Writing Apps for the SmartServer
Creating Custom Energy Management Solutions

May 12, 2011
11:00AM – 12:00PM
PUSHING CONTROL TO THE EDGE

Energy Control Network

“Push Control to the Edge”

Sense and Act to Drive 100% Reliability

Analyze and Share Relevant Information

Local, Real-Time, Autonomous Decisions

Open Apps Platform to Add Smart Applications

RELIABLE

SUSTAINABLE

INSTANTANEOUS

OPEN ECHELON
ECHELON ENERGY CONTROL SYSTEM

Three-Tier Architecture

- 100% Reliable
- 100% Survivable
- 0 Latency

All Powered by Echelon Energy Control Software
Smart energy manager

- Interact with all your devices
- Provide interactive and timely information
- Interact with all your enterprise applications
  - Centralized management of energy use
  - Centralized monitoring and control
  - Grid-aware buildings, remote assets, and systems

Key enterprise energy management device
• Open up new markets with new capabilities
• Generate revenue by selling custom applications and drivers
• Differentiate your business with value-added apps
• Customize the SmartServer to meet your specific needs
• Data points for all busses are abstracted using LONMARK types and resource files

• Provides consistent, strongly typed interface for:
  - LON
  - M-Bus
  - ModBus
  - Custom drivers
  - SOAP interface
A custom app runs on a virtual device
  - App users can load new apps without programming
  - Custom app developer just provides app plus XIF file and resource file set

A custom app can have a custom configuration Web page
  - Similar to a plug-in, the custom configuration Web page makes the app easier to configure
Each LonWorks virtual device has up to:
- 4096 NVs
- 4096 NV aliases
- 4096 address table entries
- 256 simultaneous transactions

Layers 1 – 2

Layers 3 – 7
VIRTUAL LON DEVICE

Apps (one per type)

LONMARK resource file set defines data point functionality for each block

Select a XIF file for each local device

Data (Point) Server

Abstraction Layer

LonMark Functional Profile: Entry/Exit Device

Block definitions

Datapoints (static, dynamic)

Virtual Neuron (030000aaabb2)

Virtual Neuron (030000aaabb3)
COPY RESOURCE FILE SET TO THE SMARTSERVER
DEFINE THE NEW DEVICE ON THE SMARTSERVER

- Select one of 10 virtual devices and select a template or XIF file
- SmartServer creates the virtual device and all its static and dynamic NVs
• SmartServer maps the datapoints to the proper instance of the block
Datapoints are automatically declared after the functional block has been imported.
WRITE THE REST OF THE APP

```c
void CMathTest::Work()
{
    int x = int * int;
}

void CMathTest::OnTimer()
{
    // This is the default timer callback. If 'CreateTimer()' was used in Initialize()
    // the timer-calls end up here. If more than one timer was defined, the timer of concern
    // can be identified by utilizing the 'TimerExpired()' method;
    //
    // if (TimerExpired( nTimer1 ) )
    //    ...
    //
    void CMathTest::OnMyTimer()
    //
    // This is a couple for a user defined timer callback. If 'CREATE_TIMER()' was used in Initialize()
    // the timer-calls end up here. If more than one timer was defined, the timer of concern
    // can be identified by utilizing the 'TimerExpired()' method;
    //
    // if (TimerExpired( nTimer2 ) )
    //    ...
    //
    //void CMathTest::OnMyTimer();
}
```

No console to display at this time.
BUILD THE APP

```c++
// MathTest.cpp

void MathTest::Work()
{
    int result = int(5 + 2);
    // Additional code...
}

void MathTest::OnTimer()
{
    // Timer callback code...
}

void MathTest::OnError()
{
    // Error handling code...
}
```

Build complete for project 0FFFFFF000000000[3].UPFMath
TRANSFER APP TO SMARTSERVER

FTP-Site Settings
Specify remote site server address, logon information, destination folder.

- **Host:** 172.25.132.7
- **User:** ilon
- **Password:** 
- **Destination Dir:** /modules
- **Reboot:** [ ]
- **Web Port:** 80
- **Etp Port:** 21
- **Passive Mode:** [ ]

If you can connect to the i.LON SmartServer but you have difficulties to setup a file transfer, you should enable passive mode.

< Back | Next > | Finish | Cancel

Building target: Mathtest.app
Invoking: linker
`ccmpas -e -nostdlib -Wl,-XX,-Wl,-X -o Mathtest.app -c Mathtest.s ./Mathtest.s ./Mathtest_utils.s stdt.o`,
- `C:\iLon\Nethoriginal\Development\eclipse\plugins\com.iLon.eclipse.1000\mpp 0.9.0\compiler\vsworks-6.2\target\b\tool\gnu\ldscripts\link.OUT`

Finished building target: Mathtest.app
Build complete for project 

```
/8FFFE000000000[3].UFPTmath
```
APP STARTS AUTOMATICALLY
A shift is occurring, creating new demands from “plant-to-plug”

Creating a need to push control to the edge

The answer: Echelon Energy Control Network and SmartServer

Why ECHELON

- Smart, fast local decisions
- Bullet-proof reliability
- Orchestration and management

- Relevant information
- Infinite applications