Flexible and real-time remote laboratory architecture based on Node. js server

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Abstract :

An advanced software/hardware flexible and realtime INTernational-REmote-LABoratory (INT-RE-LAB) architecture is presented in this paper. The INT-RE-LAB is developed and localized in four different host universities. The software part is based on the use of a free license server Node.js written in JavaScript. It offers lightweight Html/JavaScript clients. The integration of socket.io module enables a real-time operation mode of this Client/Server communication. Associated with hardware architecture, collaborative remote handling of resources is enable in the same way as a chat communication used in Internet. Each remote action performed by one user is instantaneously visible in other users'web interfaces. The hardware part includes a mini-computer that executes node.js server and hosts Mysql. Mini-computer "Pcduino" directly controls specifically developed relays circuits. These circuits offer the required flexibility and reusability for current remote laboratories. Different redundant remote practical works integrate the INT-RE-LAB have been developed for the new EOLES "Electronics and Optic e-Learning for Embedded Systems" bachelor.