

From SMS to AWS. IoT control technology selection

The report examines the problem of optimal selection of the monitoring and control technology for Internet of Things (IoT) infrastructure in context of dedicated task. As widely known example we consider a task of the monitoring and control of the data center infrastructure or street telecom cabinet (19 inch euro mechanics). The system under consideration should provide following basic features: remote switching on/off of the servers or telecommunication equipment; microclimate sensors (temperature, humidity) and electric meter data collection; logging of the alarms; sending the alarm messages in real time. If considered IoT system used for many objects, requirements to its functionality increase. In this case new requirements for modern control system are: WEB user interface, controllers/sensors availability control, event logging, automatic software update, settings backup and security subsystem.

For the formulated problem we consider different approaches to build up system using: server or serverless solutions, off-the-shelf SW products (e.g. SCADA), IoT platforms or own SW development based on open source subsystems. For every approach we highlight pros and cons in terms of complexity of development and deployment, cost, reliability and security, as well as long-term exploitation cost.

We tried to convert the problem of optimal IoT control technology selection into multi-criteria optimization task. Incorrect choice of criteria and their weights, in particular, due to a neglect of the context of implementation, can lead to a significant cost increase and/or function decrease. Based on the analysis made we have developed an algorithm for IoT control technology selection. This algorithm allows making balanced choice based on different system deployment factors.

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