Network Learning System using Software Router and Network Simulator

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Research Topics

- Router model using a click modular router
- Interface between an NS3 network simulator and a learning system

Research Seeds

When students learn network technology, exercises are effective to understand the knowledge learned during lectures. However, experimental systems using hardware equipment are expensive for fundamental network exercises. This study implements fundamental network exercises on a low-cost PC by combining a software router "Click Modular Router (Click)" and a network simulator "Network Simulator 3 (NS3)."

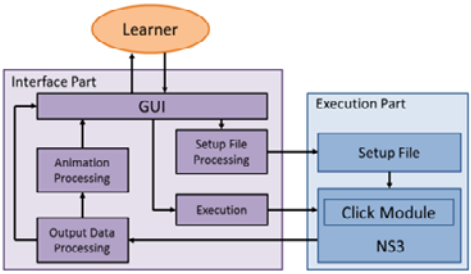

Fig. 1 Overview of Network Learning System.

An overview of the proposed network learning system is shown in Fig. 1. The system comprises an execution part and an interface part. When a learner inputs setup information of an exercise, the interface part generates setup files of the Click router using the setup information and the predefined configuration information. The NS3 program of the execution part simulates the exercise model by interpreting the setup file using Click modules. At the end of simulation, the interface part generates the output data from the trace result of simulation, and presents the result to the learner. A simple animation is also made from output data to show the network behavior visually to the learner.

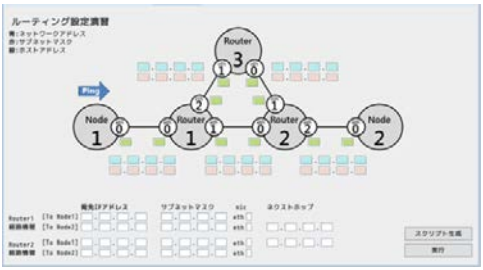

Fig. 2 Input Window of Static Routing Exercise.

We have implemented a prototype and a simple static routing exercise. Fig. 2 shows the input window of the exercise.

Related Technology

- Internet
- Software router
- Computer-based training