

Development of MTConnect® Agent and Client for SCADA Framework Application

Overview

This case study describes a solution that we provided to a SCADA product owner to support MTConnect®(<http://www.mtconnect.org/>)in their product.

MTConnect® is an upcoming new standard for communicating data in manufacturing and Machine Tools industry. The standard is getting very popular these days because it is based on an open protocol and uses the state-of-the-art, web-based technologies like REST/XML/HTTP. It is seen as having a good potential to become one of the key data integration standards.

Problem

The customer is a leading SCADA software vendor based in Texas,US.They have a framework that can be used to create customized SCADA applications that cater to various industries.

The product supports a variety of communication protocols to read data from various industrial devices. These include OPC, OPC-DA, Modbus, custom protocols for PLCs like Allen-Bradley, Siemens, etc. The application also allows data integration to the external world through a variety of interfaces on OPC and TCP/IP.

The customer wanted to have their SCADA product enabled with the MTConnect support for data integration with external systems.TA partnered with them to develop this feature.

The data integration requirement had two parts:

1. To be able to read tag data in the SCADA database from external MTConnect clients,and
2. To be able to share the tag data from the SCADA database to the external world through MTConnect interface.

Key Points

1. The customer owns a SCADA framework product that can be used to create customized SCADA solutions .
2. The customer wanted to include support for MTConnect® in their SCADA product to help its integration to a wider set of applications.
3. MTConnect is a new standard for data acquisition that is getting popular in manufacturing and Machine Tools industry .

Tools/ Technologies

1. Microsoft® Visual Studio.Net

2. C#, C++, HTTP/XML
3. REST
4. LDAP

MTConnect Commands

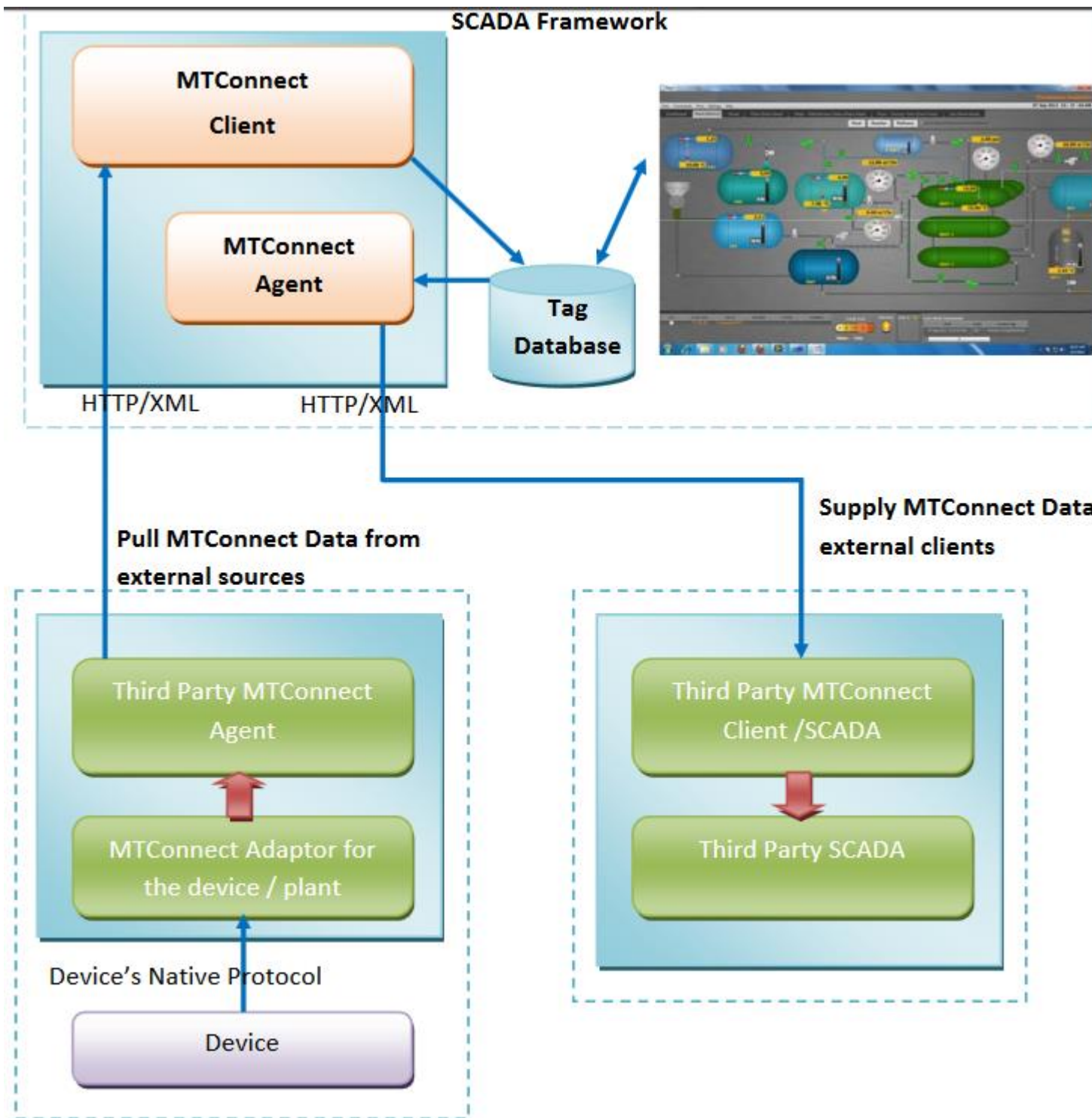
- Probe
- Current
- Assets
- Sample

Benefits

- Early adoption of an upcoming standard.
- The customer's SCADA software can now read data from an external MTConnect Agent.
- The software can also supply data to an external MTConnect Client.

Solution Architecture

The following figure shows the architecture of the system.



The two modules, MT Connect Agent and MTConnect Client as part of the SCADA Framework were developed by TA's team.

MTConnect Client module connects to third party agents through HTTP/XML after discovering it through an LDAP based Name Service. Subsequently, the meta-data about the tags available from the third party agents will be available using a 'Probe' command as specified by MTConnect. Once the tag information is available, the client can get the actual data using sample and 'Current' commands specified by MTConnect. The tag information and the actual data are integrated to the SCADA's master database.

The MTConnect Agent module that we developed makes the tag data from the SCADA applications database available to the external world. The agent supports the major MTConnect commands, 'Probe', 'Sample' and 'Current'.

Other features added to the SCADA framework

In addition to adding support for MTConnect, we provided the following development support for the same SCADA product.

- Direct-X based drawing tools to avoid aliasing errors.
- Support for developing communication driver modules(TCP/IP and RS 232)for new devices.
- Support for tag integration from different devices.

Conclusion

TeamTA has successfully demonstrated that we can be a long term development partner to an Independent Software Vendor (ISV) in the field of industrial automation. Our technically savvy and passionate team can provide immense value addition to the customers with our skills and expertise in state-of-the-art technologies. The following are our value propositions:

- Product Development engagements for OEM customers.
- Work in close association with product managers and other customer team members .
- Agile development methods to adapt to changing market needs .