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An Improved Load Balancing Algorithm of Multi-TPM

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Abstract

This paper have accomplished Trusted Platform Module test and have succeeded in porting TPM Emulator from Linux to Windows. According to the TLBA Algorithm, this paper proposes an improved load balancing algorithm of TPM (A-TLBA). A-TLBA makes further optimization and perfection to TLBA. It reflects in the choice of the threshold and considered the heterogeneous environment. A-TLBA improves the efficiency of TPM, reduces the waste of resources effectively and increases the robustness of the algorithm.

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Keywords: Load balancing; Multi-TPM; TPM Emulator;

1. Introduction

With the development of information technology, information security becomes the focus of attention. In order to solve insecurity issues of computer and network structure and improve the security, it gives rise to the basic idea of trusted computing. Trusted Platform Module (TPM) is able to provide protection for platform when computer is starting ^[1]. Trusted Platform chip provides limited resources and performs inefficient. TPM has a heavy task under the condition of multi-system and multi-task. With the appearance of multi-TPM, this paper analysis the potential load imbalance issues between each multi-trusted platform module (multi-TPM) and proposes an improved load balancing algorithm (A-TLBA)

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based on TLBA algorithm. A-TLBA algorithm provides better than TLBA algorithm of load balance and efficiency.

2. The porting of vTPM

TPM Emulator is open source software for simulating a TPM chip. It meets the specification of TPM, and simulates the features provided by TPM chip. At the stage of the development of trusted computing, TPM Emulator has a great significance for TPM and the upper application development based on TPM [2].

Currently, TPM Emulator can only work on Linux, but the operating environment of Windows has a significant advantage. From the application of trusted computing point of view, TPM Emulator has an extremely wide application background when it works in Windows. For these reasons, the work of TPM Emulator porting to Windows is necessary. Beijing University of Technology have succeeded in porting TPM Emulator from Linux to Windows. The porting operation is as follows. First, it should port the GMP.GMP provides the underlying support for the cryptographic algorithms of TPM Emulator. Second, it replaces the TPM Emulator source code which is not compatible with Windows platforms. Finally, it writes a program to test the function of TPM [3]. The design of the local test model is shown in Figure 1 [3]. A specific process of local test model is shown in Figure2 [3].

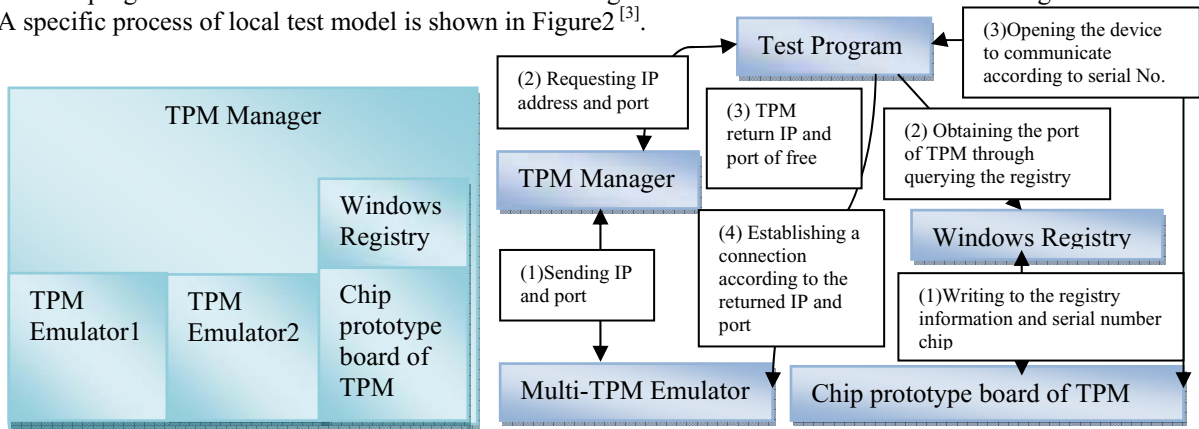


Fig1 The design of the local test model

Fig2 The detail design of local test model

This paper have achieved multi-vTPM module using virtual technology and have succeeded in transplanting from Linux to Windows. Furthermore, we have designed TPM test programs which guarantee the accuracy of operations in windows system and have finished the test command set. Based on above all, we propose an improved load balancing algorithm based on multi-TPM (A-TLBA).

3. Load balancing of multi-Tpm based on virtualization

Based on analysis of the TLBA, the paper puts forward the following two improvements: firstly, the divided of threshold has to be more discrimination. Secondly, the algorithm needs to consider the case of heterogeneous cluster. According to the TLBA algorithm, this paper analysis and improves TLBA algorithm, and proposes an improved load balancing algorithm based on TPM (A-TLBA).The following describes the specific A-TLBA algorithm improvements.

3.1. Transfer Policy

Threshold is a buffer mechanism for slow down the node load balancing activity. It makes the load balancing activity to carry out load balancing operation only under the relative deterioration of the system

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