Title	Study on Reliable Evaluation of Dynamic Routing Protocols and eID System Using Event-B and Formal Method(Abstract_論文要旨)
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Citation	
Issue Date	2017-03
URL	http://hdl.handle.net/20.500.12000/36490
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Abstract

Title: Study on Reliable Evaluation of Dynamic Routing Protocols and eID System Using Event-B and Formal Method. (Event-Bと形式手法を用いたダイナミックルーティングプロトコルと電子IDシステムの信頼性評価に関する研究)

The goal of this thesis is to analyze message passing in dynamic routing with the use of formal methods. Nowadays, one of the core research themes in a constantly growing distributed environment is the improvement of the communication process. The responsibility for proper verification becomes crucial. Formal methods can play an essential role in the development and testing of systems. This thesis presents two different methodologies for assessing correctness. Our first approach employs abstract interpretation techniques for creating a trace-based model for protocols in dynamic routing and message passing. The models were used for building a semi decidable procedure for verifying the system model. We also define the network addresses in the OSI model network layer at which routers are operating.

Network layer routes data from one node to another and determines the best path to the destination. Also, the network layer of the OSI model is used to provide a hop to hop address for the system that a packet can be routed to across several layer 2 switches (Ethernet, Token Ring, Frame Relay, etc.). Furthermore, the network layer addresses can also be referred to as logical addresses. Some software manufacturers, such as Novell, developed proprietary layer 3 addressing; however, the network industry has progressed to the point that common routers of layer 3 addressing system are necessary. The Internet Protocol addresses make all networks and networking easier to connect one with another. The Internet uses IP addressing to provide connectivity to millions of networks around the world.

Here we are implementing Dynamic Routing protocols with GNS3 and generating codes for verification of message passing and routing with Event-B and formal methods. Event-B is a set of formal methods for system level analyses and modeling. The main features of Event-B are the use of set theory as a modelling notation, the use of refinement to represent systems at different abstraction levels, and the use of mathematical proof to verify consistency between refinement levels.

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