M2M Solutions

from

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INTRODUCTION

MACHINE TO MACHINE

M2M is about enabling the flow of data between machines and machines and ultimately machines and people. Regardless of the type of machine or data, information usually flows in the same general way -- from a machine over a network, and then through a gateway to a system where it can be reviewed and acted on.

Within that basic framework, there are many different choices to make such as how the machine is connected, what type of communication is used, and how the data is used. Even though it can be complex, once a company knows what it wants to do with the data, the options for setting up the application are usually straightforward.

When it comes to the finer points of machine to machine communication, every deployment is unique. However, there are four basic stages that are common to just about every M2M application. Those components are:

- 1) Collection of data
- 2) Transmission of selected data through a communication network
- 3) Assessment of the data
- 4) Response to the available information

1) Collection of Data

The intelligence of a monitored machine may be as simple as a temperature sensor, level indicator or contact closure, or it may be an industrial computer system with a Modbus communication port.

The process of M2M communication begins with taking data out of a machine so that it can be analyzed and sent over a network. Monitoring a "dumb" machine may mean directly connecting to and monitoring one or more limit switches, contact closures or analog outputs. With an intelligent electronic device, it may be possible to simply connect to the equipment's serial port and ask for the data.

The goal of the M2M hardware is to bridge the intelligence in the machine with the communication network.

An intelligent wireless data module is physically integrated with the monitored machine and programmed to understand the machine's protocol (the way it sends and receives data).

If the monitored machine is configured as an intelligent master device, it may treat the M2M device as a simple wireless modem, loading it up with data and then instructing it to transmit that data to the network. If the machine is just a collection of switches and sensors or is an intelligent slave device, the M2M device can act as the master device. In this mode, it takes

charge by periodically polling the device by reading the sensors and switches or by sending data requests through the serial port.

In a high end application like a major electric utility substation, it may be necessary to send a constant stream of real time data describing the machine or process. But in many cases, this is not necessary or worth the cost. In these cases, the M2M device should minimize the amount of data to be sent by constantly reviewing the data, comparing it against programmable alarm limits or setpoints, and then only transmitting real time information when a reading is out-of-limits.

In addition the application will typically be programmed to send complete data updates on a time scheduled basis or anytime upon request from the web server.

2) Transmission of data through a communication network

There are several good options for transporting data from the remote equipment to the network operation center. The cellular network, telephone lines, and communication satellites are all common solutions.

The telephone may be the best choice if a line is already installed and the cost can be shared with other uses. Its disadvantage is usually the ongoing monthly cost and sometimes the cost and difficulty of installation.

Satellite may be the most expensive solution, but is often the best or only solution for monitoring equipment in very remote areas.

The wide spread coverage of the cellular network is the main reason M2M is getting so much attention these days, and it's usually the method that fits best. There are several methods of sending data over the cellular network. CDMA and GPRS are both widespread in North America today and their coverage areas continue to grow. The advantage of these systems is the ability to send large amounts of data frequently. The costs continue to drop.

Connecting to the cellular or satellite network typically requires the use of a gateway. A gateway receives the data from the wireless communication network and converts it so that it can be sent to the network operation center, often over the Internet or by a frame relay (phone line) connection. Data security features such as authentication and access control can be managed by the gateway and the application software.

The gateway also has an important role when the flow of data is reversed, going from a network to the machine for data requests and remote control. The gateway still functions as a protocol converter, but this time it takes high-bandwidth Internet protocols and converts them to low-bandwidth wireless protocols so the data is optimized for transfer over a cellular network.

For companies deploying an M2M application, the gateway, the application software, and the data warehouse can be housed internally or can be hosted by a third party in a network operations center. In many cases, the hosted model may be more attractive because of the high cost involved in setting up the infrastructure and managing the network. Since the upfront cost is often lower with the hosted model, the payback can be faster and the solution can be deployed in less time.

3) Assessment of the data

Data from a company's networked machines usually shows up in one of two places: in an enterprise software application the company already uses, or in a standalone system designed specifically for M2M.

Today's deployments tend to favor standalone systems for applications such as remote monitoring because most M2M application providers specialize in providing these and there can be additional costs involved with integrating new data into existing systems.

Still, the vast majority of opportunities for M2M center around taking data out of machines and integrating it with operational data. For example, remote monitoring data can be incorporated into customer-relationship management systems for logging service and maintenance history.

4) Response to the available information

Whether the application is standalone or part of a larger system, the common goal is to automate a business process by automating the flow of data to the people and systems that have a need to know. The technology should enable sending the right data to the right place in the right way depending on the circumstances. It should also present data to individual users based on their specific function in the business process. For example, an HVAC system monitor might e-mail a routine maintenance request for an adjustment or lubrication to Siegfred and an emergency voice call for a thrown belt or tripped breaker to Roy.

A modern farmer who has automated irrigation systems operating in different locations can now be constantly aware of their operation based on short messages that are relayed to his pager or cell phone.

Of course, none of this technology is specific to M2M; the whole purpose of business software is to keep people from having to do everything manually. The new element that M2M brings to the picture is that now companies have new data to work with, data that is central to the way they operate and the value they provide.

PROJECT:

Our company opens new doors to the world of data-collecting and processing with our newly developed complex communication system. Web and AVR based machine to people (M2P) communication, and service. New technologies ATMEL AVR and GPRS modem board can collect data from any machine, for example car wash machine, houses, cars, pc's , building machine, coffee and cash machines.. We has developed a multi-protocol for any machine and for data logging. This board collects the data and under a programmed period you can send it to the data server. The customers can see online how the machine is working, making graph,s etc. If needed, the customer can control this machines from their home, office via pc or mobile phone.

Vending machine solution:

With the data collecting system we don't have to choose or categorize in the used area. In this way we can talk about beverage, food, condome or coffee machines. Bussinesswise, on the other hand coffee machines have a priority, according to world-wide marketing statistics these machines' coffee sales are the strongest.

Tech and service:

With the help of the built-in electronics we can collect data to all visible points of sensor device. These count the cups, money transaction and the daily profit. The water temperature and fluids are also measured in this way. Collects and values errors. All information is sent through GPRS links to a central database where they are stored and can be reached by the servicer, owner, repair personel through internet or mobile phone according to user rights (User, supervisor, service). On site evaluation gives the servicer immediate information on the machines status, provides great help concerning maintenance. Provides logistic help to the personel dealing with filling of these machines, stores date of fill and keeps track of fillers id.. Helps with commission accounting system. Last but not least , sends an immediate alarm to the owner or competant personel in case of external attack (robbery/vandalism).

Machine side:

- Error processing
- Water temp. supervision
- Cup count
- Fluid level
- Daily cash flow
- Robbery/vandalism: immediate sms, email and WEB notice

Server side:

- Hourly vital signs
- Daily-weekly statistics
- Keeps data for several years
- User and service id. (fill and repair)
- Error status supervision
- Fill logging statistics
- Logistics- to service

Price account system:

The price of electronics put into a machine depends highly on the amount of sensors used as well as the type and number of machines. Done through individual contract basis. This amount per machine varies between 60-220 (USD) .Web interface and mobile phone service displays 1cent/cup, the service can be seen in English, Spanish, German and Hungarian languages.

We do individual unique system for you! Be the first on the M2M market!

wStudio
Barnabas Gondi
email: barnabas@wstudio