unplanned downtime is mainly caused by computer failure, network failure, software failure and local or regional disaster [8]. Preventive maintenance (PM) refers to the schedule of planned maintenance actions aimed at the prevention of breakdowns and failures in the event of disaster. The goal of various preventive maintenance tasks to software and hardware, disaster recovery procedures and networking monitoring is to enhance reliability and performance.

As business becomes increasingly dependent on information and computing technology, continuous availability is a universal concern. Failures of computer systems are more often due to software faults than due to hardware faults. The state of software degrades with time is known as software aging. Software aging has not only been observed in software used on a mass scale but also in specialized software used in high-availability and safety critical applications. The most effective way to handle software failure due to software aging is software rejuvenation. Software rejuvenation is a proactive fault management technique aimed at cleaning up the system internal state to prevent the occurrence of more severe crash failures in the future [13]. This process removes the accumulated errors and