

Verifying a Virtual Component Interface-based PCI Bus Wrapper with FormalCheck

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Abstract

The Virtual Sockets Interface Alliance (VSIA) recently released the Virtual Component Interface (VCI) Standard. This paper reports recent experiences in formally verifying a few properties of a VCI-compliant PCI 2.1 bus wrapper model in the formal verification tool, FormalCheck. Though we chose to only verify three liveness properties and three safety properties, the verification highlighted issues buried deeply within the model, quickly. We found eight issues in our model in four person-weeks of verification effort.

1 Introduction

The Virtual Sockets Interface Alliance (VSIA) recently released the Virtual Component Interface (VCI) Standard [Gro00]. The VCI is designed to allow compliant virtual components to communicate with one another easily, even if developed in different design organizations. Communication may take place via the VCI directly, or over an integrator-selected bus, via VCI-compliant bus wrappers, such as the one we modeled and verified in this case study.

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