SmartJS: Automated Runtime System and Middleware for Next-Generation IoT Systems

Mohammad Rafiuzzaman, Julien Gascon-Samson, and Karthik Pattabiraman
Department of Electrical and Computer Engineering, University of British Columbia, Canada

Motivation

SmartJS: a rich Javascript-based self-adaptable runtime environment which features a universal programming API, a comprehensive monitoring framework and an ubiquitous communication substrate for engineering and developing dependable, scalable, adaptable large-scale IoT systems.

Traditional IoT vs SmartJS

SmartJS Manager

Physical Constraints

Logical Constraints

Component Declaration

SmartJS Device Declaration

Component Declaration (sensor1, sensor2, actuator1, actuator2, regulator)

SmartJS App Source Code (Node.js)

Component: Sensor.js

Component: Actuator.js

Component: Regulator.js

Constraints Hierarchy and Code Migration

System Architecture

Writing a SmartJS Application

Publish-Subscribe Paradigm

Researchers

Mohammed Rafiuzzaman is a Ph.D. Student in the Electrical and Computer Engineering Department of the University of British Columbia, under the advisement of Dr Karthik Pattabiraman / rafiuzzaman@ece.ubc.ca

Julien Gascon-Samson is a NSERC Post-Doctoral Fellow in the Department of Electrical and Computer Engineering of the University of British Columbia, under the advisement of Dr Karthik Pattabiraman / www.juliengs.com

Dr Karthik Pattabiraman is a professor in the Department of Electrical and Computer Engineering of the University of British Columbia / blogs.ubc.ca/karthik

Publishers

Subscribers

smartsensor/temperature

actuator1

smartsensor/actuation

actuator2

regulator1

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