

Easy-build wireless networks

January 18 2010



(PhysOrg.com) -- Networks that monitor life-threatening situations or improve environmental efficiencies will be easier and cheaper to develop and operate, following the creation of a single middleware solution for the entire spectrum of wireless standards.

In Hungary a trial group suffering from chronic diabetes is able to test their [blood glucose](#) content with a sensor connected by Bluetooth to a mobile phone. An application on the phone automatically forwards the data to a newly developed MORE middleware on a central server. If the glucose levels are poor, the middleware can send advice to the patient, it can notify doctors and nurses, or - where there is extreme danger - it can automatically call an ambulance.

MORE was built by a consortium of research institutes and stands for 'Network-centric middleware for group communications and resource

sharing across heterogeneous embedded systems’.

A forestry institute in Dresden is monitoring the threat of forest fires using moisture sensors placed in the soil in remote areas. Via MORE middleware, researchers and forestry professionals can access sensor data from their desktop PCs. But where conditions are critical, the middleware will dynamically send out alarms to a wider group, including emergency services.

Monitoring networks can deliver huge savings and environmental benefits. The efficiency of all kinds of machinery and systems can be constantly checked and maintained. Real-time monitoring enables servicing to be reduced and optimised. The system operators can be proactive rather than reactive.

Unifying all approaches

Creating networks that share data across very different communications technology standards can be very costly and time consuming. There are vast numbers of wireless sensors and other embedded systems. Many of them have their own operating systems, programming languages, and hardware peculiarities. Network developers had to write customised software to enable data sharing.

The EU-funded MORE overcomes this because it is a single middleware platform that supports the complete spectrum of sensor platforms, making network creation quicker and easier.

“There are several competing middleware platforms all trying to overcome the heterogeneity of wireless communications”, explains MORE’s project coordinator Stefan Michaelis, from PRO DV Software AG in Dortmund. “But most have concentrated on one area: perhaps broadband wireless communications, wide area communications, or

short-range communications. We tried to unify all the approaches.

“When you use the MORE middleware you can use standard components. There are very few parts that you need to implement on your own, other than the communication protocol with your sensor.”

MORE is designed to cope with the limitations of embedded systems, such as wireless sensors. Sensors often run on batteries that cannot be replaced very often. They could not sustain the power-heavy and data-heavy receipt and transmission of data required by SOAP-based web services on the internet, where SOAP stands for service-oriented architecture protocol.

SOAP lite

To tackle this problem, some sensor developers have compressed the XML payload of the messages to reduce the amount of data to be transmitted over the communication channel. But this approach was not sufficient for the level of communication required by MORE. Instead, the MORE team developed a proxy service called μ SOA (pronounced ‘microSOA’). This proxy service transcodes SOAP messages into purged binary μ SOA messages, greatly reducing the support data (overhead) required on the communication channel.

“You can keep a single service as light as possible and if you need extended functionality and more sophisticated services you can use a ‘chaining’ facility to combine services into one large service that provides more functionality without the need to implement a complete new service,” explains Michaelis.

A single platform that supports the complete spectrum of [sensors](#) should also make it easier for sensor developers to update their products. They will no longer have to consider the complete software tool chain for

transferring data from the sensor to human beings.

The Hungarian clinical study testing the effectiveness of the MORE approach with diabetes patients is in its last stages. Should it prove successful, it will be the first MORE-based product on the market. MORE software has been released as open source, freely available in its basic version for anyone trying to build a monitoring network.

The MORE project received funding from the ICT strand of the Sixth Framework Programme for research.

More information: MORE project -- www.ist-more.org/

Provided by ICT Results

Citation: Easy-build wireless networks (2010, January 18) retrieved 25 April 2024 from <https://phys.org/news/2010-01-easy-build-wireless-networks.html>

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